The Pharmaceutical Journal

AND

Transactions.

THIRD SERIES.

VOLUME VIII.

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Transactions.

VOL. VIII.—JULY 7, 1877.

NOTE ON THE DISTRIBUTION OF THE ALKALOIDS IN CINCHONA TREES.

BY DAVID HOWARD, F.C.S.

In the *Pharmaceutical Journal* of June 26, 1875, I called attention to the constant presence of quinidine in renewed bark of *Cinchona succirubra* and *C. officinalis*, and in the root bark of *C. officinalis*, in much greater quantities than in the natural stem bark. Since that time I have had many opportunities of confirming those observations, the renewed bark of both species invariably showing a greatly increased percentage of this alkaloid. I find, however, that by very careful testing of considerable quantities of the alkaloid from the *C. succirubra* it is possible to obtain quinidine in quantities from a minute trace to ·06 per cent. of the bark in that from Ootacamund, Darjeeling, and Java.

Recent importations of the root bark of *C. succirubra* and *C. officinalis*, from Darjeeling, and of *C. succirubra*, *C. Ledgeriana*, and *C. Hasskarliana*, from Java, have given an opportunity to extend our knowledge of root bark. The specimens from Darjeeling are of special value, as the root, stem, and branch bark sent over together may safely be taken as representing the produce of the same trees, whereas we have no information as to which of the various parcels of stem bark sent from Java the small quantities of root bark sent with them belong.

In examining the root bark from Darjeeling we are at once struck by the high percentage of alkaloids, which is in all cases much greater than that given by the stem bark of the same trees, usually in the proportion of about eight to five, and by the great difference in the proportion of the different alkaloids in the stem and the root.

In all the specimens that I have examined of the *C. succirubra*, the great increase is in the dextrogyrate alkaloids, quinidine and cinchonine, and to a small extent in the slightly dextrogyrate amorphous alkaloid. The percentage of quinine and cinchonidine in the bark averages slightly less in the root than in the stem, but more than in the branches; but the total variation in these alkaloids between the stem and root of the same tree is much less than between different samples of either from different plantations; the percentage of cinchonine, on the other hand, seems invariably in the root bark from twice to three times as great as that in the stem bark; and that of quinidine is increased from the minute quantity I have mentioned to ·2 to ·3 per cent.

The increase of the amorphous alkaloids is much smaller, being usually in the proportion of eleven to ten.

A comparison with the quill bark from the smaller branches shows even more decidedly this difference in the distribution of alkaloids. Not only do we find the total quantity of alkaloids much less than in the stem bark, but the proportion of the dextrogyrate alkaloids is distinctly less. One example will suffice to illustrate these remarks as well as the whole series, which all present similar variations; and I therefore add the percentage of alkaloids in the branch, stem, and root bark from one plantation, and the percentage composition of the alkaloid of each.

The composition of the alkaloid in the root fibre shows, as will be noticed, an even higher percentage of quinidine than that of the root bark. It is impossible to separate the bark from the wood in these small roots, which are from the thickness of a quill to a mere fibre, and therefore impossible also to give the percentage of alkaloids in the bark without the woody portion.

	Branch.	Stem.	Root.	Root Fibres.
Total alkaloid . . .	3·3	5·5	7·6	2·0
Composed of :—				
Quinine	23·5	20·2	11·5	13·0
Quinidine	·6	·6	2·9	11·4
Cinchonidine . . .	25·3	23·6	19·9	11·7
Cinchonine	19·4	32·8	47·3	46·7
Amorphous	31·2	22·8	18·4	17·2

The crown bark from Darjeeling is interesting both in its resemblance to and difference from the red bark. This species has not flourished there; a large proportion of the trees died, and those that survived were stunted and weakly. The stem bark is of fair quality, though far inferior to that grown at Ootacamund, yielding 3 to 4 per cent. of alkaloid, of which 60 per cent. is quinine, with small quantities of quinidine and cinchonine. The root bark contains about twice as much total alkaloid, of which 50 per cent. is quinine, 9 per cent. quinidine, 9 per cent. cinchonidine, and 16 per cent. cinchonine; the increase in the quinidine and cinchonine being even more marked than in the case of the succirubra.

The root barks from Java which I have examined of the *Cinchona succirubra*, *C. Ledgeriana*, and *C. Hasskarliana*, all show the same tendency to the development of the dextrogyrate alkaloids. As has been mentioned, we are not informed what stem bark belongs to the root bark sent over, but it is interesting to observe that in each case the root bark contains more of these alkaloids than any single specimen of stem bark of the same species, and greatly more than the average.

Thus, in the *C. Ledgeriana* the increase of alkaloid in the root is very slight, but the proportion of quinidine is doubled, and of cinchonine trebled, the amorphous alkaloid being also increased.

In the *Hasskarliana* the total alkaloid is decidedly increased, the proportionate increase of the dextrogyrate alkaloids being similar to that in the *Ledgeriana*. In both these species the quantity yielded of these alkaloids is but small, but the marked increase is not less interesting on that account. In the *C. succirubra*, also, the increased quantity of alkaloid in the root is chiefly cinchonine, the quinidine increasing from ·01 to ·05 per cent.

There has been no opportunity of comparing the root bark of the cinchonas from Ootacamund, for the great success which has attended the system of renewing the bark puts the destruction of the trees out of the question; but it is interesting to observe that the specimen of root bark from *C. officinalis* from this district, which I described in 1875, shows an increase in the dextrogyrate alkaloids equal to that in the *C. officinalis* from Darjeeling; there is also an increase in the quinine, but much less than in the Darjeeling bark.

A specimen of root and stem bark from the Wynaad district has reached me. In this case the total alkaloid is increased from 5·0 per cent. to 6·5 per cent., the quinine being diminished and the cinchonidine increased; but, as might be expected, the cinchonine is increased from 2·2 per cent. to 2·8 per cent., and the quinidine from a trace to ·3 per cent.

It seems, therefore, that there is an invariable tendency in the bark of the root of the various species of cinchona to produce the dextrogyrate alkaloids in greatly increased proportions, and this is the more noteworthy as the production of the lævogyrate alkaloids in the root bark varies exceedingly, according to the species and habitat, being sometimes greater and sometimes less than that in the stem bark of the same trees.

The same tendency is shown in a much slighter degree by a comparison of the bark of the branches with that of the large stems, the proportion of the cinchonine and quinidine increasing as we approach the root more rapidly than that of the quinine and cinchonidine; but it is not till we reach the root that we see the sudden and well-marked change in proportion of the alkaloids that we have been considering.

The constitution of the alkaloids of the renewed bark affords curious points, both of resemblance and contrast to that of the root. There is seen in the renewed bark also an increased yield of alkaloids, but in this case the increase of the more oxidized alkaloids, quinine and its isomers, is accompanied by a distinct diminution of cinchonine and cinchonidine.

This is most evident in the *C. succirubra*, the proportion of quinine and cinchonidine being inverted by the process, while the slight diminution of the cinchonine is accompanied by an increase of the quinidine from ·03 per cent. to ·14 per cent., but the same change takes place in the bark of the *C. officinalis*, where the cinchonidine almost disappears, and the quinidine is markedly increased in quantity, the amorphous alkaloid being in each species increased by the process.

The renewing of the bark has only been carried on as yet on the Neilgherries, but it is to be hoped that the great commercial success which has attended the experiment will lead to its adoption, if practicable, elsewhere, when we shall see if the modification of the alkaloid follows the same rule under all circumstances.

The variations shown by the *C. succirubra*, under the influence of climate and soil, are also very interesting. This species of cinchona alone seems to be sufficiently hardy to adapt itself to varied circumstances, growing alike at Darjeeling where the other species have proved almost total failures, in the Neilgherries where the climate seems the best suited for the *C. officinalis*, and in Java in the habitat so singularly favourable to the *C. Ledgeriana*.

The proportion of the alkaloids varies, however, very distinctly under these varied circumstances. Except under the artificial treatment of renewing the bark, it is never rich in quinine, but the cinchonidine and cinchonine show very interesting variations.

In Java the cinchonidine predominates in a most marked degree. On the Neilgherries, though cinchonidine is still predominant cinchonine shows an increase. On the Himalayas the bark shows a deminished yield of cinchonidine, but a marked increase of cinchonine and amorphous alkaloid.

Not having been able to get particulars of the various elevations at which bark is grown in Ceylon, I cannot speak with certainty as to the different specimens obtained from that island, but as far as I can judge, the bark from the lower elevations approximates nearly to that from Darjeeling, while the higher plantations give bark of similar characteristics to that from Ootacamund.

All these considerations point out the great care that should be exercised to choose suitable situations for cinchona plantations, as well as the importance of selecting the best species for cultivation. The experience of the plantations in Java shows that under the most favourable circumstances the wrong tree will not produce rich bark, and that of the Darjeeling plantations shows that the right tree in the wrong situation will either dwindle away or produce a distinctly inferior bark.

The result of cinchona cultivation at Darjeeling thus agrees with the experience earned in some districts of South America, somewhat similarly situated in too damp a climate at too low an elevation. There also, instead of the calisaya and micrantha barks, rich in quinine, of the higher slopes, we find what are either degenerate varieties or different species, in which cinchonine, and in some cases quinidine, take the place of quinine.

A vast proportion of the "flat yellow bark" now imported is from these regions, and though certainly flat and yellow, resembles in little else the flat calisaya bark of a few years back, and must certainly lead to disappointment if substituted in medicine for the true calisaya.

THE ACTIVE PRINCIPLES OF CALABAR BEAN.*

There is scarcely another modern drug which has been subjected to such frequent and exhaustive investigations as the seeds of *Physostigma venenosum*; but at the same time there is a surprising difference of views and theories in regard to its physiological action. All authors are agreed on *one* property of the drug, namely, that of contracting the pupil, but in all other respects they differ widely. Ever since Fraser's classical investigations (1863)

* From *New Remedies*, June, 1877.

it has been customary to regard the Calabar bean as a poison directly paralysing the spinal cord, and from this view arose its employment as a remedy in tetanus, where it was found (by Watson and others) to be so exceedingly effective that most other previously used remedies were henceforth discarded. But lately statements have been published, in reference to the action of the commercial extract of calabar and of "physostigmin," which would make their usefulness in tetanus appear exceedingly problematical. Rossbach and Nothnagel, for instance, assert that extract of calabar is not a paralysing but a tetanising poison, and the latter adds that it resembled strychnia in so far as its paralysing effect was a secondary symptom depending upon an exhaustion of nerves and muscles by preceding violent convulsions. Martin Damourette thought he had solved the problem by supposing that the drug excited the spinal marrow and paralysed the peripheral nerves. But such compromises, unsupported by evidence, are inadmissible in exact science, and Rossbach was unable to obtain any paralysing effects upon the peripheral nerve with Merck's physostigmin. It was left to chemistry to throw light upon these apparent discrepancies. Hitherto it had been supposed that calabar contained only *one* alkaloid, namely, physostigmia, as Hesse called it, or eserina, as Vé and Leven termed it. But, according to the researches of Harnack and Witkowsky, conducted in the pharmacological laboratory at Strassburg, Calabar bean contains *two* alkaloids, one of which entirely resembles strychnia in its effects, while the other produces the previously known central paralysis. The new alkaloid, named by the discoverers *calabarine* (calabaria), differs from physostigmia by its insolubility in ether, and easier solubility in water; it is also soluble in alcohol. A further difference is the fact that the precipitate produced by potassium iodohydrargyrate in calabarine solutions is insoluble in alcohol. The commercial preparations of calabar are, according to the same authorities, mixtures of the two alkaloids in varying proportions, and therefore produce such discordant effects. Whenever physostigmia preponderates, it appears to suppress the effects of calabarine; this fact explains why most investigators merely took notice of the paralysing effects. On the other hand, there are preparations in the market which scarcely contain any physostigmia at all, as was proved directly by Harnack and Witkowsky in the case of an English specimen. The purest commercial preparation was Duquesnel's eserine, which appears to be absolutely free from calabarine.

Since, therefore, commercial preparations of calabar may contain comparatively large percentages of calabarine, the administration of which is positively injurious and highly dangerous in tetanus, it is desirable to possess a means of control, or to employ preparations which make the presence of the dangerous alkaloid impossible. As the latter is absolutely insoluble in ether, it appears advisable to introduce, in place of the present officinal alcoholic extract of calabar, an ethereal extract, although the same drawback, which Hager points out as inherent to the officinal preparation, is not unlikely to attach to this, namely, a proneness to speedy deterioration. Indeed, physostigmia is very readily decomposed, with formation of Duquesnel's rubeserine, which appears to be formed not only under the influence of alkalies, but even spontaneously, as may be suspected from the change of colour observable in old Calabar beans. Duquesnel's eserine has an especial tendency towards this decomposition, according to Harnack and Witkowsky. But rubeserine cannot contaminate the ethereal extract prepared from the beans, since it is insoluble in ether. (*Pharm. Zeit.*, 1877, Nos. 16, 30.)

In No. 21 of the same serial we find a communication by O. Hesse, commenting on the above article, in which he states that he has succeeded in extracting from Calabar beans a substance crystallizing from alcohol in probably the same form as the so-called crystallized eserine, and appearing to be a much more definite and stable substance than the latter. It crystallizes from ether, chloroform, and petroleum-ether in white silky needles, melts at 133–134° C., is indifferent, and greatly resembles cholesterin and iso-cholesterin in appearance, though not in properties or composition. Hesse also adds that the substitution of an ethereal instead of an alcoholic extract would be of but little use, as Calabar beans contain physostigmia in such a combination that it appears insoluble in and incapable of extraction by pure ether.

The well-known manufacturing chemist, E. Merck, in Darmstadt, has heretofore prepared and sold a substance which was supposed to be the only active principle of calabar, and which he called calabarine, but which was really eserine or physostigmine. He now accepts and confirms the results of Harnack's and Witkowsky's researches, and has put both of the active principles upon the market labelled with their correct names, namely, "*physostigmin*" (or eserine, being the same substance which he formerly sold as calabarine), and "*calabarin*," distinguished by the addition of Harnack's name ("Harnack's calabarin"). *The attention of physicians and pharmacists is particularly directed to this change of appellations.*

CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting of assistants was held in connection with the above on June 28, at 17, Bloomsbury Square. Mr. A. W. Postans occupied the chair.

The Hon. Secretary pro. tem. read the following report from the Preliminary Committee.

"Gentlemen—The Committee have reason to congratulate the supporters of the movement on their success hitherto. It is only about two months since the projectors determined to put their idea into a practical form by founding a Chemists' Assistants' Association. Donations to defray expenses have been received from eighty-two gentlemen amounting to £10 12*s.* 6*d.* The balance sheet shows the amount in hand to be £3 13*s.* 8*d.*, but this is not the actual state of the fund; there are debts to pay off, viz.: Messrs. Lockwood's account and the reporter.

"The Committee have met several times and considered various ways of rendering the new association a success; the resolutions to be proposed, and the rules, copies of which have been distributed, will clearly show what the promoters wish to do.

"Nearly 1000 circulars have been distributed containing a request for opinions and suggestions to be sent to the Hon. Secretary. Very few replies have been received, but such as have come in have received due consideration by the Committee. Letters of invitation to this meeting have been sent to the principal chemists; replies have been received from several expressing regret that they are unable to attend, and wishing success to the undertaking."

The Secretary announced that Mr. John Williams, President of the Pharmaceutical Society, had forwarded a cheque towards the funds of the Association.

The Chairman in the course of his introductory remarks said the meeting that evening was one of unusual interest and pleasure, and also for congratulation specially to the committee and honorary secretary, who had so persevered in the preliminaries of organization as to steer the ship safely at last into the time-honoured Lecture Theatre of the Pharmaceutical Society. He advised the members to avoid all reference to or interference with the early closing movement, and to banish trades unionism entirely from their debates. In order to do young men good, it was necessary to bring them together and make them feel their desires and wishes to be one—and this new society would by its social gatherings help on and develop good work. He considered the meetings of the Pharmaceutical Society all that could be desired in their way, but knew that after business, assistants liked to be away from employers and have a little society of their own to feel free from restraint. He referred to an association which had existed about eleven years ago, supported by gentlemen from Messrs. Bell's, Corbyn's, Allen's, Savory's, Morson's, etc., from whose meetings much good had resulted, although conducted under great disadvantages. How much more might be done by the new association, which he trusted would have the support of all employers. He told those present that the meeting was intended to give them, one and all, an opportunity to express their opinions, and to simplify matters he drew their attention to several points he thought they should discuss. He suggested that some of their meetings should if possible be held at Bloomsbury, that their rooms should be supplied with daily papers, and the refreshments be confined to tea and coffee.

Mr. Biddiscombe thought that all assistants had at one time or another felt the want of a meeting place, especially during their weekly or bi-weekly relaxations from their duties. He had long been interested in the matter, and tried some two years ago to establish an association similar to the one now proposed. Numerous obstacles had presented themselves, and objections had been raised as to its usefulness. One objection was that there was no need for it, as the Pharmaceutical Society supplied all the wants that assistants ought to feel; another that London assistants were so migratory. These he trusted had been removed and he now asked those who had reached the top of the tree in assistantship to remember the time when they would have appreciated the formation of an Association for Chemists' Assistants. He begged to propose, "That this meeting feels the desirability of an organization for the purpose of social intercourse and promotion of good feeling among chemists' assistants, and the discussion of all matters affecting their welfare."

Mr. Stephenson, in seconding the motion, thought that had present employers had social meetings, such as this Association was intended to produce, there would be much less jealousy now, and less difficulty about the early closing matter.

Mr. Princep proposed the second resolution—"That this want will be best supplied by the establishment of an association to be designated 'The Chemists' Assistants' Association,' which shall provide rooms for the occasional discussion of scientific subjects, and at other times to be used as reading and smoking rooms by the members." He said associations of this kind existed in many country towns and were productive of much good, promoting good feeling not only among assistants but also between employers and assistants. He accounted for the fact that no association existed in London by stating that the majority of assistants had their time so fully occupied by business that none was left to think of organization, or that they were too indifferent. He thought they required the services of Dr. Ox with his oxygen to instil a little life into them. A letter had been read from Mr. Greenish suggesting the amalgamation of the new Association with the School of Pharmacy Students' Association. He was certainly in favour of such amalgamations, if practicable. It would be to their mutual benefit, for union was strength.

Mr. Fox seconded the motion.

Mr. Hampson, in supporting it, said he was glad the Association had been started. He imagined there were rocks ahead, but was sure nothing but good could come from their meeting together, and the energy and tact required to steer their craft successfully would but strengthen them for far more serious conflicts. It was a good thing to unite—union was strength—but they must remember everything depended on themselves individually. Each must do his share, and if they had a dozen good men and true he felt sure they would carry the Association to a triumphant success.

Mr. Wallis proposed, "That having heard the intentions of the promoters of the Association explained, this meeting pledges itself to do the utmost to secure the desired objects." He said that when he came to London he felt strongly the lack of that sociality among assistants which was conspicuous in the provinces. He had seen great good come from one or two provincial associations for both employers and assistants. Some people said the proposed association would not answer, for they would never get assistants to come together. He could only say that if they would not meet for their own benefit they ought to be ashamed of themselves. He was pleased to see so many there to refute that objection by their presence. He then briefly stated the objects of the Association, and trusted those present would show their interest in the movement by aiding it as much as possible.

Mr. Stuart, in seconding the motion, said that having so unanimously passed the first and second the meeting was bound to pass the third resolution, which was the logical outcome of the two former ones. The first stated that there was a want; the second showed how that want could be supplied, and this they were bound to support. He urged his hearers to come forward and join the ranks, and to induce their friends to do so too, and unite, not against their employers, but for their own welfare and advancement; in one word, for the triumphant establishment ofthe Chemists' Assistants' Association.

The resolution was unanimously carried.

Mr. McKnight proposed "That the thanks of this meeting be accorded to those gentlemen who had so willingly subscribed towards the expenses of formation." He said several employers had subscribed, who candidly told him they did not think the Association would succeed; nevertheless they had liberally paid their subscriptions, and he would like to see many who had as yet only expressed sympathy, assist the promoters in the way Mr. Williams, the President of the Pharmaceutical Society, had done.

Mr. Moon, in seconding this resolution, said he thought a thorough canvass would greatly increase the number of members, as several of his friends, notwithstanding the number of circulars sent out, had heard nothing of the movement.

Mr. Long (Notting Hill), in supporting the motion, said that for one night he had left the public to take care of itself. He had no assistant, so if any one came to his shop he would have to go without medicine that night. He thought the movement a good one, for even when they had time to amuse themselves, assistants did not known how to set to work about it; and a bond such as this Association would form would be a very good thing. He thought masters were sometimes like the monkey in the fable, and made cat's paws of their assistants to rake a few chestnuts out of the pockets of the public. That public would never think well of them until they thought well of themselves, and he did not think that they should let the public look upon chemists as its slaves. Let them free their business from their chains, and the public would respect them for it.

Mr. Bull proposed "That the Secretary be instructed to convey the thanks of this meeting to the President and Council of the Pharmaceutical Society for the loan of the lecture theatre." He hoped they would soon have rooms they could call their own and spend many pleasant and instructive evenings.

Mr. Baker seconded the motion, and it was carried unanimously.

Mr. Hetherington then proposed and Mr. Bath seconded a vote of thanks to the Chairman, which was carried unanimously.

After a suitable reply from the Chairman the meeting broke up.

Many assistants were enrolled as members at the close of the proceedings.

The Secretary stated that a meeting would be held on July 10th, if possible, to consider the rules, and that the preliminary committee would then resign, and a President and Council be elected.

The Pharmaceutical Journal.

SATURDAY, JULY 7, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W.* *Envelopes indorsed "Pharm. Journ."*

THE COUNCIL PRIZES.

COMPLAINTS against existing regulations not unfrequently arise from some misunderstanding, or from careless observation, and unpleasant as they are to hear they have the advantage of affording an opportunity to the complainant of increasing his information and modifying his too often distorted views by the correspondence evoked.

It is now little more than a year ago that the rules for the competition for the Council prizes were definitely settled, and it is therefore a matter of regret that already distant mutterings of dissatisfaction should have made themselves heard. The letter of "AULD REEKIE," which appeared in our last issue, commenting upon the character of the questions given at the last competition, has naturally enough elicited a strong protest from "ARATOR," who evidently looks at the subject from another point of view.

Since the time of ADAM it has always been a feature in human nature that he who deserves blame should try to cast it upon another, and we must confess that "AULD REEKIE" is no exception to this peculiarity. His criticisms betray that the writer of them is not in the habit of perusing the scientific portion this Journal, and imply that many others on the opposite side of the Tweed are guilty of the like abstention, an implication which we should be sorry to regard as correct.

The statement made by "ARATOR" that an admirable research upon some of the alkaloids of Melanthaceæ has already appeared in this Journal, is, unfortunately for "AULD REEKIE," quite correct. Not only so, but the classical paper on Pareira Brava, of which only a *résumé* is given in 'Pharmacographia,' appeared first in former numbers of the Journal.

If students belonging to the Society in Scotland prefer to use such a work as SCORESBY-JACKSON'S 'Note Book' (the deficiencies of which as regards Pareira Brava, etc., were pointed out in our review of the last edition), and if they do not supplement the knowledge so acquired by reference to more recent information in the Society's Journal and in works which are acknowledged by all authorities to be the best of their kind, among which 'Pharmacographia' deservedly ranks, they must not expect to be able to compete with those who take the trouble to do so. Fault-finding is very easy work, but it is particularly ungracious when the fault is found with those who work gratuitously and who are authorities on the subjects in which they examine.

The two last questions to which "AULD REEKIE" objects are such as any student would be able to answer who has read ATTFIELD'S 'Chemistry,' a work which is well known in England and America and surely cannot be unknown in Scotland. The fact that SCORESBY-JACKSON classes oil of bitter almonds under materia medica must have been overlooked, or our correspondent could not with any degree of fairness have expected it to be excluded from questions on that subject.

We feel convinced that those who carefully examine the questions proposed last year must come to the conclusion that they are carefully framed so as to give sufficient scope to various classes of students to exhibit the character of their knowledge. It is only by questions of this kind that the difference between information carefully digested and that which has been lazily and superficially accumulated can be ascertained. A little consideration must bring with it the reflection that the Council Medals, which are the highest rewards the Society offers, should rightly be bestowed upon those who have taken pains to gain information and who have made the most of their opportunities.

We regret to find upon examination that "ARATOR'S" statement as regards the success of Major candidates at Edinburgh is correct, and a reference to the Registrar's Report for 1876 shows that even during that year only one candidate succeeded in passing the Major examination, and he might not have been eligible to compete. We should gladly welcome a better report from Scotland; but until the Major candidates in Scotland can satisfy their own examiners as to their claims to compete for the Council Medals, complaint seems both premature and uncalled for.

SCIENCE v. SUPERSTITION IN JAMAICA.

WE have been favoured by Mr. CLAYTON of Birmingham with a perusal of a communication from Mr. J. STURGE of Montserrat, in which it is stated that in consequence of the impression that acts of poisoning are associated with the increasing belief in witchcraft in Jamaica, the government has appointed a chemist, Mr. BOWREY, to investigate the vegetable poisons of the Island. One of the plants examined by Mr. BOWREY has been the *Echites suberecta,* from which he has obtained an alkaloidal salt, one thousandth part of a grain of which is capable of poisoning a cat. The operation was a very unpleasant one in consequence of the pain caused when small particles of this substance came into contact with the skin.

ORANGES AND LEMONS.

GREECE and the Levant are countries in which lemons and oranges grow in abundance, and Dr. LANDERER of Athens, in a communication received from him on the subject, estimates that more than 100,000,000 of lemons, oranges, and citrons are consumed or exported by the inhabitants of various parts of Asia Minor. There are also met with all the other sorts of fruits of the family Hesperidæ, such as *Citrus Indica*, commonly known as mandarins.

The fruits of *Citrus Cedro* and *Citrus Decumana* are collected for the preparation of the confection Citrinate. The fruit known under the name of Adam's apples and Paradise apples, called in the Levant *Trappes*, are there employed by the Jews for ornamenting their synagogues on festival days. At certain times these fruits are exported in little barrels preserved in brine.

The parings of these millions of fruits have hitherto been thrown away as useless. But recently some Sicilians have introduced into the island of Poros the art of preparing the essential oil. Steps are also being taken to condense the juice and send it to Europe under the name of *Agro Condensato*.

CULTIVATION OF JALAP IN JAMAICA.

ACCORDING to the last report on the Jamaica Botanic Gardens it seems that nearly two acres of land attached to the cinchona plantation is now systematically cropped with jalap, the crops during the past year amounting to 1700 lbs., and it was estimated at the time the report was written, about the middle of February last, that at least 3000 lbs. additional would be obtained in the course of a few months, which produce would be sent to England.

ITALIAN CASTOR OIL.

THE following appears in a recent report from Italy relative to the manufacture of castor oil in the neighbourhood of Forli. The oil, it is said, is obtained by an improved method. Besides the common oil, a double quality is produced of which the average consumption is 14,000 bottles, each containing 54 grams; the residuum after the extraction of the oil forms a very useful manure, well suited for the cultivation of hemp, and it is also used in the composition of almond paste for the hands, which is sold in packets of 160 grams. The annual consumption amounts to about 5000 packets, of which 2000 are sold in the city of Bologna.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A MEETING of the above Association will be held at 17, Bloomsbury Square, on Thursday evening next, July 12, at eight o'clock, when a paper on "The Theories of Darwin concerning Evolution," will be read by Mr. EDWIN RICHARDSON.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, July 4, 1877.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atherton, Atkins, Betty, Bottle, Brown, Churchill, Cracknell, Gostling, Greenish, Hampson, Hanbury, Hills, Mackay, Owen, Rimmington, Robbins, Sandford, Schacht, and Shaw.

The minutes of the preceding meeting were read and confirmed.

THE INAUGURAL SESSIONAL ADDRESS.

The SECRETARY reported that Mr. Southall had acceded to the request of the Council to deliver the Inaugural Address to the Students in October next.

THE CHEMISTS' ASSISTANTS' ASSOCIATION.

The SECRETARY read a letter of thanks from the Secretary of the Chemists' Assistants' Association, for the use of the lecture theatre for a preliminary meeting, and a further letter asking the use of the room on July 10th, for the purpose of electing a committee and officers.

The request was ordered to be complied with.

ELECTIONS.

MEMBERS.

Pharmaceutical Chemists.

The following Pharmaceutical Chemists were elected Members of the Society:—

Brayshay, Thomas ....Stockton on Tees.
Bullen, George William ....London.
Glover, William Kensit ....London.
Greenish, Henry George.........London.
Gutheridge, George Frederick..Falmouth.
Harrison, William Hopper ......Newton Abbot.
Parker, Robert Henry............Barnstaple.

Chemists and Druggists.

The following registered chemists and druggists were elected Members of the Society:—

Garrow, William ....Keith.
Smith, John ....Charlestown of Aberlour.
Walker, John Henry ....Hull.

ASSOCIATES IN BUSINESS.

The following having passed their respective examinations and being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Edwards, James ....Chelsea.
Moore, John Ernest ....Loughborough Junction.
Tweedie, Alexander ....Innellan.

Modified.

Alexander, William...............Banff.

ASSOCIATES.

The following having passed their respective examinations and having tendered their subscriptions for the current year, or having paid the subscriptions of Apprentices or Students, were elected "Associates" of the Society:—

Alcock, Joseph Pitman ....Worcester.
Bell, Henry ....Newcastle-on-Tyne.
Brearey, Arthur William ......Douglas.
Hill, Arthur ....Cheltenham.
Hinks, John ....London.
Lunn, Alfred.........................Spalding.

Marshall, George Thomas ......Newcastle-on-Tyne.
Nicholson, Richard ....Darlington.
Savory, Arthur Ledsam ....London.
Stubbs, Edwin ....Hull.
Troughton, Henry ....Lancaster.
Wright, George.....................Park, Sheffield.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary examination, and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Alldridge, Charles Harry ......Bath.
Blades, William Wrench.........Northwich.
Bunting, Frank Alexander......Witney.
Caton, Edwin Charles............Shepherd's Bush.
Hughes, Evan ....Chelmsford.
Laughlin, Edwin Drewery ......Ramsey.
Perkins, Thomas Frampton......Clifton.

The names of the following persons were restored to the Register of Chemists and Druggists:—

William Witchellow, 35, East Street, Walworth, Surrey.
James Lyon, 102, Kingsland High Street, Middlesex.
George Bassett Hutchinson, 8, Station Road, Westgate-on-Sea, Kent.

One individual was restored to his former status in the Society upon payment of the current year's subscription and a fine.

Reports of Committees.

FINANCE.

The report of this Committee was read and various accounts ordered to be paid.

Mr. Sandford asked what further liabilities were due in respect of the Conversazione, because the amount already charged was very small compared to that in previous years.

The Secretary said the accounts were not completed, but there would be, he thought, a saving of more than £100, compared with the amount expended last year.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£15 to the widow of a registered chemist and druggist, who has had a previous grant of £10.

£10 to the widow of a former member, aged fifty-four.

£10 to a registered chemist and druggist, suffering from incurable disease.

£10 to a registered chemist and druggist who has been in business about twenty-seven years.

Another application was referred for further inquiries.

The report and recommendations were received and adopted.

Benevolent Fund Dinner.

The Secretary read the report of this Committee, from which it appeared that the number of persons attending the dinner was 245, and the principal figures in the accounts were as follows:—Donations, £1579 14*s.* 10*d.* New Annual Subscriptions, £92 7*s.* Dinner Tickets, £306 12*s.* The total expenses were £382 18*s.* 8*d.*, leaving a balance of £1595 15*s.* 2*d.* Further payments, amounting to £10 10*s.* had been since received, raising the total proceeds to £1606 5*s.* 2*d.*

The report was received and adopted and the sum of £1606 5*s.* 2*d.* ordered to be invested immediately.

The President, in putting the resolution, said there was one omission he had made in his remarks at the dinner, for he certainly ought to have said something in the way of thanks to the officers of the Society, especially the Secretary and the Assistant-Secretary, for the very efficient manner in which they had carried out the work in connection with the dinner. He thought it would not be too late even now to pass a resolution to this effect.

A resolution was afterwards passed on the motion of Mr. Brown, seconded by Mr. Greenish—

"That the best thanks of the Council be tendered to the Secretary and Assistant-Secretary for their services in carrying out the arrangements which so largely conduced to the success of the Benevolent Fund Dinner."

The Secretary, in thanking the Council, said the Benevolent Fund had always been a hobby of his, and it was very satisfactory to him to find its sphere of usefulness being enlarged.

Provision for an Orphan.

Mr. Owen, referring to the case mentioned last month of an orphan whom he had endeavoured to get elected into an asylum by the aid of twenty guineas voted by the Benevolent Fund Committee, now asked for an additional thirty guineas, to ensure the child's success at the ensuing election. According to the rules, the Council might, if it thought fit, provide for an orphan by purchasing an entry into an asylum; but he did not ask for so much as that, because the mother and friends had done a great deal; but he believed that if thirty guineas were now voted, in addition to the twenty already granted, he could make sure of the child's election. He would therefore move that this be done.

Mr. Hills seconded the motion.

Mr. Betty objected, as a matter of form, that this was a grant of money of which no notice had been given, and also that the application came before the Benevolent Fund Committee on the previous day, when it was fully considered.

Mr. Owen: No.

Mr. Betty said the matter was gone into certainly.

Mr. Brown was very loth to say anything against the exercise of benevolence, but he must agree with Mr. Betty that the method of bringing this forward was totally out of order; it was clearly committee work, and the grant ought to be recommended by the Benevolent Fund Committee before it was brought before the Council. Besides, it ought to have been brought forward before the report of the Benevolent Fund Committee was adopted.

The President said Mr. Owen did mention the matter to the Benevolent Fund Committee on the previous evening, but he was then told that he was out of order, and that the matter should be brought before the Council. If the money were not granted now it would be of no use, because the election would take place on Tuesday next.

Mr. Atherton suggested that Mr. Owen should withdraw his motion, until after Mr. Robbins' motion had been discussed.

Mr. Owen said this was not necessary. The purchase contemplated by Mr. Robbins would require £120 to £150 in each case, according to the age of the child, while he simply wanted thirty guineas to help.

Mr. Shaw said the matter had been discussed on the previous evening. He understood that at the former election the lowest successful candidate obtained 650 votes, whilst theirs had only 134, leaving a deficiency of 525 which would cost £130 to obtain.

Mr. Owen said a large additional number of votes had been already obtained.

Mr. Shaw said he was quite willing that this sum should be placed in Mr. Owen's hands, provided it were not expended unless success could be guaranteed. But he must say he did not like the principle on which these elections were conducted, for they partook so much of the nature of gambling as to be in his view very detrimental to the morals of the country.

Mr. Greenish supported the motion, which was then carried, Mr. Owen saying he should not expend the money unless he felt something like certainty that the candidate would be successful.

Mr. Betty desired that his protest should be recorded against a money vote being passed without previous notice being given.

Library, Museum and Laboratory.

Professor Redwood had reported to the Committee that the attendance in his class was about as usual.

Professor Bentley had reported that his class at the Botanical Gardens contained about the average number, and the conduct of the students that was highly satisfactory.

Professor Attfield had reported 86 entries during the session, 44 students being now at work.

The Librarian had reported the average attendance during the previous month to have been, day 21, evening 10. Circulation of books, in town 207 : country (to 21 places) 43. He had also reported donations from the British Pharmaceutical Conference; Mr. A. Rivers Willson; the School of Pharmacy Students' Association; the Surgeon General, U. S. War Department; the Philadelphia College of Pharmacy; the American Pharmaceutical Association; the Smithsonian Institution; the University of London; Mr. F. W. E. Shrivell; Monsieur A. Petit; Professor Dragendorff; Dr. Lionel Beale, and Professor Soubeiran.

It had been ordered that letters of thanks should be sent to the respective donors.

The following books were recommended to be purchased:—

General Fund.—Everett's 'Elementary Physics.'

Hanbury Fund.—Continuation of Pfeiffer's 'Nomenclator Botanicus;' Lemaout and Decaisne's 'Botany,' translated by Mrs. Hooker.

It was recommended that a subscription of 10*s.* 6*d.* be paid, and that the Librarian be requested to attend the proposed conference of librarians, to be held in October next.

The Curator had reported the average attendance in the museum to have been, morning 17; evening 6. The whole of the catalogue was now in the printer's hands; and the Curator had been instructed to prepare an estimate of the cost and labour required to prepare a catalogue of the Hanbury Collection. The Curator had also reported the receipt of another case of Indian drugs from Professor Dymock of Bombay, illustrating his papers published in the Journal.

The revised list of Local Secretaries had been presented by the Secretary, and it had been approved subject to the further supervision of the President after communication with the persons nominated.

The Committee had considered and discussed the question of arrangements for the evening meetings, but the further consideration of this matter had been deferred until the next meeting, when the Professors and Editor would be requested to attend.

The report and recommendations were received and adopted.

It was also resolved that the persons named in the following list be appointed Local Secreteries for the ensuing year.

List of Local Secretaries, 1877-8.*

Towns eligible.	Names of persons appointed.
Aberdare	Thomas, Watkin Jones.
Aberdeen	Davidson, Charles.
Abergele	Hannah, John.
Aberystwith	Wynne, Edward Price.
Abingdon	Smith, William.
Altrincham	Hughes, Edward.
Arbroath	Shield, George.
Ashbourne	Bradley, Edwin Silvester
Ashby-de-la-Zouch	Johnson, Samuel E.
Ashton-under-Lyne	Bostock, William.
Aylesbury	Turner, John.
Banbury	Ball, George Vincent.
Banff	Ellis, Bartlett.
Bangor	Roberts, Meshach.
Barnsley	Badger, Alfred.
Barnstaple	Goss, Samuel.
Barrow-in-Furness	Steel, Thomas.
Bath	Commans, Robert Dyer.
Bedford	Cuthbert, John M.
Belper	Ashton, John.
Berwick	Carr, William Graham.
Beverley	Hobson, Charles.
Birkenhead	Nicholson, Henry.
Birmingham	Southall, William.
Bishop Auckland	Leigh, John James.
Blackburn	Pickup, Thomas Hartley
Blackpool	Harrison, John.
Blandford	Bird, Matthew Mitchell.
Bodmin	Williams, Joel Drew.
Bolton	Dutton, George.
Boston	Fowler, W. R.
Bournemouth	Duncan, Alexander.
Bradford (Yorkshire)	Rimmington, Felix W. E.
Brecon	Meredith, John.
Bridgnorth	Deighton, Thomas Milner.
Bridlington	Forge, Christopher.
Bridport	Tucker, Charles.
Brighton	Gwatkin, James Thomas.
Bristol	Stoddart, William W.
Buckingham	Sirett, George.
Burnley	Thomas, Richard.
Burslem	Blackshaw, Thomas.
Bury St. Edmunds	Youngman, Edward.
Buxton	Barnett, Alexander.
Cambridge	Deck, Arthur.
Canterbury	Bing, Edwin.
Cardiff	Proctor, S. J.
Cardigan	Jones, John Edward.
Carlisle	Thompson, Andrew.
Carmarthen	Davies, Richard M.
Carnarvon	Lloyd, W.
Chelmsford	Baker, Charles Patrick.
Cheltenham	Smith, Nathaniel.
Chester	Grindley, William.
Chesterfield	Greaves, Abraham.
Chichester	Long, William Elliott.
Chippenham	Coles, John Coles.
Christchurch	Green, John.
Cirencester	Mason, Joseph W.
Clevedon	Martin, J.
Cockermouth	Bowerbank, Joseph.
Colchester	Shenstone, James B. B.
Congleton	Goode, Charles.
Coventry	Wyley, John.
Crewe	McNeil, James Norton.
Croydon	Barritt, G.
Darlington	Robinson, Alfred Francis.
Deal	Green, John.
Denbigh	Edwards, William.
Derby	Frost, George.
Devizes	Evans, John.
Devonport	Codd, Francis.
Dewsbury	Gloyne, C. G.
Diss	Gostling, Thomas Preston.
Doncaster	Dunhill, William W.
Dorchester	Evans, Alfred John.
Dorking	Clift, Joseph.
Dover	Bottle, Alexander.
Droitwich	Taylor, Edmund.
Dudley	Hollier, Elliot.
Dumfries	Allan, William.
Dundee	Hardie, James.
Dunfermline	Seath, Alexander.
Durham	Sarsfield, William.
Eastbourne	Provost, James A.

* Local Secretaries are appointed in all towns in Great Britain which return a Member or Members to Parliament, and in such other Towns as contain not less than Three Members of the Society or Associates in Business.

Towns eligible.	Names of persons appointed.
Edinburgh	Mackay, John.
Elgin	Robertson, William.
Ely	Pate, Henry Thomas.
Evesham	Dingley, Richard Loxley.
Exeter	Delves, George.
Eye	Bishop, Robert.
Falkirk	Murdoch, David.
Falmouth	Newman, W. F.
Fareham	Batchelor, Charles.
Faversham	Underdown, F. W.
Flint	Jones, Michael.
Folkestone	Goodliffe, George.
Gateshead	Elliott, Robert.
Glasgow	Kinninmont, Alexander.
Gloucester	Meadows, Henry.
Gosport	Hunter, John.
Grantham	Whysall, W.
Gravesend	Bulgin, William.
Greenock	Fraser, Charles.
Grimsby, Great	Palmer, Enoch.
Guildford	Martin, Edward W.
Haddington	Watt, James.
Halifax	Dyer, William.
Harrogate	Davis, R. Hayton.
Hartlepool	Jackson, William G.
Harwich	Bevan, Charles F.
Hastings and St. Leonards	Jameson, William E.
Haverfordwest	Williams, William.
Helston	Troake, Marler H.
Hereford	Jennings, Reginald.
Hertford	Lines, George.
Heywood	Beckett, William.
Hitchin	Ransom, William.
Horncastle	Kemp, William.
Horsham	Williams, Philip.
Huddersfield	King, William.
Hull	Bell, Charles Bains.
Huntingdon	Provost, John Pullen.
Huntly	Prott, William.
Hyde	Wild, Joseph.
Hythe	Lemmon, Robert Alce.
Inverness	Galloway, George Ross.
Ipswich	Anness, Samuel Richard.
Jersey	Ereaut, John, jun.
Kendal	Severs, Joseph.
Kidderminster	Hewitt, George.
Kilmarnock	Borland, John.
King's Lynn	Atmore, George.
Kingston-on-Thames	Walmsley, Samuel.
Kirkcaldy	Storrar, D.
Knaresborough	Sindall, John William.
Knutsford	Silvester, Henry Thomas.
Lancaster	Bagnall, Wm. Henry.
Launceston	Eyre, Jonathan Symes.
Leamington	Jones, Samuel Urwick.
Leeds	Reynolds, Richard.
Leek	Johnson, William.
Leicester	Cooper, Thomas.
Leighton Buzzard	Readman, William.
Leith	Finlayson, Thomas.
Leominster	Davis, David Frederick.
Lewes	Martin, Thomas.
Lichfield	Perkins, John Jaquest.
Lincoln	Maltby, Joseph.
Liskeard	Young, Richard.
Liverpool	Abraham, John.
Llandudno	Williams, Thomas.
Longton	Prince, Arthur G.
Loughborough	Paget, John.
Louth	Hurst, John B.
Lowestoft	Sale, Thomas J.
Ludlow	Cocking, George.
Lyme Regis	Thornton, Edward.
Lymington	Allen, Adam U.
Macclesfield	Bates, William Isaac.

Towns eligible.	Names of persons appointed.
Macduff	Henry, James Hay.
Maidenhead	Walker, Robert.
Maidstone	Rowcroft, Albert Edward.
Maldon	Wallworth, David.
Malmesbury	Brown, Francis James.
Malton	Hardy, George.
Malvern	Metcalfe, Edmund Henry
Manchester, etc.	Wilkinson, William.
March	Davies, Peter Hughes.
Margate	Knight, Alfred.
Merthyr Tydvil	Smyth, Walter.
Middlesborough	Robson, James Crosby.
Montrose	Burrell, George.
Neath	Hibbert, Walter.
Newark	March, William.
Newbury	Davis, Frank Pratt.
Newcastle-under-Lyne	Cartwright, William.
Newcastle-on-Tyne	Proctor, Barnard S.
Newport (I. of Wight)	Orchard, Herbert Joseph.
Newport (Mon.)	Pearman, Henry.
Newtown	Owen, Edward.
Northallerton	Warrior, William.
Northampton	Bingley, John.
Norwich	Sutton, Francis.
Nottingham	Atherton, John Henry.
Nuneaton	Iliffe, George.
Oldham	Hargraves, H. Lister.
Oswestry	Saunders, George James.
Over Darwen	Hargreaves, Wm. Henry.
Oxford	Prior, George T.
Paisley	Hatrick, William.
Pembroke	John, David William.
Pembroke Dock	Andrews, Charles.
Penrith	Kirkbride, W.
Penzance	Cornish, Henry Robert.
Peterborough	Heanley, Marshall.
Petersfield	Edgeler, William B.
Plymouth	Balkwill, Alfred P.
Pocklington	Cundall, Robert.
Pontefract	Bratley, William.
Poole	Penney, William.
Portsmouth, etc.	Rastrick, J. L.
Preston	Barnes, James.
Ramsgate	Morton, Henry.
Reading	Hayward, William G.
Redcar	Little, Henry.
Redditch	Mousley, William.
Retford	Clater, Francis.
Richmond (Yorks)	Thompson, John Thomas.
Ripon	Judson, Thomas.
Rochdale	Taylor, Edward.
Rochester	Harris, Henry William.
Ross (Herefordshire)	Stafford, John.
Rotherham	Horsfield, John M.
Rothesay	Duncan, William.
Runcorn	Whittaker, William.
Rugby	Garratt, John C.
Ruthin	Bancroft, John James.
Ryde (Isle of Wight)	Pollard, Henry Hindes.
Rye	Waters, William Allen.
St. Albans	Martin, Henry Gilham.
St. Andrews	Govan, Alexander.
St. Austell	Hern, William Henry.
St. Ives (Cornwall)	Young, Tonkin.
Salisbury	Atkins, Samuel Ralph.
Sandwich	Baker, Frank.
Scarborough	Whitfield, John.
Seacombe	Shaw, Ralph Horwood.
Selby	Colton, Thomas.
Shaftesbury	Powell, John.
Sheerness	Bray, John.
Sheffield	Ward, William.
Shields, South	Mays, Robert, J. J.
Shipley	Dunn, Henry.
Shoreham	Barker, John.

Towns eligible.	Names of persons appointed.
Shrewsbury	Cross, William Gowen.
Slough	Griffith, Richard.
Southampton	Dawson, Oliver R.
Southport	Walker, William Henry.
Spalding	Shadford, Major.
Stafford	Averill, John.
Stalybridge	Brierley, Richard.
Stirling	Duncanson, William.
Stockton-on-Tees	Brayshay, Thomas.
Stoke-on-Trent	Adams, Jonathan Henry.
Stourbridge	Bland, T. F.
Stratford-on-Avon	Hawkes, Richard.
Stroud	Blake, William F.
Sudbury	Harding, James John.
Sunderland	Nicholson, John J.
Swansea	Brend, Thomas.
Tamworth	Allkins, Thomas Boulton.
Taunton	Prince, Henry.
Tavistock	Gill, William.
Teignmouth	Cornelius, Joseph.
Tenby	Davies, Moses Prosser.
Tewkesbury	Allis, Francis.
Thirsk	Thompson, John.
Tiverton	Havill, Paul.
Torquay	Smith, Edward.
Totnes	Keen, Benjamin.
Truro	Serpell, Samuel.
Tunbridge	Wibmer, Lewis Michael.
Tunbridge Wells	Howard, Richard.
Uttoxeter	Johnson, John Borwell.
Wakefield	Hick, Matthew Bussey.
Wallingford	Payne, Sidney.
Walsall	Highway, Henry.
Waltham Abbey	Marshall, Jas. Ainsworth.
Wareham	Randall, Thomas.
Warrington	Woods, Joseph Henry.
Warwick	Pratt, Henry.
Watford	Chater, Edward Mitchell.
Wednesbury	Gittoes, Samuel James.
Wellington	Langford, John Brown.
Westbury	Taylor, Stephen.
West Bromwich	Laugher, William.
Weston-super-Mare	Gibbons, George.
Weymouth	Groves, Thomas Bennett.
Whitby	Stevenson, John.
Whitehaven	Kitchin, Archibald.
Wick	Miller, Kenneth.
Wigan	Phillips, Jonathan.
Winchester	Hunt, Richard.
Windsor	Russell, Charles J. L.
Wolverhampton	Brevitt, William Yates.
Wokingham	Spencer, Thomas.
Woodbridge	Clarke, G. E.
Woodstock	Griffits, John Alonza.
Worcester	Virgo, Charles.
Worthing	Cortis, Charles.
Wrexham	Edisbury, James Fisher.
Wycombe	Furmston, Samuel C.
Yarmouth, Great	Poll, Wm. Sheppard.
York	Davison, Ralph.

House.

The report of this Committee was read. It recommended certain small matters to be done to the Society's premises during the recess, for which an estimate had been obtained.

The President thought the Committee had been rather too economical on the present occasion, and that some of the work proposed to be done now would have to be repeated in a very short time, when the whole outside of the house would have to be painted. He thought it would be wiser to reconsider the matter.

Mr. Greenish said it was not usual to send back a matter to the Committee after it had been fully considered, unless there was good reason for doing so.

Mr. Robbins said there had been fresh light thrown on the matter, and it might very well be reconsidered.

Mr. Betty thought it would be a slur on the Committee if their report were sent back.

The Vice-President agreed with Mr. Betty that the views of the Committee ought to be carried out.

Mr. Churchill asked if the small amount of outside work proposed to be done could not wait for another year.

Mr. Gostling thought the wood-work now proposed to be painted would be all the better for the additional coat, even if it were redone next year.

After some further conversation the report of the Committee was received and adopted.

Poison Regulations for Ceylon.

The President read some correspondence which had passed between the Home Office and himself relative to poison regulations which the Colonial Office proposed to introduce into Ceylon, he having been compelled, by considerations of time, to act with the assistance of some of the London members of the Council without waiting for the present meeting. The proposed ordinance had been based upon the Pharmacy Act of 1868, and he had pointed out the additions which had since been made to the schedule of poisons, and enclosed a copy of the printed paper on the subject issued by the Council. He had also informed the authorities at the Home Office that the question of adding chloral hydrate to the schedule of poisons was at present under the consideration of the Council.

Mr. Shaw said he had some time ago suggested that a reference to the additional schedule of poisons should be added to the Pharmacy Act.

The President said such a reference had been inserted in the Calendar, at Mr. Shaw's suggestion, but they had no power to make any additions to the Register, which was an official document.

Mr. Schacht remarked on the fact that the poisons proposed to be inserted in the schedule to the ordinance were only those the sale of which was prohibited in England. He should have thought that some other poisons would have been locally used in Ceylon.

The President added that according to the proposed ordinance, there would be no examinations, but respectable persons would be licensed for one year to sell poisons at the discretion of the magistrates, penalties and even imprisonment being imposed on any unlicensed person who sold poison.

Personation at the Preliminary Examination.

The Secretary drew attention to the proceedings at the Police Court in regard to personation at the Preliminary examination, as reported at page 18, and a conversation upon the subject ensued.

The Preliminary Examination.

The Secretary presented a list of centres and table of attendances of candidates at each centre, since July, 1874, which is printed on the opposite page.

Superintendents of Written Examinations.

It was resolved that the appointment of Superintendent of the Written Examinations at the various local centres during the ensuing year should be offered to the Local Secretaries at those centres.

Mr. Schacht remarked on the very satisfactory average of candidates at nearly all the local centres, which he viewed with considerable pleasure, having proposed the introduction of the present system. There was only one centre which he should like to omit from the list, viz., Dorchester.

Some conversation followed as to the desirability of erasing Dorchester from the list, or substituting another town for it, but it was ultimately resolved to leave the list as it was at present.

PRELIMINARY EXAMINATION.

List of Centres and Table of Attendances of Candidates at each Centre.

	1874. July Oct.	1875. Jan. April. July. Oct.	1876. Jan.	1876. April.	1876. July.	1876. Oct.	1877. Jan.	1877. April.	1877. July.	Total number of attendances at each Centre.
ENGLAND AND WALES.										
Aberystwith	3	9	2	2	2	1	1	4	4	28
Barnstaple	1	1	...	1	3	1	1	...	1	9
Berwick-on-Tweed	3	1	...	1	...	...	...	2	1	8
Birmingham	31	39	13	12	15	28	12	22	11	183
Boston	6	18	5	5	2	2	1	3	7	50
Brighton	5	8	2	6	3	4	3	1	1	33
Bristol	11	29	2	9	7	6	7	4	5	80
Cambridge	12	15	2	8	6	4	4	5	3	59
Canterbury	5	11	7	5	2	1	3	2	4	40
Cardiff	8	10	4	4	8	3	4	6	6	53
Cardigan	5	4	1	4	4	2	2	4	2	28
Carlisle	3	9	4	2	3	4	5	6	7	43
Carmarthen	13	17	1	4	3	4	2	3	5	52
Carnarvon	5	8	2	...	1	1	4	...	4	25
Cheltenham	5	10	1	2	2	2	1	2	1	26
Chester	9	11	3	5	1	3	3	3	6	44
Colchester	2	3	4	3	3	3	1	1	2	22
Darlington	14	9	2	3	6	3	8	11	3	59
Doncaster	3	4	6	1	3	...	2	2	3	24
Dorchester	...	1	...	...	...	...	...	...	1	2
Douglas, I. of Man	*	*	*	*	*	*	*	*	1	1
Exeter	5	3	1	5	...	2	3	4	1	24
Guernsey	1	1	...	...	1	...	...	1	...	4
Hereford	...	1	3	...	2	1	2	2	2	13
Hull	20	22	9	4	9	3	5	4	4	80
Jersey	...	...	1	...	...	...	...	1	...	2
Leamington	6	8	1	2	1	1	1	...	1	21
Leeds	22	29	15	12	14	11	10	14	16	143
Leicester	10	12	2	3	4	3	3	7	3	47
Lincoln	8	5	6	2	3	3	8	5	3	43
Liverpool	26	32	8	11	9	6	10	13	6	121
London	107	118	28	50	40	45	39	45	34	506
Lynn	2	9	...	4	3	...	2	7	1	28
Macclesfield	4	...	...	1	2	1	2	1	...	11
Manchester	43	36	13	11	18	13	14	21	15	184
Newcastle-on-Tyne	10	18	10	10	8	4	9	6	4	79
Northampton	6	14	1	2	2	1	3	6	...	35
Norwich	8	21	3	3	4	2	10	4	6	61
Nottingham	17	22	4	9	8	3	6	8	6	83
Oxford	2	8	3	5	2	2	2	4	3	31
Peterborough	5	9	...	1	4	1	3	2	3	28
Plymouth	10	11	...	2	10	3	5	1	4	46
Portsmouth	7	8	1	5	4	...	2	4	3	34
Preston	11	11	4	7	3	7	9	4	9	65
Reading	2	8	1	1	5	1	2	4	1	25
Salisbury	2	8	2	3	...	...	...	3	2	20
Scarborough	3	7	...	3	3	3	1	...	...	20
Sheffield	8	14	5	4	6	5	3	6	2	53
Shrewsbury	6	6	4	5	2	5	3	7	1	39
Southampton	1	8	1	1	4	3	...	1	3	22
Stafford	9	4	1	2	3	3	2	3	...	27
Swansea	10	6	7	4	5	1	6	5	3	47
Taunton	2	5	2	1	2	2	1	1	1	17
Truro	2	10	2	3	2	1	3	3	1	27
Worcester	9	12	2	...	3	3	1	1	1	32
York	6	14	4	2	6	4	6	6	1	49
SCOTLAND.										
Aberdeen	15	40	5	4	5	3	6	7	5	90
Dumfries	5	5	1	3	7	1	...	3	3	28
Dundee	10	5	1	2	5	...	6	3	2	34
Edinburgh	18	37	13	9	8	10	13	14	12	134
Glasgow	13	16	4	12	6	5	11	10	7	84
Inverness	2	2	1	2	4	1	...	...	...	12
Perth	1	2	...	...	1	...	1	1	3	9

Mr. CHURCHILL thought it would be desirable in a few places to engage two superintendents, because it sometimes happened that more candidates were present than could be efficiently superintended by one person. He also wished to know if any means had been considered to prevent cases of personation occurring in future. It occurred to him that by communicating with the employers of the candidates, the handwriting might be identified.

Mr. MACKAY, with all deference, could not agree with Mr. Churchill in either point. A superintendent could ask for additional assistance if he wanted it, but this would very seldom be necessary, and so far as personation was concerned he thought by the time Mr. Hunter received his sentence it would so deter others that the Council might feel perfectly safe.

APPOINTMENT OF PROFESSORS AND CURATOR FOR THE ENSUING YEAR.

Professor Redwood was reappointed Professor of Chemistry and Pharmacy for the ensuing year.

Professor Bentley was reappointed Professor of Botany and Materia Medica for the ensuing year.

Professor Attfield was reappointed Professor of Practical Chemistry for the ensuing year.

Mr. Holmes was reappointed Curator of the Society's Museum for the ensuing year.

EXAMINERS FOR THE COUNCIL PRIZES.

Mr. MACKAY having referred to the regulations for the Council prizes as given in the Calendar, said these regulations were very freely discussed at the time, and it was then supposed that the result would be that either two gentlemen belonging to the London Board of Examiners would be appointed, or one from that board and one from the board in Scotland. It was evident, however, that there would be some difficulty in this, inasmuch as those two gentlemen would have to act together. Still he did not suppose the members of the Scotch board would care to be entirely ignored in the matter, and he would suggest that if two members of the English board were appointed this year to examine the answers, another year two gentlemen in Scotland might be nominated to the same office.

The PRESIDENT said he thought it was understood that the Council would occasionally appoint two members of the North British Board, but inasmuch as the Council knew more of the London Board than of their colleagues in Scotland, they would have to rely on Mr. Mackay to suggest the most eligible names.

Mr. BOTTLE then moved and the VICE-PRESIDENT seconded,

> "That Messrs. Carteighe and Linford be requested to conduct the examinations for the Council prizes in the present month."

The PRESIDENT remarked that there was no fee attaching to this duty—it was purely honorary.

Mr. SCHACHT expressed his concurrence in the suggestion of Mr. Mackay, that once in three years, or even every alternate year, this duty should be delegated to two members of the Scotch board. There was no occasion for a personal interview. When this matter was discussed before he was very anxious that the places of examination should not be limited to London and Edinburgh, but that an opportunity should be given to all eligible candidates to compete without the expense of a long journey. He now ventured to raise the question again, and wished to know what proportion of those eligible were likely to come up.

The PRESIDENT said the question was a much wider one than that of mere expense. These prizes were the most important given by the Society, and it was considered that candidates ought to be ready to undergo some inconvenience in competing for them.

Mr. SCHACHT asked how many competed last year.

The SECRETARY replied, eight in London, and one in Edinburgh.

Mr. SCHACHT said this was a serious matter. The prizes cost a good deal of money and nothing ought to be done which tended to limit the number of competitors.

The resolution was then put and carried.

REPORT OF EXAMINATIONS.

June, 1877.

ENGLAND AND WALES.

	Candidates. Examined.	Passed.	Failed.
Major, ...	8	6	2
Minor, 20th	15	11	4
„ 21st	20	5	15
	—35	—16	—19
Modified	3	1	2
Total .	46	23	23

Six certificates were received in lieu of the Preliminary examnation :—

1 College of Preceptors.
5 University of Cambridge.

LAW AND PARLIAMENTARY.

The report of this Committee was read. It included letters from the Solicitor stating the progress made in various cases which had been placed in his hands, in some of which a penalty had been paid. It also included a communication from the Chemists and Druggists' Trade Association giving particulars of alleged infringements of the Pharmacy Act, 1868, and a letter from Mr. Churchill expressing a hope that cautionary letters would not be sent before commencing proceedings. The question of placing chloral hydrate in the schedule of poisons had been discussed, but its further consideration had been deferred. A motion had been made in committee by Mr. Churchill that a letter should not be sent to alleged offenders before commencing proceedings, but it was lost. The remainder of the report consisted of correspondence with the Board of Trade relative to the "Institute of Chemistry."

Mr. HILLS moved that the report be received and adopted.

Mr. HAMPSON moved as an amendment—

> "That the report be received and adopted save and except the recommendation giving power to the Registrar, according to the alleged rule in existence, to write letters of caution in all cases of alleged infringement of the Pharmacy Act."

Mr. SANDFORD said there was no such recommendation in the report of the Committee.

The PRESIDENT said it had been rather by custom than by any law, that such letters had been sent, but it had been acted on by the authority of the Council and the Committee, on all occasions for some considerable period.

Mr. HAMPSON withdrew his amendment and—

Mr. BROWN moved in lieu thereof,

> "That the proceedings of the Committee be adopted save and except the portion referring to alleged infringement of the Pharmacy Act, and that this be referred back for further consideration."

He did not think it desirable in every case that a preliminary letter should be sent, and it was the first time he had heard of a rule being in existence that such a course should be followed. Had there ever been a resolution to the effect that this should always be done?

The PRESIDENT said it was the custom, but he did not know of any rule being on record. There ought to be one, however, for he remembered the Secretary being so instructed.

Mr. BROWN thought it was quite a throwing away of courtesy to send a cautionary letter in some of these cases. Some parties, calling themselves general dealers, were selling laudanum without a label, or any of the precautions prescribed by the Pharmacy Act, and it was a perfect farce to write to them; they would probably express their sorrow and promise not to offend again, which promise would probably be worth very little. Again in the case of unregistered chemists and druggists, he would at once commence proceedings, because they must be aware they were breaking the law. The case of widows carrying on business was a different thing altogether.

Mr. HAMPSON seconded the amendment. His only desire was that each case should be considered on its own merits. All information submitted should be treated on an equal footing. Local Secretaries found it very difficult in many cases to obtain information, and when information was brought to them ready cut and dried it saved an immense deal of trouble, and ought to be impartially considered and acted upon if necessary. In the meantime the cases ought to stand over for inquiry without a letter of caution being sent.

The VICE-PRESIDENT said the custom of sending these letters arose in great measure from an expensive bill sent in by the Solicitor, as it was felt that every preliminary object could be accomplished by a letter from the Secretary. He quite agreed that it was very important for the Council to avail itself as far as possible of the information furnished, and there were some cases which ought to be proceeded against, while there where others where some judgment ought to be exercised. Some cases had been before the Council previously, and the offenders ought to be proceeded against immediately on the information now furnished.

Mr. CHURCHILL said he was much surprised in Committee to find the way in which information, which had been obtained at some trouble and cost, had been treated, for the matter seemed practically shelved. He did not think it wise to persist in sending cautionary letters in all these cases, but each one should be considered on its merits. He was far from saying that every case should be prosecuted, but some ought to be, and the effect of sending a letter was to prevent the Council afterwards prosecuting for the offence. He mentioned several cases in which from his knowledge of the circumstances he was satisfied that no preliminary letter ought to be sent, but proceedings at once commenced.

The PRESIDENT having read the form of letter which was sent, said it might be deemed desirable to modify its terms, but he certainly thought a letter of some kind ought to be sent in each case.

Mr. SANDFORD thought it unfortunate that Mr. Hampson's original amendment had been altered by Mr. Brown, because it put two questions before the Council for consideration; in the natural course of things these cases would go back to the Committee. The present practice arose in this way: At a meeting of the Law and Parliamentary Committee there had been a report on a a long string of cases sent in by the Solicitor to all of which he had sent letters, and in some cases the parties had consequently desisted from infringing the Act. On inquiry it appeared that in some cases the Committee had not authorized the reference to the Solicitor, and it was then determined that in future the Secretary should in all cases write a premonitory letter, which might abate the offence without expense. The Council did not want to punish people by imposing penalties, but to prevent illegal trading. It was then a question whether the Secretary should write these letters without the authority of the Committee, but it was decided that to wait three weeks or a month was undesirable, and the Secretary was therefore authorized to write on his own responsibility. He thought it would be a very sensible course to propose that this should be discontinued, and that each case should come in the first instance before the Committee, who should decide what action should be taken.

Mr. HAMPSON said he had accepted Mr. Brown's amendment, because Mr. Sandford assured him there was no such rule as he had supposed.

Mr. BOTTLE said Mr. Brown objected to cautioning general dealers who sold laudanum without a label, but he thought these people were much less culpable than the wholesale traders who induced them to undertake the sale of such things. He entirely endorsed Mr. Hampson's sentiment, that every case should be treated in the same way, no matter where the information came from, but he had never known of a prosecution being undertaken on such evidence as had been furnished by the Trade Association. The Committee had not had the laudanum before it or any proof that the substance sold was really a poison at all. The objection had been raised that if the Solicitor were not instructed to take up these cases the chain of evidence would be broken, but he would rather see such a case fall through, than for the Council to undertake a prosecution for selling something which might turn out after all to be only treacle and water. If the Council treated these cases in the same way as those reported by private individuals there must be something more tangible to go upon before commencing proceedings. Mr. Churchill spoke of the matter being shelved, but he could not agree that there was any such intention.

Mr. SCHACHT said he could not allow Mr. Churchill's most unwarrantable assertion to pass, that the treatment of these cases was practically shelving the matter introduced by the Trade Association. He did not see the smallest evidence of anything which would justify such a statement. If it was the rule to send a letter in every case, the Council ought, treating all information received in the same way, as Mr. Hampson had said, to follow the same course with those presented by the Association as they would if he or any other individual had supplied the particulars.

The PRESIDENT said two propotions had been moved in Committee in reference to the action to be taken in the cases reported by the Trade Association, but both were withdrawn, and he believed it was understood that there was no disposition to shelve these cases, but that they should be treated in the ordinary way.

Mr. BROWN here said he would withdraw his amendment with his seconder's permission, understanding that Mr. Sandford would propose another.

Mr. SANDFORD then moved,

"That the report of the Law and Parliamentary Committee be received and adopted, with the exception of the negative passed on the motion proposed by Mr. Churchill; and with reference to that proposition this Council is of opinion that all reports of infringements of the Pharmacy Act should be brought first to the notice of the Law and Parliamentary Committee, and that it should rest with that Committee to send premonitory letters to the alleged offenders or not, according to its discretion."

He thought that would be a reasonable and proper course to adopt.

Mr. CHURCHILL seconded the amendment.

Mr. BROWN said he felt that the Committee had rather dealt with the cases *en bloc*, instead of considering each case on its merits. He by no means advocated the prosecution of all general dealers, but there were some cases which would justify such a course without any preliminary letter being sent.

Mr. BETTY regretted Mr. Brown's absence from the Committee meeting, which accounted for the error into which he had fallen. The Committee did not receive the report *en bloc*, but followed the usual practice which had been in operation for about two years. Some cases were recommended for prosecution at once, as they had heard in the report just read, but the Committee did not entertain first cases, of which they had no proof, until a letter had been sent. It was quite open to the Council, however, to give the Committee fresh instructions. Old offenders would be prosecuted at once if sufficient evidence were adduced.

Mr. HAMPSON said his impression of what passed did not agree with that of Mr. Betty.

Mr. ATKINS agreed that all information should be treated exactly alike, but he did not see his way at once to the conclusion that every case must come before the Committee before a letter was written, though it should do so before any legal proceedings were commenced. Several reasons might be mentioned, but the loss of time would suffice.

Mr Mackay saw no reason for altering an arrangement which had worked well during the last two years. The point had been rather overlooked that the Secretary only sent out these letters on his own responsibility in first cases, but where an offender did not desist after receiving such a letter proceedings were commenced without further notice. Even if the cases were placed in the hands of the Solicitor he would begin by sending such a letter, and it was in consequence of a long bill for similar letters that the Secretary had been requested to undertake the duty.

The Secretary said the Council had no idea of the enormous number of cases constantly reported to him. There was scarcely a day which did not bring information of some alleged infringement, and though he should be glad to be relieved of the trouble, he must say that these letters did a great deal of good. If all these cases were submitted to the Committee it would have to meet in the middle of the month and spend a whole day over them.

Mr. Schacht said that probably the Committee would order a preliminary letter to be sent in every case of a first offence, and he could quite see that these letters sent by the Secretary greatly lightened the labours of the Committee by sifting the cases. The object of the Society was to protect the public, not to inflict punishment, and he thought it a pity to disturb an arrangement which had worked well.

On the amendment being put the following voted:—

For—Messrs. Betty, Brown, Churchill, Gostling, Greenish, Hampson, Owen, Sandford, and Shaw.—9.

Against—Messrs. Atherton, Atkins, Bottle, Cracknell, Hills, Mackay, Rimmington, Robbins, Savage, Schacht, and Williams.—11.

The amendment was therefore lost, and the original motion adopting the Report was then put and carried.

Reporting the Council Meetings.

Mr. Hampson next moved the resolution of which he had given notice, as follows:—

"That it is desirable that the proceedings of the Council be reported by a reporter or reporters from the recognized journal or journals representing pharmacy and the trade, as well as by a reporter of the Journal of the Society."

He said an apology was almost due from him to Mr. Betty, who had moved so actively in this question some time ago. He felt the question would now be better in Mr. Betty's hands, but no doubt it would receive ample support from him. Five years ago Mr. Betty moved a resolution to the effect that the proceedings of the Council should be genuinely reported, in order that there should be full confidence attached to the proceedings of the Council. His action had certainly been very valuable, and the reports had very much improved in consequence. Years ago the Council met and its constituents and members of the trade knew very little of what occurred. Now they knew more, no doubt, but he was anxious that there should not be a shadow of a doubt as to the character of the proceedings, that there should not be any feeling in the body they represented that the proceedings were not properly reported. What was the character of the arrangement which now existed? It was certainly a very pleasant one, but, he did not think it was perfect or healthy. The Council had its own reporter, and he must certainly compliment him on the manner in which he carried out his duties; he had not a shadow of complaint to make against him, but it was almost impossible for him to give an absolutely genuine report. After he had written down what he considered to be important, the remarks of each speaker were sent to the Editor, and were put into type, and were then sent to the town members, and they had an opportunity—a very pleasant one he might admit—to amend, to improve, or to add to, or possibly to suppress a portion of the report. At any rate, it was an opportunity which he certainly had been tempted to take advantage of, for it was almost impossible for any person receiving such a report to altogether ignore it. But that was not such a report as he desired should be published. He believed that by having an independent reporter members of the Council would see themselves as others saw them, and that it would be very much healthier and better for them in every way, so that there could be no possibility of any one outside even whispering the suggestion that they reported themselves. It was his attachment to the Society that made him bring this matter forward. It had been said, and with truth, that the members had taken very little interest in the proceedings of the Society, and if the number of voters who exercised the privilege of voting indicated interest, it was certainly very small. He would rather increase that interest by producing perfect confidence, and that he believed would be the effect of carrying out his motion. He saw no objection to having the kind of report he alluded to. The Council had always the opportunity when anything very special was being considered of a private nature to do so in Committee, and there was also the General Purposes Committee which could discuss any important and delicate question which it was not desired to publish. He would also call attention to the fact that other bodies occupying a similar position allowed independent reports to be published. This was the case with the Medical Council, which did not report itself; and what he wished was that there should be no obstacle to the introduction of an independent reporter from any journal or journals, because there might be two or three pharmaceutical journals, and it would be very desirable that each journal should have an opportunity of reporting the proceedings. He recommended the resolution to the Council as the natural result of what had taken place in the past; and besides the advantages he had named, he thought there would be less desultory talk, and the business would be got through better and more quickly.

Mr. Churchill had much pleasure in seconding the resolution. Since he had sat at the Board he had been able to see that the debates appeared fairly reported, but there was an impression amongst the people outside that the members of the Council reported themselves, and and he thought the best way to rebut such an idea would be to admit accredited reporters from any other pharmaceutical organs who might wish to attend. The only argument he need use was to point out a little correspondence which had taken place relative to the last election, the observation having been made by several members of Council and others how small a proportion of the Society voted in these important elections.

Mr. Schacht entirely concurred with the proposition introduced by Mr. Hampson, though he should say it was not from the smallest idea of any better report being given of the proceedings which took place there. It was because of the excellence of the reports which were prepared by the reporter, that he wished all reports of their proceedings to come through the same sort of channel. Now it was a fact that there was another journal, which more or less professed to represent pharmacy, in which there were so-called reports of what took place at the Council Board. From whom the editor received the inspiration was a mystery to him, but it was an inspiration of a very curious sort indeed. He had often seen the most extraordinary exaggeration and misrepresentation of what speakers had said, which he was quite sure the editor would never have sanctioned with his eyes opened. This had always presented itself to his mind as a strong reason why he should have an opportunity of sending his accredited reporter to the meeting, and then the Council would have a right to call him to account for what he did report, and he was quite certain he would be only too glad to avail himself of the opportunity. He could not, however, allow the observation made by Mr. Hampson to pass entirely unchallenged. It appeared from what he said that individual members had an opportunity of correcting the reports of their observations before they were published. It might be that Mr. Hampson, or the members living in London, had the good fortune to be so treated, and no doubt they deserved that privilege, and he was not at all jealous of it, but he certainly never had the opportunity himself, and he rather thought that gentlemen in the country were left to the tender mercies of the reporter, of which, however, he personally had no reason whatever to complain.

Mr. SHAW supported the motion. He said he need not go over all the reasons for doing so, though he thought they might be proud of the manner in which their proceedings had been reported for the past five years, during which time the matter had been left entirely to the reporter. At the same time he thought it would be satisfactory to that gentleman if he had a colleague. There would not be more than one or two extra reporters who would make application under this resolution, so that he did not think any inconvenience would arise. He was not aware previously that London members had the privilege of revising their remarks.

Mr. GOSTLING, who said he was obliged to leave early, stated that he should have voted for the resolution if he had been able to remain.

The PRESIDENT said that Mr. Hanbury, who had been obliged to leave, had told him that he should have voted against it, so that those two gentlemen might be considered to have paired.

Mr. BROWN said he should support Mr. Hampson's motion. He need not repeat the satisfaction which had been expressed by every member who had already spoken with the character of the reports prepared for the perusal of the public, but which did not always go forth to the public. He considered the proceedings of the Council ought to be public property, and that there should be no revision of the report after it was written by the authorized reporter of any journal connected with the trade. He thought if they had reporters generally admitted, every member of the Council would speak under a sense of responsibility, and the work of the committees would be infinitely better done, and better prepared for the Council. At the present time many things were left undecided by the committees, to be afterwards discussed at length in Council, which might be avoided if the committee work were better done. He did not think the Council would lose in dignity by the course proposed, or that any improper revelations would be made.

Mr. SANDFORD said it would be a most excellent thing if they could save time, but he was not at all sure the plan now proposed would enable them to do so. He was sorry to hear Mr. Brown say that the reports of the Committees were not fully and properly drawn up, but however fully and properly that might be done in future he hoped the Council would never forego its privilege of acting on its own discretion whatever the report of the committee might be, for he should not like to see the Council bound hand and foot by the report of any Committee. It would often place the Council in a difficulty if there were reporters from other journals present, though it could not be said in any way that now the reports were cooked for publication. The reporter took notes and sent them to the Editor, who published just what he liked, and the members of Council themselves had no authority to interfere. Sometimes he thought it would be well if they had authority, because he had seen matters published which ought not to have been published. The Council was in a certain sense a private body and often had private business to discuss. If it were always known when these little private matters would come on, and the Council could resolve itself into Committee, well and good; there might then be as many reporters as they liked, but it would be necessary to ask them to leave the room on such occasions. It often happened that the Council did not feel the necessity of going into Committee until something had been said which it was felt the public ought not to read. Therefore he thought it was a matter for grave consideration whether other reporters should be admitted or not, and he was not prepared to vote for such a course.

Mr. MACKAY thought a good deal might be said on both sides of the question. It was in his recollection that some time ago it was remarked by some outsiders that the reports of the Council meeting were very short, and it was said that they were so short sometimes as not to give the members at a distance a fair idea either of the opinions or of the work done by the Council. He did not share that feeling, but still it became so clamant that a reference was made to the Editor whose reply was that he printed what he received, and that he could neither alter it, lengthen or shorten it unless he was allowed a seat in the room along with the reporter, when he might perhaps be able to give a longer report, and one which might give more satisfaction. That was, at the time, fully considered, but it was decided that the Editor should not be allowed to sit at the reporter's table. With all due deference he thought they might with some advantage follow a middle course on the present occasion, and admit the Editor, and give him and the reporter a fair chance for another twelve months and see the effect of that before throwing open the Council door to other journals.

Mr. ATKINS said he had come quite open to conviction and wished to hear all that could be said before making up his mind. It appeared to him, however, that the tendency of the age was rather towards publicity than secrecy. He thought the Council could scarcely call itself a private body; it was, in his opinion, pre-eminently a public body, and being returned by a large constituency it owed a duty to the constituents, the making its action at the Board, as far as reasonably and safely could be, known to them. If there were greater publicity some of those errors which did occur respecting the matter of the report might be avoided. He was not speaking of the report in the Journal, except this, that he was not satisfied with the length of the Journal report. He could not say he thought all that he had witnessed and heard there had been fully reported in the Journal, but he must bear testimony to the admirable way in which the *precis* or condensed report had been furnished. Still if a more full report had been given a great many of those unjust and unwise criticisms which had been made, never would have been written. Therefore he thought publicity might tend to avoid some of those mistakes. He scarcely understood the relation of their own reporter to their own members, and was going to ask whether it would not be possible that one reporter should furnish a more varied report if need be, to other journals. The answer would be probably readily forthcoming that such a thing would not be practicable. Still the Council was not a private body; it owed so far as was safe a report of what was done and said there to its constituents as was the case with other representative bodies. Mr. Brown, as a member of the Town Council of Manchester, could no doubt speak as to the publicity given to proceedings of that body; and he might say that in his own neighbourhood an effort was being made to have the local press represented at the meeting of the Board of Guardians, and he had no doubt that these efforts would before long be successful. The ratepayers said the guardians were bound to let them know the grounds on which they spent public money, erected buildings, and so on. He must say, therefore, the balance of his judgment rather went towards the admission of other reporters.

Mr. HILLS suggested that Mr. Hampson should alter the terms of his resolution to the effect that the proceedings of the Council be reported more fully, and that the reporter of the *Chemist and Druggist* be invited to attend.

Mr. Brown remarked that the motion simply enunciated the proposition that it was desirable that certain things should be done, and it would be necessary afterwards to refer it to the General Purposes Committee, or to pass a further resolution to say how it should be carried out.

The President said he had had an amendment put into his hand to be moved by Mr. Mackay, and seconded by Mr. Bottle:—

"That in the future meetings of the Council Dr. Paul be admitted to sit at the reporter's table with a view to more fully report the proceedings."

Mr. Brown questioned if this was really an amendment.

The President said it might easily be made so by adding a word or two, if necessary, saying that it was at present undesirable to admit more reporters.

Mr. Betty asked if other reporters were admitted, how the Council would proceed in case of going into Committee. Would those gentlemen be allowed to remain or would they be asked to leave the room each time the Council went into Committee?

Mr. Mackay here said he would withdraw the amendment referred to by the President.

Mr. Betty repeated the question he had put.

Mr. Bottle said he was one of those who had previously expressed a desire that the proceedings of the Council should be made public in every way, but he could not go with Mr. Hampson in the present motion. He had been under the impression for many years that their own Journal represented pharmacy and the trade; but the motion seemed to ignore that and look abroad for some other journal which did so. He should be prepared to admit the reporter of the *Chemist and Druggist*, but the Council should not go begging here and there asking people to send reporters to publish its proceedings, more especially so seeing the Society was interested in a Journal which was a valuable property and of which the proceedings at the Council formed a very attractive portion. Was the Council prepared to ignore the existence and the property it had in that Journal? He should be extremely sorry to see that advantage thrown away, especially as there had been no application from any other journal to admit a reporter. When there was, let it be dealt with upon its own merits. Every one of the gentlemen who advocated the admission of other reporters expressed his satisfaction with the way in which the report was prepared, and was it not well therefore to be satisfied? If the reporting was being done well why should there be a desire to go abroad and do something more? Another reason why he was not prepared to admit the reporters of medical journals or others, was that he did not think the proceedings had hitherto been carried on in that strictly formal way which would be creditable to the Council. Only that day he had had to call attention to the standing orders in order to obtain more regularity in the proceedings, and one gentleman had even interposed with remarks in the middle of the minutes of one of the Committees.

Mr. Betty here repeated his former question.

The President said it must be decided hereafter by the resolution of the Council or some Committee what regulations should be made if reporters were admitted.

Mr. Betty said it seemed to him a matter of public convenience to know whether the Council should have strangers in its midst when it was doing confidential work.

The President said he could give an opinion as a private individual on the question put to him.

Mr. Betty said the President could not occupy the chair as a private individual.

The President said he could not answer the question as President until the Council had decided upon it.

Mr. Betty replied that if he were in the chair, he thought he should have given a very explicit answer to such a question. He did certainly entertain some years ago the idea that the proceedings of the Council should be made as public as the proceedings in Parliament, but he must confess that at that time he did not fully appreciate the delicacy of many matters that came before the Council, and he could now acknowledge the better judgment of those older members who had in this respect modified the somewhat radical constitution of the motion originally brought forward by him, the result of which had been to put a drag on the wheel of the vehicle which perhaps otherwise he should have sent into a position he would not describe. The longer he sat on the Council the more he was convinced that it was necessary in this matter to argue as to what would practically be to their advantage as members of Council. The general opinion expressed by all who had spoken was that the proceedings were fully reported. Persons outside did not think they were; but what had the members of the Council to do with what others thought if their consciences told them they were in the right?—and no one could say they were not. Was the Council to be like a criminal at the Old Bailey, afraid of what people might say of him, and constantly on his defence. A more subservient argument to adduce for altering the mode of procedure he never heard. So long as the Council did its duty and was well represented by the Journal, why in the name of independence should it trouble itself about what other people said? He thought it would show much greater dignity if it were content to face any such position rather than to show itself subservient to every rumour it heard. Considering there was no actual necessity for a change, and no one said it was a necessity, why should not the arrangements remain as they were? One great complaint was that certain London members had an opportunity of seeing a slip of their speeches and making any corrections, but if that was the case he did not see that it was at all an argument against a system which had worked so well, No one on the Council had theoretically a greater love of fairness than Mr. Hampson, but when he wished to influence a certain number of votes he tried to show gentlemen from the country that those in London had some slight advantage over them. What did that signify? It ought not to weigh as an argument on the main point in dispute, and he thought it very unfair to introduce this question as between country and town. Rather than that should be made a bone of contention every town member of the Council would be ready to say he would stand in the same position as the country members. This statement had been repeated again and again until it would almost appear that the London members cooked their speeches, but nothing of the kind took place; a verbal alteration here and there was all that was ever done. It was proposed to give the editor and proprietor of the *Chemist and Druggist*—for no one else would want to come there—the privilege of sitting there and providing matter for that journal out of the reports of the Council meetings. He contended that their own Journal represented pharmacy and the trade, that it properly reported the proceedings of the Society, and that it in fact was the only journal which did represent pharmacy free from the commercial element. He then proceeded to make some further comments which he expressed a desire should not be reported, and concluded by saying he believed that if reporters generally were admitted members would feel such a restriction in speaking that the report would lose both in length and interest.

Mr. Greenish said he should vote against the motion. He thought at the present time the proceedings were reported sufficiently fully and quite fairly. There was a great deal more talk there than need be in proportion to the work done, and he feared that if another reporter were present there would be no end to the speeches which would be made,

Mr. Cracknell quite agreed with the general principles of publicity advocated by Mr. Atkins, but he thought his remarks hardly applied to the present case.

The Council was a public body in one sense, but in another sense it was not. It was the governing body of a trade, and trade interests would very frequently be best served by not being paraded too publicly. It was very desirable, therefore, that the Council should have an amount of control over the reports of its proceedings which it would not have if reporters were admitted indiscriminately, whilst their presence would much hamper the proceedings.

Mr. Robbins said he had come to the conclusion to vote against the motion. This matter came before the Council a short time ago, when it was said that several matters which had been reported were mischievous and were never intended to be reported. The answer to that was that the Council exercised no control over its reporter. That was quite correct, but the reporter was always anxious not to report what would be mischievous. If there were a number of other reporters there, however, what control could be exercised over them? It frequently happened that observations were made which, if reported, might lead to an action at law, or, at all events, would be highly injudicious. In debating a large number of subjects it was impossible sometimes not to mention names and other matters which it was necessary should not be reported. He could not see any advantage in having more reporters, because it appeared to him the reports of their meetings were fully given. In reading them over in the evening he could fancy he was sitting at the table and listening to his colleagues' observations. He could see a great disadvantage in having a large number of reporters present, but no advantage whatever.

Mr. Owen said he came perfectly unbiassed, determined to listen to every argument on every side, and he could only say that he was quite satisfied with things as they were.

The President said he had made up his mind to vote against the motion. He thought the time had not arrived when it would be expedient to introduce this change. He wished to see a good, full, faithful report of what occurred, and he was not prepared quite to go with all the gentlemen who were so perfectly satisfied with the reports. He thought they might be, and ought to be, fuller, with more colour in them. If their reporter could infuse a little more soul into them without giving any opening to those who were apt to cavil at them, it would often be an advantage. He could see many disadvantages that would follow the adopting of the motion. It might often happen that medical journals would wish to send their reporters, and when private matters were discussed they would have to be sent out of the room and great delay and inconvenience would arise.

Mr. Hampson, in reply, said he should have rather a long task if he took up all the arguments, and so-called arguments, both for and against him, and therefore he should not attempt to do so at length. Mr. Sandford, in the first place, distinctly said it would not save time to have an independent reporter, but it was found in all public bodies, as a rule, that business was facilitated by having an independent reporter present, because speakers then felt fully responsible for the views they enunciated. It would have this advantage, that gentlemen would come prepared to express their opinions, and they would not have so much desultory conversation. It was also said by Mr. Sandford that the Editor published just what he liked; but that was an eminently unsatisfactory condition of affairs. Mr. Mackay thought the Editor might be introduced in a sort of nondescript capacity; he would not be reporter, he would simply be an auditor. He did not think that would be an improvement. Mr. Atkins and Mr. Schacht it would appear were both ignorant of the advantages the town members possessed. He would like to particularize some of those advantages in reply to Mr. Betty who thought he had given unfair prominence to the privilege, although he utterly denied having done so. It was one he did not desire, and thought it was one which few men could use with satisfaction to themselves, because it placed a temptation in their way. They might think they could alter the turn of a sentence so as more completely to express their views, but that was not fair towards other members who had spoken, and who had not the same opportunity. Every man ought to be responsible for the views he enunciated at the time under the particular circumstances of the moment and to bear the consequences of his utterances, and he thought an arrangement so unfair with respect to country members eminently unsatisfactory. Mr. Betty illustrated the disadvantages which would accrue from carrying his resolution by stating that the proceedings of the Council were not of such a character as to bring credit to its members, and Mr. Bottle had likewise spoken in a somewhat similar strain. But he maintained that if that were so, by having an independent reporter the character of their discussions would be improved and time would be saved; so that on the whole those arguments were in his favour. Mr. Betty himself had undertaken to-day most unwarrantably to instruct the reporter as to how he should report his part of this discussion, and the President in the same spirit had also taken upon himself to give advice as to how the report should be prepared, recommending that he should "infuse a little soul into their reports." He had not the least objection to accept Mr. Bottle's amendment if he desired to press it, but he had made his resolution as comprehensive as possible, not wishing to single out any particular journal. If the principle were adopted arrangements could be made accordingly; but he was quite willing to accept the amendment.

Mr. Bottle said his amendment was that the Editor of the Society's Journal should be introduced, and that had been withdrawn.

Mr. Hampson, continuing, said he thought it undignified for any member to speak of the proceedings of the Council in a depreciatory style, and he believed that any journal which sent a representative there would in all probability act with perfect fairness and would not sow discord or introduce that state of havoc which Mr. Betty so much feared.

The motion was then put with the following result:—

For—Messrs. Atkins, Hampson, Schacht and Shaw.

Against—Messrs. Betty, Bottle, Cracknell, Greenish, Hills, Mackay, Owen, Rimmington, Robbins, Sandford and Williams.

The motion was therefore lost.

———

The Secretary presented further returns respecting the number of students attending the classes and the expenses in connection therewith, which, on the motion of the President were referred to the Library, Museum and Laboratory Committee, to put into a more convenient shape for discussion.

———

Mr. Robbins said that at that late hour he would postpone the motion of which he had given notice, with regard to making provision for orphan children, until the next meeting, and the Council then adjourned.

BENEVOLENT FUND.

List of Subscriptions Received during the Month of June, 1877.

	£	s.	d.
Baker, Alfred P., 33, Norfolk Ter. Westbourne Grove, W.	0	10	6
Beard, James, 5, Great Ancoats St., Manchester	1	1	0
Carter, Alfred, 532, George Street, Sydney, N.S.W.. .	0	7	0
Darby and Gosden, 140, Leadenhall Street, E.C.	2	2	0
Dobinson, Thomas, 125, Newgate St., Bishop Auckland..	0	5	0
Elliott, John G., Sheffield	1	0	0
Elliott, Thomas, Newbold Moor, Chesterfield	0	5	0
Fisher and Sons, Ramsgate	2	2	0
Franklin, James, 93, Southgate Street, Gloucester	0	5	0
Gillespie, James, Irvine	0	5	0
Greaves, Abraham, Chesterfield	0	5	0
Greaves, Wm. Samuel, Ironville	0	5	0
Haselden, A. F., 18, Conduit Street, W.	0	10	6
Hinds, H. D., The Mount, Pontardulais	0	5	0
Lewis, N. J., Neston, Cheshire	0	10	6

	£	s.	d.
Long, John T., 257, Hotwell Road, Bristol	0	10	6
Maggs, S. B., St Leonards-on-Sea	0	10	6
Mantell, Charles, 20, Cregoe Street, Birmingham	0	10	6
Nobbs, Wm. M., 290, Euston Road, N.W.	0	10	6
Peters, J. F., Jedburgh	0	5	0
Plant, F. G. L., Wellington Street, Gorton	0	2	6
Rickwood, H., Kingsmead Square, Bath	1	1	0
Steele, Samuel, 97, Union Street, Plymouth	0	10	6
Taylor, H., 39, Ledbury Road, Notting Hill, W.	0	5	0
Wills, G. S. V., 62, Lambeth Road, S.E.	0	10	6
Wright, W. O., 55, Great Scotland Road, Liverpool	0	5	0

DONATION.

	£	s.	d.
Harrison, S. W., Archer Street, Notting Hill, W.	0	5	0

Parliamentary and Law Proceedings.

THE RIGHT OF CHEMISTS TO PRESCRIBE.

At the Birmingham County Court, on Monday, before Mr. J. Motteram, Q.C., judge, an action was brought by the Society of Apothecaries, London, against James Harrison, chemist, of 73, Stafford Street, Birmingham, to recover the sum of £20, for that after the 1st of August, 1815, in contravention of an Act of George III. for the better regulation and practice of apothecaries, he did unlawfully practise as an apothecary without having the necessary certificate.

Mr. Nathan (instructed by Mr. Reeves) appeared for the plaintiffs, and Mr. Jesse Herbert (instructed by Mr. Glaisyer) for the defendant.

The case for the plaintiffs was that on the 27th of November, 1876, a woman named Julia Caddick went to the defendant's shop and asked him if he could make her up something for a weakness left on her since her confinement. Defendant inquired her symptoms, looked at her, felt her pulse, and gave her some medicine, which he said would do her good. She paid a shilling for the medicine and departed.

Mr. Charles Suffield, surgeon, said after hearing the evidence of the woman Caddick he was of opinion that she was suffering at the time she applied to the defendant from anæmia, which was a dangerous complaint and frequently ended in death if not properly treated.

After some discussion Mr. Herbert said it was clear that chemists and druggists might furnish and supply medicines, and as to attending and advising, there had been none in the present case, according to the evidence given. It was strange that for sixty years the Apothecaries' Company had allowed chemists and druggists all over the country to do what the present defendant had done without interfering in any way.

His Honour said, in his opinion, a man might go to a chemist and say "I have got the toothache, or I have the headache; will you give me some sal volatile for the headache or some tincture for the toothache?" That was one thing; but whether the chemist could take ordinary means of finding out the headache or the toothache, and then prescribe the medicine for the disease which he himself had found out, was quite another matter. If a person told the chemist that he was suffering from some disease or other, he knew not what, and the chemist felt his pulse and said, "I will give you something," surely that would be an infringement of the Act. If Mr. Herbert meant to contend that a chemist should prescribe, he would give him a case upon it.

Mr. Herbert said no examination was made by the defendant. He simply supplied the woman with what she required.

The defendant was then called. He stated that Julia Caddick asked for some medicine for general weakness. He did not examine her neither did he feel her pulse. The label on the bottle (produced) was one of his labels, but having tasted the contents of the bottle, he swore that no such stuff had ever been sold at his shop. It was not necessary to examine the woman. He prescribed for her by "instinct." He gave her a mixture of quinine and iron, which was a common remedy for anæmia.

Mr. Thomas Parsons said that when he was an apprentice in 1809, the practice adopted by the defendant in the present case was the general custom Later on he had prescribed and given medicines in simple cases. In more serious cases the prescribing was attended to by the principal at the shops where witness had been employed.

His Honour said it was still more dangerous for a man to practise if he took simply the word of a patient, who was admitted to be suffering from a serious disease. It was almost impossible to conceive how important it was that the Act should be carried out.

The case was then adjourned.

On Tuesday the case was again brought forward. Several witnesses were called, and formal evidence given with a view to disprove the statement made by the defendant to the effect that the medicine produced in Court was not that with which he supplied the woman Caddick at his shop, in November last.

His Honour said he should not have allowed such evidence to be given had it not been that the defendant's statement was a reflection upon the persons who got up the plaintiffs' case.

Mr. Herbert said his client had spoken in a moment of excitement, and he would not deny that the medicine produced was supplied at his establishment. Proceeding to address the Court for the defence, Mr. Herbert contended that a chemist had a right to prescribe small remedies in his own shop, and that he contravened the law only when he undertook to visit and prescribe for patients at their own homes.

His Honour pointed out that the Act of Parliament distinctly laid down that a chemist's duties were to "buy, compound, dispense, and vend," and said that when a chemist exceeded these duties he undoubtedly made himself amenable to the law. Baron Bramwell held that if a man went to a chemist's shop and asked for something for a headache and a medicine was supplied to him, the chemist technically infringed the terms of the Act. He (Mr. Motteram) did not put so strict an interpretation upon the law as that, but he held that if a person went to a chemist and explained certain symptoms of a disease with which he or she was not acquainted, and the chemist prescribed for such disease after an examination of any kind whatever, he made himself liable to an action under the Act of Parliament.

A lengthy argument followed, and Mr. Nathan having replied on behalf of the plaintiffs, his Honour said that as there was an appeal in a similar case pending in a higher court at the present time, he would defer judgment until after decision had been given on the appeal, for it would be unnecessary to put the defendant to the expense of taking a second case to be decided before a higher tribunal.

THE CHARGE OF PERSONATION AT THE PRELIMINARY EXAMINATION.

On Tuesday last, George Frederick Webb, was charged at the Bow Street Police Court, before Mr. Vaughan, on remand, with fraudulently procuring his registration under the Pharmacy Act, 1868, and Andrew Ritchie Hunter was charged with aiding and abetting him in the same. They were also jointly charged with conspiracy. Mr. Douglas Straight, instructed by Messrs. Flux and Co., appeared for the Pharmaceutical Society.

Evidence was given by a detective officer as to the arrest of Hunter at Wolverhampton, and to the effect that Hunter then acknowledged that he had passed the Preliminary examination for Webb, but asserted that at the time he was not aware that the proceeding was a criminal offence.

Mr. William G. Hayward, pharmaceutical chemist, of Reading, deposed that he was the Local Secretary of the

Pharmaceutical Society in Reading, and that in July, 1876, he superintended the local Preliminary examination held in that town. On that occasion five persons were present as candidates, of whom the defendant Hunter was one, and when the names were called over, Hunter answered to the name of George Frederick Webb.

Mr. Nockolds, chemist and druggist, said that the defendant Webb was in his employ when arrested. He knew that Webb had failed to pass the Preliminary in April, 1876. On the morning following the arrest witness had an interview with Webb at Bow Street, and pressed him to tell the truth and meet the charge properly. Webb then told him that after his failure to pass he was being "coached" by a Mr. Ramsay, living in Gower Street. On one occasion the class was taken by Hunter. After the close Hunter walked with Webb to the station. On the way Hunter proposed to Webb that he should pass the examination for him. Hunter said that it could be done for he had done it before. Hunter said he should require three guineas for his trouble.

The defendants being told that they were at liberty to put any questions to the witness, Hunter said that probably witness had only stated what Webb had told him, but that there were several inaccuracies in the statement. Webb made a statement in which he reiterated what he had before said to his employer.

Webb was then committed to take his trial at the Central Criminal Court, and Hunter was remanded till Friday, by which time it was expected that the prosecutors would be able to proceed against him on another charge in connection with a person for whose arrest a warrant was issued. Meanwhile Mr. Vaughan said he would admit both prisoners to bail.

On Friday, as the expected arrest had not been made, Hunter was again remanded until Monday.

We are informed that the arrest has now been made.

Poisoning by a Mercurial Powder.

Mr. Donaldson has held an inquest at the London Hospital, relative to the death of Catherine Watson, aged eight weeks. Mary Ann Watson, wife of a labourer, stated that on the previous Wednesday she took deceased to the London Hospital, as it was suffering from skin disease, and two powders and some ointment were given her. On arriving home at twelve o'clock she gave deceased one of the powders, when it became very cross and vomited. The next morning at six o'clock she took the deceased to the hospital, when it was pronounced dead. The doctor had told her to administer the powder every morning. There was something written on the paper, but she could not read. Mr. William Howes, dispenser at the London Hospital, said he gave the mother two papers of powders, there being six doses in each packet, which was marked on the outside. There was one grain in each of mercury and chalk, called grey powder. A juryman said he considered that the powders ought to be made up separately. Mr. Rees, house surgeon, said he had made a *post-mortem* examination. The quantity of mercury acting on a weak child had caused death. If the powders had been made up separately, and only one administered, it would not have caused death. The jury returned a verdict of "Accidental Death."

Poisoning by Prussic Acid.

At Kendal, Richard Braithwaite, a brazier, has committed suicide by taking prussic acid. Deceased was defendant in an action for libel which was to have been tried at the Appleby Assizes, and this appears to have weighed heavily on his mind.

Suicide of a Medical Student.

On June 26, Mr. Bedford held an inquiry at St. George's Hospital, respecting the death of Walter Hugo, a medical student, aged twenty-two. Deceased was known as a student at Charing Cross Hospital by the name of Victor Hugo. On Thursday afternoon, about four o'clock, he left Charing Cross Hospital in apparent good spirits, and at seven the same evening his dead body was found in Hyde Park, near the Reformers' Tree. The *post-mortem* examination clearly proved that death was caused by a large quantity of prussic acid.

An open verdict was returned of "Death from poison," and "that there was not sufficient evidence to show how it came into the stomach of the deceased."

Dispensing Memoranda.

[6]. Chloric Ether.—In answer to this query it is my opinion that spt. chloroformi would be the correct article to dispense when spt. æth. chlor. is ordered. When æth. chlor. is ordered I dispense a preparation mixed according to the formula given in Gray's 'Supplement," p. 633:—Chloroform 1 part, S.V.R. 8 parts.

An Assistant, *Exeter.*

[6]. Chloric Ether.—In reply to Mr. Leigh's query, I venture to say that spt. chloroformi has no more right to be substituted for æther. chlor. in a mixture than "sulph. præcip." has to be given instead of "lac sulphuris," which, in accordance with the decision in reference to the much vexed "sulphur question," are regarded as two distinct preparations. So ought the others to be looked upon; the former of B. P. strength (one in twenty), the latter with more than double the proportion of active ingredient, viz., one part of chloroform to seven of S.V.R. Unfortunately, difficulties of this nature do spring up in certain establishments—right of usage overruling the intention of the prescriber. There should be no dubiety in the matter (although considerable controversy frequently occurs upon the subject), for all young physicians are sufficiently well versed in the British Pharmacopœia nomenclature to know what "spt. chloroformi" represents, whilst the older members of the medical fraternity are not like to discard the names or despise the remedies they have, for years, been accustomed to prescribe. I suppose the best plan where disputes arise, is to go upon the principle "of two evils choose the lesser," and dispense the article insisted on by the master (if he cannot be persuaded to change his opinion), so that, in repetitions, uniformity may be adhered to, but, in all cases, the date of the formula ought to be observed, and if written prior to 1864, there is no alternative but to employ æther. chloric. (one in eight). It is a pity, however, that the younger members of our craft should be subjected to the mortification of being compelled to act in direct opposition to their conscientious and correct convictions—or otherwise lose their situations—owing to the dogmatic opinions of their employers, who have been trained in a different school.

J. B. L. Mackay.

[8]. CARBOLIC ACID MIXTURE.—Can any reader inform me how to mix the following recipe, so that the carbolic acid will not separate when more water is added?—

Ac. Carbol., Calvert's (No 5) . . . ʒj.
Hyd. Bichlor . . . . ℈ij.
Aq. ad . . . . ℥viij.

J. W. Hayton.

[9]. MISTURA FEBRIFUGA.—Would "Mistura Febrifuga," the formula for which is given in Beasley, p. 285, be the correct article to dispense in the following prescription?

℞ Liq. Morphiæ . . . . . ʒj.
Vini Ipecacuan. . . . . ʒiss.
Mist. Febr. . . . . . . ℥viij.

An eighth part every four hours. An Assistant.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Council Prizes.

Sir,—In the last issue of the *Pharmaceutical Journal*, a letter appears with the signature "*Auld Reekie*," commenting on the examination for the Council prizes offered for competition to those who have passed the Major examination during the preceding year. Some people exist who are never happy unless they have a grievance to air. "*Auld Reekie*" seems to be one of these. I consider that the very facts which he adduces as ground for complaint should really be productive of the liveliest satisfaction. He quotes some of the questions asked at the last examination, and thinks that those who studied in a London school of pharmacy would be better able to answer half of one of the questions, than others who had not done so, or even than those who had attended a course of Sir Robert Christison's lectures: that another question "smelt" strongly of the 'Pharmacographia,' and was not to be found in Scoresby-Jackson, and that "cram" is the only means of gaining the required information, and that the questions are really "catch" questions. Again that a third question under the head of materia medica really belonged more to the chemistry department, and that it is of "no consequence" to remember the proper solution of a fourth.

With regard to the first objection I venture to assert that no course of lectures alone would give the knowledge required to fully answer the half question. Within a period of eighteen months previous to the examination, an admirable research upon some of the species of the natural order Melanthaceæ had appeared in the *Pharmaceutical Journal*, and without a knowledge of which no candidate could hope to fully answer the question. I consider this highly satisfactory, as it gives direct encouragement to self-help and the acquirement of knowledge of the most valuable kind, viz., the results of modern research. The second objection is almost too trivial and absurd to require an answer. Is not the 'Pharmacographia' as easily obtainable in Scotland as in England? If a certain text-book does not contain the results of recent research, are the examiners to abstain from asking questions on that matter? Further, has not an elaborate paper on the very subject of the question appeared in the *Pharmaceutical Journal* within the last few years? Surely the *Journal* is as accessible to Scotchmen and Countrymen as to Londoners. It is intolerable to think that, because certain valuable matter does not appear in a certain text-book, and is not mentioned in a certain course of lectures, it should be gravely suggested that examiners should not select questions from that matter.

Turning to the third objection, I would simply ask "*Auld Reekie*"—How is it possible in the matter of the adulteration of drugs, to draw a line so that chemistry shall not be introduced? With regard to the question selected for criticism from the chemistry paper, I think it is of considerable "consequence" to have some knowledge of the body by the combustion of which artificial light is commonly produced. It is impossible to give its exact per centage composition, since it constantly varies from different causes, such as the amount of heat employed in its manufacture, etc. Here is a field in which a well-informed candidate might display his knowledge by stating what the chief variations and their causes are.

"*Auld Reekie*" puts forth his complaint in great measure on behalf of Scotch Students. The reality of his grievance and the quality of his championship can be judged from the fact that there has not been a single successful Major candidate at Edinburgh up to the present time during this session.

Finally, "Auld Reekie's" letter would be simply productive of amusement, did it not rouse one's indignation to the utmost by connecting the odious words "cram" and "catch questions," with the highest prize of the year. Let all intending candidates cast all thoughts of any such connection from their minds, and honestly gird up their loins for the contest. I enclose my card.

London, July 3, 1877. ARATOR.

The Testing of Tannin.

Sir,—My attention has just been directed to the correspondence in your Journal, as to my paper on "Some Methods of Estimating Tannins," and I think Mr. Allen's courteous letter demands a few words of explanation.

I did not of course imagine that a chemist of Mr. Allen's standing could be ignorant of the fact that acetate of lead precipitates gallic acid and colouring matter, as well as tannin, but although, as he remarks, this is rather an advantage than otherwise for the analysis of teas, it is fatal to its value for the estimation of tanning materials. Mr. Allen will not be surprised to learn that other and less experienced chemists had proposed it for this latter purpose, and writing simply as a tanner, it never occurred to me that it was necessary to point out its special applicability to tea-testing, as perhaps I should have done.

I had no expectation in writing the paper that it would find its way into the *Pharmaceutical Journal*, and in my experiments simply aimed at the unambitious though useful end of deciding which of the processes at present in use was most suited to the technical requirements of my trade.

It seems to me that Mr. Allen scarcely takes enough credit to himself for the indicator he proposed, for on it much of the value of the process depends, and in fact I believe that Prilram had previously suggested the use of acetate of lead.

North Shields. H. R. PROCTER.

J. B. L. Mackay.—(1) In an auriculate leaf the lobes are separated almost entirely from the blade, in a hastate leaf they are not. See Bentley 'Man. Botany,' p. 160, fig. 345, 346. (2) *Matricaria chamomilla* has a hollow conical receptacle, and *M. Parthenium* a shallow convex one. If our correspondent will compare the receptacle of a dried chamomile flower with that of the common garden feverfew, he will understand what is the difference between conical and convex. See also Pharm. Journ. [2] vol. i., p. 448, 449. (3) For the sake of uniformity the names adopted in Babington's 'Manual of British Botany' are those we prefer to use in speaking of British plants. (4) *Tanghinia venenifera*, Poir. (*a*) The contraction stands for Poiret, who is the author who described the plants. See Bentley, 'Man. Botany,' p. 379. (*b*) See 'Treas. Botany,' p. 1123, for description of its use, etc. (5) All the 29 forms of *A. Napellus* do not possess characters sufficiently distinct to be classed as *species*, and therefore do not rank as such. De Candolle describes 21 other *species* of *Aconitum*, most of which have also one or more forms. (6) The Linnæan system is scarcely ever used by British botanists at the present day.

"*A Student.*"—Apply to the Secretary for a copy of the pamphlet "Hints to Apprentices and Students."

"*Syrupus.*"—*Orobanche Picridis.*

W. H. P.—We are not prepared to decide "which is the best and most reliable application to produce whiskers," amongst so many competitive compounds.

W. Richardson.—*Myrrhis odorata*

F. A. Brown.—We are informed by the Secretary of the Chemists and Druggists' Trade Association that the appeal on the Apothecaries' Company *v.* Shepperly is entered for hearing in the Exchequer Division of the High Court of Justice on the 2nd of November next.

"*Inquirer*" is thanked for his correction. Ammonium bromide would be formed.

"*Chemicus.*"—(1) There is nothing to prevent a chemist and druggist mixing the ingredients of coloured fires, but he should be careful that in so doing and in their storage and sale he complies with the provisions of the Explosives Act. (See vol. vii. p. 417.) (2) We know of no law to compel you to label the bottle on the grounds stated.

L. Thompson.—*Lithospermum officinale.*

Errata.—In the number for June 23, p. 1040, col. i., line 19, *for* "anhydrous salicylic acid," *read* "anhydrous salicylate of soda;" line 13 from bottom, *for* "CRYSTALLIZED ACONITE," *read* "CRYSTALLIZED ACONITINE."

J. C. T.—Variations not unfrequently occur in these plant

A. P. Baker.—Probably the sale of the quinine at the low figure quoted was due to its purchase by the seller before the last rise in price. We have reason to believe that an alteration has now been made.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Hayton, Mr. Modlen, Mr. Angell, Mr. Johnson, Mr. Dyson, Mr. Pownall, Messrs. Mawson and Swan, Mr. Brown, Dr. Pavy, Mr. Haydon, Mr. Jones, Dispenser, Bricklayer, Inquirer, H. H., W. H. B., S. L. S.

THE TURPENTINES AND RESINOUS PRODUCTS OF THE CONIFERÆ.

BY DR. JULIUS MOREL,

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I. STRASSBURG TURPENTINE.

*Synonyms.**—L.: Lacryma Abiegna; Lacryma Abietis; Officinarum Germaniarum Terebinthina Veneta; Terebinthina Argentoratensis.—G.: Strassburger Terpenthin.—F.: Bijon du Dauphiné; Térébenthine de Strasbourg; Térébenthine d'Alsace; Térébenthine de Venise;† Térébenthine au Citron (commercial name in France).

Botanical Source.—Abies pectinata.‡

Abies, Plin., Hist. Nat., xvi. 18; Math., Valgr., 107; Clus., Hist. Pl., 24.

Picea, Dodon., Pempl., 863.

Abies fœminea, Elate, J. Bauh., Hist., i. 2, 231.

Abies conis sursum spectantibus, C. Bauh., Pin., 505.

Abies taxifolia, fructu sursum spectante, Tourne., Inst., 589.

Pinus Picea, L., Spec., 1420; Willd., Baumr., 217; Lamb., Pinet., ed. 2, i. 50, t. 32; Bieb., Fl. Jour. Cauc., ii. 409; Waldenb., Fl. Carp., 342; Gaud., Fl. Helv., vi. 190; Koch., Syn., 769; Aut., Conif. 68, t. 27, f. 1; Griseb., Spicileg. Fl. Rum., ii. 350; Stev., Bull. Soc. Nat. Mosc. (1838), 44.

Pinus Abies, Duroy, Obs. Bot. 39; Harbk. ed. 1, Borkhaus, Forstbot., i. 382; Endl., Syn. Conif., 59.

Pinus pectinatus, Lam., Fl. Fr., ii. 202.

Abies alba, Mill. Dict. No. 1 (*non* Mich.) Baumg., Fl. Transylv., ii. 306.

Abies taxifolia, Desf., Cat. Hort. Paris, ed. 3, 356; Hist. Arbr., ii. 579.

Abies pectinata, DC., Fl. Fr., ii. 279; Rich., Conif., 73, t. 16, f. 2; Forst., Pinet. Wob., 195; Link. in Linnæa, xv. 526; Hartig, Forstpfl., 26, t. 1; Schouw., Ann. Sc. Nat. 3e sér., iii. 239; Loisel, Nouv. Duham., v. 294, t. 82; Camer., Epit., 48-49, cum ic. (bene); Carr., Man. des Pl., iv. 336; Tr., Gén. Conif., 209.

Abies vulgaris, Poir., Suppl., vi. 514; Spach., Hist. Vég. Phaner., xi. 419.

Abies picea, Lindl., Penny Cycl., No. 1; Journ. Hort. Soc., v. 209.

Abies excelsa, Link., Abhand. Berl. Akad., 1327, p. 182.

Abies candicans, Fisch. MSS.

Abies argentea, De Chambr., Tr. Prat. Arb. Résin., 17, pl. i. f. 1-2, et pl. v. f. 1.

Picea pectinata, Loud., Arbor., W. 2329, f. 2237-2239; Encycl. of Trees, 1037, f. 1938-1939; Gord., Pinet., 191.

Picea taxifolia, Hort.

E.: Pectinate Fir Tree; Silver Fir; Spanish Fir.—G.: Weisstanne; Edeltanne, Pechtanne.—F.: Sapin de Lorraine; Sapin des Vosges; Sapin de Normandie; Sapin pectiné; Sapin argenté; Sapin à feuilles d'If; Sapin commun; Sapin blanc; Sapin en peigne.

This fir-tree is one that inhabits almost all the mountains of Central Europe, the Alps, Apennines, Pyrenees, certain mountains in the Forez and Loire departments, etc. It is very common in the Vosges, and in the Black Forest, where it constitutes high forests; sometimes it is met with in Transylvania. It is worked especially in the Vosges and in the Alps. A variety (*β. Cephalonica*) is met with in continental Greece and in the Islands of Eubœa and Cephalonica. The greatest elevation it attains is in Corsica at 1700 metres, in the Pyrenees at 1950 metres, in the Jura and Auvergne at 1500 metres. It seeks particularly fresh soil formed of detritus from granitic rocks, or in a state of transition and mixed with humus.

The bark of the silver fir loses its epiderm from the first year, laying bare its suberous envelope, which forms a superficial, thin, shining, tensile and smooth periderm, sometimes of a brownish yellow, but more often of a characteristic silver grey colour. The mesophlœum, which is below, is sprinkled with hollow glands in which the turpentine is elaborated and accumulated, the glands becoming ruptured and transformed into irregular lacunæ. The fluid in these glands is very limpid, colourless and viscous, and raises slightly the covering periderms in the form of a small tumour or blister, which, upon being pressed with the nail or a pointed instrument, is ruptured, allowing the contents to run out. Finally, the liber is composed of thin pearly white layers, the most superficial of which, when six to eight years old, are transformed into a reddish thick and ligneous cellular tissue.

The bark remains smooth and bright on the surface until an advanced age, 80 to 100 years, varying with the individuals. Then an internal periderm is developed on the exterior of the active layers of the liber, through which all that is outside becomes dry and constitutes a persistent increasingly cracked rhytidoma, the thickness of which increases with age, but rarely exceeds three to four centimetres.

The production of the internal periderm, by drying the green envelope, naturally arrests the secretion of turpentine, the volatile portion of which is evaporated. The resin becomes concrete, and, remaining in the rhytidoma, makes the bark of the fir one of the best of wood fuels.

The wood of the fir has only fibres and rays; the canals and resiniferous cells are absent, and consequently it has no decided odour.

Extraction. — It has been mentioned that the interior layer of the bark is furnished with a large number of resiniferous ducts, and that in the most external layers of the trunk there are formed larger lacunæ, called cellules or utricules, which in distending raise the suberous portion. These utricules are ruptured with the edge of a steel instrument and the oleo-resinous juice escapes. The turpentine is afterwards collected in bottles and filtered through bark funnels.

Characters.—This turpentine, when freshly collected, is liquid, whitish and milky, but it becomes clear after standing some time in the sun. It resembles Canadian balsam pretty closely, its colour being a pale yellow, but its odour is more agreeable. This odour is very pleasant and citron-like, which has given rise to its French name of "térébenthine au citron." Its taste is less acrid and less bitter than that of Canada balsam. It has the specific gravity of distilled water. It rotates the plane of polarized light 3° to the left, when examined either in the pure state or previously diluted with one-fourth of its weight of benzine. It is soluble in ether, chloroform, benzine and hot amylic alcohol.

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* L = Latin, E = English, G = German, F = French names.

† The name *Térébenthine de Venise* has no foundation, except it may be that the substance passed as an article of commerce through that city when at the height of its splendour. Possibly, however, this name should be borne by Strassburg turpentine and not by the larch turpentine. In fact, Dodonœus and most ancient authors designate it thus, and give the name "*larice*" to the larch turpentine.

‡ In the Botanical Synonymy here given the author has followed closely Carrière, 'Traité Général des Conifères,' 1867. He also desires to express his indebtedness to the authors of 'Pharmacographia," for assistance derived from that work in the compilation of these papers.

In glacial acetic acid, absolute alcohol and acetone, it dissolves without giving an abundant flocculent precipitate. Its solution in ordinary alcohol, also, is only slightly turbid, a granular precipitate separating upon standing. All the solutions have an acid reaction. Examined under the microscope it shows, especially with polarized light, the presence of numerous crystals of abietic acid.

Strassburg turpentine possesses very marked siccative properties. When exposed to the air there is formed on its surface after a short time a hard brittle crust. If spread out in thin sheets it hardens and solidifies completely. Mixed with one-sixth of its weight of calcined magnesia it acquires a pilular consistence.

Composition.—In 1830, Caillot, who discovered abietine, a crystallizable principle, in Strassburg turpentine, represented the composition of this product as follows:—

Volatile Oil	33·50
Resin, insoluble in Alcohol	6·20
Abietine	10·85
Abietic Acid (resin acid)	46·39
Aqueous Extract (containing succinic acid)	0·85
Loss	2·21
	100·00

Flückiger has found in it 72·4 per cent. of resinous matters (sylvic acid, pinic acid, etc.) and 24 per cent. of an essential oil, boiling at 163° C. and rotating the plane of polarized light 8° to the right. The proportion of essential oil contained in Strassburg turpentine would appear therefore to be very variable. In 1865, Rochleder found in the leaves of the plant a kind of sugar approaching to mannite, to which he gave the name "abietite;" its composition is represented by the formula, $C_{12}H_{16}O_6$.

II.—CANADA BALSAM.*

Synonyms. — E.: Canadian Turpentine. — G.: Canada Balsam.—F.: Baume du Canada; Térébenthine du Canada; Térébenthine du Sapin baumier; Faux baume de Giléad.

Botanical Origin.—Abies balsamea.

Abies foliis solitariis, confertis, obtusis, membranaceis, Clay., Virg., 191; Gronow, Virg. 152.

Abies minor, pectinatis foliis, Virginiana, conis parvis, subrotundis, Pluckn., Almag. ii. 121, f. 1; Ray, Dendrolog. 1; Duham, Arbr. i. 3.

Pinus balsamea, L., Spec., 1421; Wangenh, Beitr. 40; Duroi, Harbk. ed. Pott., 144; Willd., Baumr. 276; Lamb., Pinet., ed. 2, i. 52, t. 33; Ant. Conif. 66, t. 26, f. 3, Endl., Syn. Conif. 103.

Abies balsamifera, Mich., Fl. Bor. Amer. ii. 207; Mich. fil., Arbr. For., i. 145, t. 14.

Abies balsamea, Mill., Dict., No. 3; March, Arbr., 102; Rich., Conif., 74, t. 16; Forb., Pinet. Wob. 109, t. 37; Link. in Linnæa, xv. 530; Lindl. and Gord., Journ. Hort. Soc., v. 210; Desf., Hist. Arbr., ii. 579; Loisel, Nouv. Duham., v. t. 83, f. 2; Spach., Hist. Veg. Phan., xi. 421; Carr., Man. des Pl., iv. 337; Tr. Gén. Conif., 217.

Abies taxifoliis, Hort. Angl. ii. 2.

Abies balsaminea, N. Duham., v. 295.

Picea balsamea, Loud., Arbor., iv. 2339, f. 2240-2241; Encycl. of Trees, 1844, f. 1952-1954 (ic.); Knight, Syn. Conif., 39; Gord., Pinet., 163; Henk. and Hochstt., Syn. d. Nadelh. 176 (excl. syn. Raffin).

Pinea balsamea, Rich. ex. Gord., Pinet. Suppl. 47.

E.: Balm of Gilead Fir; American Silver Fir; Balsam Fir.—G.: Balsamtanne; Balsamfichte.—F.: Baumier de Giléad; Sapin baumier de Giléad.

The *Abies balsamea* is a fine tree, which attains a height of 20 to 40 feet, the trunk having an average thickness of 6 to 12 inches. It grows abundantly in the United States, in Nova Scotia, and in Canada. It resembles the *Abies pectinata* of Europe, but the cones are more acute at the summit.

The turpentine of the *Abies balsamea* is also yielded by the *Pinus Fraseri*, the small-fruited or double balsam fir of the Americans. Pursh found this tree on high mountains in Carolina, resembling the *Pinus balsamea* in several respects, but differing at first sight in being a smaller tree, the leaves shorter and more erect, and the cones not one-fourth the size.

The *Pinus* or *Abies Canadensis* (Canada Pine or Hemlock Spruce Fir), grows in the same countries as the *Abies balsamea*, and appears to contain an analogous turpentine.

Extraction.—In this plant the secretory canals are distributed in nearly the same manner as in the *Abies pectinata*, and the turpentine is extracted in a very similar way. Upon piercing the utricules, which cause a protuberance in the exterior layers of the bark, the oleo-resinous juice runs out, and it is filtered in the sunlight.

Characters.—When it is fresh, Canada turpentine is turbid, like Strassburg turpentine, but like it gradually clarifies and becomes transparent. Its colour is pale yellow, with a greenish tinge, becoming duller and darker in time, but still retaining its transparency. The odour is stronger and more agreeable than that of Strassburg turpentine; to the taste it is slightly acrid and bitter, but not disagreeable. Exposed to the air it dries like Strassburg turpentine, but its colour becomes perceptibly darker. This modification in the colour and its odour, constitute the characters by which it can be distinguished from the preceding species.

When examined carefully in direct sunlight Canada turpentine exhibits a slight green fluorescence like other turpentines, or copaiba balsam. This optical property becomes more pronounced when the turpentine is previously heated to a temperature of about 200° C. Examined under the microscope it does not present the crystalline and granular structure observed in some other turpentines, and in this respect it resembles Venice turpentine.

At 14·5° C. the specific gravity of Canada turpentine is 0·998, distilled water having a specific gravity of 1·000 at the same temperature. Mixed in the proportion of 4 parts of the turpentine with 1 part of benzine, and examined in a 50 mm. tube, it rotates the plane of polarized light 2° to the right. This dextrogyre power is also characteristic of the resin, which, according to Flückiger, rotates the polarized beam 8·5° to the right, whilst the essential oil has a rotatory power in the contrary direction.

Canada turpentine is soluble, in all proportions, in chloroform, benzine, ether and hot amylic alcohol; in each case the solution is acid and reddens litmus.

* Although this turpentine is known best by this name, the author, together with most pharmacologists, protests against the term balsam being applied to other substances than drugs containing an essential oil, and one or more volatile acids, such as benzoic or cinnamic acids. It is therefore in error that the name of balsam has been retained in commerce for this Canadian turpentine, since it contains no volatile acid. In consequence of its pleasant odour, it has also been called "balsam of Gilead," but this is equally wrong, as that name applies to the "Mecca turpentine," yielded by the *Balsamodendron Gileadensis*, belonging to the order Terebinthaceæ, and growing in Arabia.

It dissolves readily in carbon bisulphide, but this solution is a little turbid. Glacial acetic acid, acetone, and absolute or 70° to 75° alcohol dissolve it partially, and after boiling followed by a slow cooling give up a large quantity of amorphous residue. Colophane and Venice turpentine dissolve completely in these menstrua. One-fifth of its weight of recently calcined magnesia readily brings it to a pilular consistence; the mixture treated with dilute alcohol and kept during some days at a temperature of 93° C., with very frequent agitation, yields a hard mass that at last becomes transparent.

Composition.—Several analyses of this oleo-resin have been published, that of Bonaster being the oldest, and that of Flückiger the most recent.

Bonaster's Analysis.

Volatile Oil	18·6
Resin soluble in Alcohol	46·0
Sub-resin, slightly soluble in Alcohol	33·4
Soft Resin, similar to the sub-resin	4·0
Bitter Extractive, Salts, and traces of Acetic Acid	4·0

Flückiger's Analysis.

Volatile Oil	24·0
Resin, soluble in Absolute Alcohol	59·8
Resin, insoluble in Absolute Alcohol, but soluble in Ether	16·2
	100·0

Wirzen, who has also made a recent analysis, found 16 per cent. of volatile oil and three amorphous resins, one of which had the composition of abietic acid.

These analyses show that the composition of Canada turpentine is not constant. Flückiger made the quantitative determinations of the volatile oil by heating the turpentine in a water-bath during several days; the same specimen distilled with water yielded only 17 to 18 per cent. of volatile oil.

NOTES ON INDIAN DRUGS.

BY W. DYMOCK.

(*Continued from Vol. VII., page* 979.)

POLYPODIUM QUERCIFOLIUM.—*Local Names*, KADIC PAN, *and* KALI PANDAN.

A parasitic fern, found upon the roots of trees and widely distributed. The part used medicinally is the rhizome, to which are attached the bases of the fronds and numerous thick radicles, all of a black colour. The rhizome is about as thick as the little finger; when broken across it is seen to consist of a black parenchyma in which are several bundles of vessels of a lighter colour. These can be separated from the canals in which they are situated without much trouble when the rhizome is fresh. Under the microscope the cell walls of the parenchyma appear of a dark brown colour, and the vascular bundles are seen to consist of large scalariform vessels. When at Goa a short time ago, I found this drug in all the shops, and was informed that it is considered a valuable alterative in cases of prolonged malarious fever: it has an astringent and slightly bitter taste. It does not appear to be known as a medicine in Bombay.

PRANGOS PABULARIA.—*Local Name*, FATURASALIYUN.

The fruit consists of a pair of mericarps about ¼ of an inch long, which together form an elongated oblong body crowned by the stylopodium and calycinal teeth; each mericarp has five very prominent convoluted ridges. The margins of the seed are curved inwards, so that a transverse section shows a horseshoe-shaped object, surrounded by about forty vittæ, full of yellowish brown essential oil. The taste is at first somewhat like anise, but afterwards bitter. It is used by the Hakeems as a stimulant and carminative; it is also said to promote the expulsion of the fœtus. Faturasaliyun is an Arabic corruption of Petrosilinum; it is still further corrupted by the Bombay druggists into Phuttersalum.

ACONITUM, Sp.?—*Local Names*, WAKMA *and* BIKHMA

Tuberous roots of a light brown colour, resembling those of *Aconitum Napellus* in size and shape; they break with a short fracture, and the interior is either white and farinaceous, or horny and yellowish. Both the horny and farinaceous roots have a pure bitter taste, as persistent as that of quinine, without any acridity. The roots when soaked in water have a pungent smell like nasturtium. They do not resemble any of the varieties of aconite described by Mr. Moodeen Sheriff ('Supplement to Pharmacopœia of India,' pp. 25, 32, 265). They may or may not be included in the numerous varieties of aconite noticed in the Makhzan ul Adwiya and other Persian and Arabic works on Materia Medica, under the heads Bish and Judwar. The descriptions are not sufficiently minute to determine this point. Microscopic structure:—The parenchyma is composed of large oblong thin-walled cells loaded with starch; the vascular bundles, which consist of scalariform vessels, are about twelve in number. In the young tubers they are crowded together towards the centre; in the old ones they occupy the circumference. This drug is new to me, and is little known in Bombay. A considerable parcel was brought here a short time since by a Brahmin from Maugrole, who would not say where it came from. He has written a pamphlet to explain its properties, the most remarkable of which are, that it is said to stop vomiting or purging, and allay pain in the abdomen. The dose, according to our Brahmin, is two grains. Dr. Sakharam Arjun, a graduate of the University of Bombay, practising here, tells me that he is acquainted with the drug, and that he considers it to be a powerful bitter and antiperiodic. He believes it to be the root of *Aconitum palmatum*.

NAREGAMIA ALATA.—*Local Names*, TINPANA *and* KAPUR BHENDI.

This is the country Ipecacuanha or Trifolio of the Portuguese at Goa. It is a small woody shrub, seldom more than 6—8 inches high, consisting of several slender stems, sparingly branched, rising from a spreading root-stock, which is contorted, knotty, and warty. The leaves are alternate, mostly situated at the ends of the branches, and consist of a narrow winged petiole ¾ to 1 inch long, at the end of which are articulated three small cuneate obovate leaflets. The ends of the shoots and buds are seen under the microscope to be thickly covered with white simple hairs; the petiole and leaflets are nearly free from them. The flowers are large and white, on axillary peduncles; the capsules 3-angled and 3-valved. The drug consists of the creeping root with the small stems attached, the leaves having been stripped off. A section of the root examined microscopically presents a tolerably thick dry suberous layer of a brown colour; immediately within this, the parenchyma, which is composed of thin walled cells, is much loaded with a yellowish oil. In the inner portion of the bark the cells contain starch; the wood is very hard and of a greenish yellow colour. The drug has a somewhat pungent aromatic odour, but hardly any taste; it is given as an emetic in doses of from 12—18 grains. Trifolio is abundant in the Southern Concon and Goa territory on the banks of nullahs.

METHONIA SUPERBA.—*Local names*, VINDAI *and* NAGKARIA.

This beautiful climbing plant, which adorns the hedges at the end of the rainy season, has a tuberous cylindrical or flattened root, often 7—8 inches long, and about one inch in diameter. It consists of two tubers which unite at a right angle, one being much smaller than the other. At the point of union may be seen, on the upper surface, a circular scar marking the attachment of the stem, and on the under surface immediately beneath it another, to which a tuft of thin rootlets is often attached. The tubers are covered with a brown epidermis except at the point, which is tapering and nearly white, like the growing part of a young kidney potato. Internally they are juicy, white and farinaceous, and have a faint acrid odour like potatoes. The taste is mucilaginous, feebly bitter, and a little warm and acrid. Examined microscopically, the root is seen to consist of large starch granules, principally oval, contained in very delicate thin-walled cells. The vascular bundles are few, and are composed of spiral and pointed vessels. The epidermis is an exuvium of the delicate cellular structure compressed and discoloured. Mr. Moodeen Sheriff finds this drug to act as an alterative tonic and antiperiodic. He has given it in 12-grain doses without its producing any disagreeable symptoms. Popularly it is considered poisonous, and is said to be sometimes criminally administered to cattle in this neighbourhood. A small piece is said to be a certain remedy for worms in cattle.

TRIBULUS TERRESTRIS.—*Local name*, CHOTA GOKHROO.

This plant is well described by Ainslie, he says: "The species in question is a common plant near the Dardanelles, and called in modern Greek Τριβόλια; it has a slender fibrous root, from which spring four to five delicate stalks, spreading flat on the ground; these are hairy and extend 2½ feet in length; the leaves are pinnated, leaflets five to six pairs nearly round. The flowers are axillary on short peduncles, and composed of five broad obtuse yellow petals; these are succeeded by a roundish five-cornered fruit, about the size of a marble, armed with prickles, the bane of travellers; this ripening divides into five cells, each armed with four strong sharp thorns, and containing several seeds." The latter part of this description has been slightly altered, as it was incorrect. The cocci are wedge shaped, yellowish when ripe; the external convex surface being rough between the thorns. When all five are *in situ* the fruit presents ten thorns pointing towards the peduncle, and ten pointing outwards round the circumference; the latter are developed first. This may account for the statement in some books, that each coccus has only two spines. The seeds are oily, and enclosed in very hard stony cells. Chota Gokhroo is always to be obtained in the shops. It is valued as a diuretic. The taste is rather agreeable.

POLYPODIUM VULGARE.—*Local name*, BASFAIJ.

The dried rhizome occurs in pieces of various lengths, and of the thickness of a quill. It is flattened, of a yellowish-brown colour externally, green internally, but when old, yellowish; the upper surface is studded with tubercles, to some of which a portion of the base of the frond still adheres. The under surface is more or less spinous from the remains of broken radicles. The taste is sweetish, astringent, nauseous, and somewhat acrid; odour ferny. Under the microscope the rhizome is seen to consist of a delicate cellular structure containing much starch and green granular matter; it is traversed by large bundles of scalariform vessels. Analysed by Dêsfosses, it was found to contain a complex substance, partly resinous and partly oily, a fermentable sugar, a substance analogous to sarcocolla, an astringent matter, gum, starch, albumen, and salts of lime and magnesia. Confer. Guibourt, vol. 2, p. 71, where there is a good figure of the drug. Basfaij is aperient and deobstruent, and is considered to act as an expellant of peccant humours; it is also used as an alterative in a variety of disorders; it is frequently combined with cassia pulp and honey. The Mahomedan Hakeems use it largely. It is the Polupodion of the Greeks, and the Azras ul Kalb of the Arabs; the latter name, which may be translated Dog's Tooth Fern, is given to it on account of the toothed appearance of the fronds.

MELIA SUPERBA.—*Local names of drug*, KALA KHAJUR, or KURROO KHAJUR.

The dried fruit of this tree is sold in all the shops under this name, which means black or bitter date. In size, shape, and colour it is very much like that fruit, but upon closer examination the pulp is found to adhere firmly to a large and very hard stone. The remains of the peduncle may also be seen to be different from that of a date. When soaked in water it soon loses its shrivelled appearance, and becomes like a large oval yellowish green plum. The skin is now seen to be thick and easily separated from the pulp, which consists of a delicate parenchyma supported by fibrous bands attached to the stone. The apex of the fruit is blunt, and studded with small tubercles. At the base is attached the five-partite calyx and a small portion of the fruit stalk. The stone is an inch in length, obscurely five-furrowed, oblong, perforated at both ends; apex five-toothed round the perforation, five-celled; seeds solitary, lanceolar, attached from the apex; perisperm in small quantity; embryo straight, inverse; cotyledons lanceolate; radicle oval, superior. The seed is ¾ of an inch long, and ⅛ of an inch broad; testa dark brown or black, polished; kernel very oily, sweet tasted. Under the microscope the cells of the fruit pulp are seen to be full of oil globules and fine granular matter, and the skin to consist of one row of columnar cells covered by a horny epidermis. This drug has a bitter nauseous taste. It is a favourite remedy amongst the labouring classes for colic; half a fruit is the dose for an adult. It appears to have hardly any purgative properties, but is said to relieve the pain most effectively. The *Melia superba* is a native of Soonda, and a large forest tree.

PERISTROPHE BICALYCULATA.—*Local name*, GHATI PITPAPRA.

The whole herb is gathered when in flower and dried. Stem much branched, six sided, rough, covered with white jointed hairs; leaves ovate, acuminate, rough, a few jointed hairs scattered here and there; peduncles axillary; branches dichotomous; flower heads 1–1½ inches long, flowers small, pink; root slender, long, woody, straight, with numerous slender stems rising from the crown. This is a small plant, and very abundant in the rainy season. It has a faintly bitter disagreeable taste, and is used as a substitute for *Fumaria parviflora*, the true Pitpapra.

(*To be continued.*)

SANTONIN.*

BY E. MARLETT BODDY, F.R.C.S., ETC.

There is no doubt that santonin is, for many reasons, by far the most efficient anthelmintic which can possibly be administered to children, and its combination with calomel I have found to be most advantageous in every respect. Santonin, like every other therapeutic agent, requires care in its administration; and if it is allowed to remain in the system it acts deleteriously, like certain cumulative medicines. This pernicious after-action one of course seeks as much as possible to obviate, and the only way to do so as regards santonin is to combine it with some purgative, such as calomel, which carries it off.

According to Falck of Marburg, if santonin is allowed to remain in the system we get a substance called xanthopsin, into which santonin is supposed to be transformed under certain circumstances which at present are not well ascertained. This xanthopsin is excreted by the urine, giving it a remarkable yellow colour, causing a similitude to that secretion passed in jaundice, and its presence there is easily detected by caustic alkalies, which redden the urine. No doubt it is this xanthopsin which gives rise to those dangerous symptoms that have been so largely dilated on of late, and which many attribute to santonin only, forgetting or ignoring the presence of xanthopsin; and this mischievous action I have found from experience to be entirely counteracted, or rather prevented, by administering calomel at the same time.

I generally administer santonin combined, as I have just said, with calomel, or I give it preceded and then followed by that drug; but one plan is as good as the other. The results of so giving this anthelmintic in either of these two modes have been most happy, and I have very seldom found it necessary to repeat the dose, for such treatment is thorough, and consequently precludes the necessity of repetition.

I myself have never had a case where convulsions or retention of urine have originated from santonin; in fact, I have never seen any untoward symptom resulting from it in any way whatever, which I attribute to my combining it with calomel, or preceding and following it up by that purgative.

My experience has convinced me that nothing of a deleterious tendency can possibly accrue from santonin if it is combined with calomel, for by so doing we do not allow sufficient time to elapse for the xanthopsin to act on the system, for when the santonin has done its work the calomel removes it. The latter drug is a more searching purgative than castor oil; being likewise a cholagogue, it causes a greater secretion of bile, which, as my readers know, is the natural purgative. Giving the santonin in one of these two methods aforementioned will entirely prevent all dangerous symptoms arising; there will be no convulsions and no retention of urine, nor will that secretion appear like that found in jaundice, for this one simple reason: the santonin, when it has done its work, is eliminated from the system by the calomel, and consequently the poisonous xanthopsin has not sufficient time to form. Perhaps this substance is the cause of patients seeing objects either yellow or green in colour.

* From the *Medical Times and Gazette*, July 7, 1877.

FORMULÆ FOR NEW MEDICAMENTS ADOPTED BY THE PARIS PHARMACEUTICAL SOCIETY.

(*Continued from Vol. VII., page 1064.*)

DIASTASE.

Malt, the germination of which is two-thirds the length of the grain, and which has been dried at 50°C., is ground in a mill and treated with two parts of water at the ordinary temperature, stirring from time to time; after six hours' contact it is strained and pressed, and the liquor filtered is added to twice its volume of 95° alcohol. The precipitate formed is collected on filters, spread in thin layers upon glass plates, and dried rapidly in a current of air at a temperature of 45°.

Test.—0·05 gram of diastase added to 200 grams of paste containing 10 grams of starch yields a liquid filtering very rapidly, and decolorizing five times its volume of Fehling's solution.

CRYSTALLIZED DIGITALIN (*Digitaline cristalisée*).

Digitalis Leaves, from the Vosges, in rather fine powder, 1000 grams; Neutral Lead Acetate, 250 grams; Distilled Water, 1000 grams. The digitalis should be collected in its second year just when the first flowers appear. With respect to the lead acetate, it is very important that it should not have an alkaline reaction; a slight acidity would be preferable. The lead salt is dissolved in the cold water, the powder added and thoroughly mixed, the whole passed through a sieve and left in contact twenty-four hours, taking care to mix it from time to time. The mixture is then packed sufficiently in a displacement apparatus, and exhausted with 50° alcohol until it no longer yields any bitterness. About six parts of liquor are thus obtained, and this is neutralized exactly with sodium bicarbonate dissolved to saturation in cold water; about 25 to 30 grams will be required. When effervescence ceases, the alcohol is distilled, and the liquor remaining is evaporated in a water-bath down to 2000 grams; it is then left to cool and diluted with its weight of water. Two or three days afterwards the clear liquor is decanted off by means of a siphon, and the precipitate drained upon a linen filter. When freed from the extractive liquor the precipitate weighs about 100 grams. It is suspended in 1000 grams of 80° alcohol and the whole passed through a metal sieve or fine cloth; the turbid liquor obtained is heated to ebullition, and to it is added a solution containing 10 grams of neutral lead acetate; the heating is continued a few moments, and the liquor is then left to cool and filtered. The deposit on the filter is washed with alcohol to remove any liquor it may retain and then pressed. To this liquor is added 50 grams of finely powdered vegetable charcoal that has been washed with acid and afterwards with water until quite neutral, and it is then distilled, the residue being heated for some time in a water-bath, it being very important that all the alcohol should be driven off. A little water is added to replace what may evaporate. The residue is allowed to cool, then drained upon the cloth that was used to separate the precipitate, and the carbonaceous mass is washed with a little water to remove the last portion of the coloured liquor. The carbonaceous residue is then dried completely in a stove at a temperature not exceeding 100°C., and exhausted by displacement with pure chloroform until it passes colourless. This liquid is distilled to dryness, and a few grams of 95° alcohol are placed in the retort and evaporated to drive off the last traces of chloroform.

The residue is crude digitalin with viscous and oily matter. It is dissolved with heat in 100 grams of 90° alcohol, and 1 gram of neutral lead acetate dissolved in a little water added, together with 10 grams of animal charcoal in fine granules without powder that has been treated with hydrochloric acid and washed until the washings are no longer acid. After boiling for ten minutes it is allowed to cool and settle, and then filtered in a glass cylinder furnished with a tight cotton plug, through which it passes quickly and clear. The black deposit is added last, and exhausted of all bitterness with alcohol. After distillation, the digitalin remains as a grumous crystalline mass, now only contaminated with the coloured oil. A little aqueous liquor that occurs with it is separated and the weight of the impure digitalin is taken in the previously tared vessel. The digitalin is then dissolved with heat in exactly sufficient 90° alcohol for its solution (from 6 to 12 grams). Any alcohol evaporated is replaced, and then to the cooled solution is added sulphuric ether, rectified at 65°, to half the weight of the alcohol employed; after mixing, distilled water equal to the weight of the alcohol and ether combined is added, and the flask is closed and shaken. Two layers are formed: the upper is coloured, and consists of the ether which has taken up the fat oil; the lower is colourless, and contains the digitalin, which being now free, quickly crystallizes. The flask is placed in a cool place. Two days afterwards the whole is thrown into a small cylinder furnished with a moderately tight cotton plug: the mother liquor runs off, and then the coloured layer, and the small quantity that remains adherent to the crystals is removed by a little ether.

Thus obtained, this first crystallization of digitalin is slightly coloured; it is sufficiently pure, however, for its weight to be taken in an analysis, one-tenth being deducted for the digitalin it still contains. To obtain it perfectly white two purifications are necessary, but first a treatment with chloroform is indispensable to separate the remainder of digitalin which injures its purity.

The digitalin, well dried and reduced to a fine powder, is dissolved in 20 parts of chloroform and the solution is filtered in a cylinder through a tight cotton plug. The liquor passes limpid; it is distilled to dryness, and a little alcohol is poured into the retort and evaporated to remove the last traces of chloroform. This digitalin is dissolved in 30 grams of 90° alcohol, 5 grams of washed granular animal black added, and the whole boiled for ten minutes; the liquor is filtered and the charcoal exhausted as before indicated; and lastly it is distilled: the digitalin in dry crystals is found on the sides of the vessel, but it is still slightly coloured. To obtain it perfectly white it is dissolved with heat in exactly sufficient 90° alcohol (about 6 to 8 grams); to the solution is added ether equal to half the weight of alcohol employed and double the quantity of distilled water, and the flask is closed and agitated; the crystallization commences quickly. The ether does not separate. It is exposed to the coolness of the night, and by the next day nearly the whole of the digitalin is deposited in small groups of white needles, that which retains colouring matter remaining in the mother liquor. The whole is thrown into a cylinder and the crystals washed with ether as before described.

1000 grams of Vosges digitalis of good quality yields about 1 gram of crystallized digitalin.

Digitalin occurs under the form of very white light crystals, consisting of short slender needles grouped around the same axis. It is very bitter, and scarcely soluble in water. 90° alcohol dissolves it well; anhydrous alcohol dissolves it less freely. Pure ether dissolves only traces. Chloroform is its best solvent. Brought into contact with a small quantity of concentrated hydrochloric acid digitalin is coloured emerald green, and this reaction is favoured by a very slight heat.

Granules (Granules de digitaline cristalisée).—Crystallized Digitalin, 0·025 gram; Powdered Sugar of Milk, 4 grams; Powdered Gum Arabic, 0·90 gram; Syrup of Honey, q.s. Triturate the digitalin in a porcelain mortar for some time with the milk sugar, and make 100 silver-coated granules each containing ¼ milligram.

Emulsion of Medicaments insoluble in Water.

In these preparations a tincture of quillaya (1 to 5) is employed. It is prepared by digesting together 100 grams of bark of *Quillaya saponaria* and 500 grams of 90° alcohol, heated by a water-bath for half an hour at nearly boiling temperature; after this the ingredients are allowed to macerate for forty-eight hours, with occasional stirring, and filtered.

Emulsion of Tolu Balsam.

Dissolve 2 parts of Balsam of Tolu in 10 parts of 90° alcohol, add 10 parts of Tincture of Quillaya, and then 78 parts of hot water.

Emulsions of copaiba balsam, tar, oil of Cade, etc., may be prepared by the same method.

Eucalyptus Globulus.

All the parts of this tree, but especially the leaves, are impregnated with an aromatic volatile oil, having the odour of oil of peppermint, but of a special character. It breaks up into two principles: eucalyptol ($C_{12}H_{18}$) and eucalyptene ($C_{12}H_{20}O$). This latter substance, which is the most important in the treatment of pulmonary catarrh, appears to be free from the irritant properties presented by the undecomposed volatile principle. Eucalyptol is miscible in water, and soluble in ether and alcohol.

The *Powder*, *Infusion*, *Wine*, *Elixir* and *Extract* are prepared in the same way as the corresponding preparations of coca (see vol. vii., p. 1064.

Distilled Water (Eau distilée).—Dry leaves 1 part, and sufficient water to yield 4 parts of product.

Syrup (Sirop d'Eucalyptus).—Infuse 50 grams of Eucalyptus Leaves in 250 grams of Water; after three hours strain and press; filter the product and bring it up to 250 grams; then add 100 grams of Distilled Eucalyptus Water, and melt in it 650 grams of sugar under a covered water-bath.

Bromide of Iron.—$FeBr_2$.

Iron Filings, 40 grams; Distilled Water, 216 grams; Bromide, 80 grams. Introduce first the water and then the bromine into a flask, and add the iron filings a little at a time. Towards the end, to complete the reaction, heat should be applied until the liquor is of a fine green colour. When the combination is complete, pour the whole, including the excess of iron, into a stoppered bottle. This normal solution cannot be preserved long without alteration. It should therefore be used as promptly as possible under the form of syrup and especially of pills. 1 gram of pure bromide of iron is completely precipitated by 1·56 gram of silver nitrate.

Pills (Pilules de bromure de fer).—Normal Solution (filtered) 15 grams; Porphyrized Iron Filings, 0·10 gram; Powdered Gum Arabic, q. s.; Liquorice Powder, q. s. Place the solution and the iron in a porcelain capsule, and evaporate quickly until the liquor has lost two-thirds of its weight; then pour it still hot into a very dry and slightly warmed porcelain mortar; add the powders previously mixed and in quantity sufficient to form a tolerably consistent pill mass, which divide into 100 pills and roll in lycopodium. The pills can also be covered with a mixture of gum and sugar and kept in a well dried flask.

Each pill contains 0·05 gram of bromide of iron.

Syrup (Sirop de bromure de fer).—Normal Solution, 15 grams; Syrup of Gum with Orange Flower, 985 grams.

20 grams of this syrup, or one tablespoonful, contains 10 centigrams of bromide of iron.

FERROUS CHLORIDE (*Protochlorure de Fer*) $FeCl_2$.

Dilute pure hydrochloric acid with its volume of water, add pure iron filings, and heat slightly towards the end of the operation. When the evolution of hydrogen has ceased, filter and evaporate to dryness as rapidly as possible. The product is anhydrous ferrous chloride.

If the liquor suitably concentrated be left to cool, greenish crystals, derivatives of an oblique rhomboid prism, are formed, having for a formula, $FeCl_2,4H_2O$.

Syrup (Sirop de protochlorure de fer).—Syrup of Gum, 800 grams; Syrup of Orange Flowers, 175 grams; Orange Flower Water, 20 grams; Dry Ferrous Chloride, 5 grams. Dissolve the ferrous chloride in the orange-flower water, and add the solution to a mixture of the two syrups.

20 grams of this syrup, or one tablespoonful, contains 0·10 gram of iron salt.

Pills (Pilules de protochlorure de fer).—Dry Ferrous Chloride, 10 grams; Powder of Marsh Mallow Root, 10 grams; Mucilage, q. s. F. S. A. 100 silvered pills, each containing 0·10 gram of iron salt.

DIALYSED IRON (*Oxide de fer dialysé*).

Solution of Ferric Chloride (sp. gr. 1·245), 100 grams; Solution of Ammonia (sp. gr. 1·169), 35 grams. Add the ammonia in small quantities to the ferric chloride; at first the precipitate formed is redissolved very rapidly, but afterwards disappears more slowly. When the liquor has again become transparent it is introduced into the dialyser; the distilled water in which the vessel containing the ferruginous solution is placed must be frequently renewed. After a time the highly coloured solution is no longer precipitated by silver nitrate and gives no acid reaction. It is then absolutely free from the disagreeable taste of certain ferruginous preparations. A small quantity of hydrochloric acid always remains in the liquor, which may be shown by precipitating the oxide of iron by a slight excess of ammonia, filtering, adding an excess of nitric acid, and then silver nitrate. 10 c.c. are evaporated, and from the residue must be calculated how much distilled water is required to be added to produce a 10 per cent. solution.

SOLUTION OF FERROUS CHLORHYDROPHOSPHATE (*Solution chlorhydrique de phosphate de protoxide de fer*).

Ferrous Chloride, 5 grams; Phosphoric Acid (sp. gr. 1·45), 5 grams; Distilled Water, q. s. to make a litre.

20 grams of this solution contain 0·10 gram of salt of iron.

SYRUP OF FERROUS CHLORHYDROPHOSPHATE (*Sirop de chlorhydrophosphate de protoxyde de fer*).

Ferrous Chloride, 5 grams; Phosphoric Acid (sp. gr. 1·45), 5 grams; Distilled Water, 350 grams; Powdered Sugar, 640 grams. Dissolve the ferrous chloride in the distilled water, add the phosphoric acid, and melt the sugar at a gentle heat.

20 grams, or a tablespoonful, of this syrup contains 0·10 grams of salt of iron.

The Syrup and Solution of Ferric Chlorhydrophosphate may be obtained by substituting the ferric for the ferrous salt.

SOLUTION OF PYROPHOSPHATE OF IRON AND SODA.

Pyrophosphate of Soda, 25 grams; Dry Ferric Sulphate, 5 grams; Distilled Water, q. s. to make 1 litre. Dissolve the pyrophosphate of soda in 250 grams of water and the ferric sulphate in 100 grams; add, while stirring, the ferric solution to the solution of pyrophosphate, and to the limpid and colourless solution add sufficient distilled water to make a litre.

20 grams of this solution contain 0·10 grams of salt of iron.

SYRUP OF PYROPHOSPHATE OF IRON AND SODA.

Pyrophosphate of Soda, 25 grams; Dry Ferric Sulphate, 5 grams; Distilled Water, 350 grams; Sugar, 620 grams. Make the solution and dissolve the sugar in it by the aid of a water-bath.

20 grams of this syrup, or a tablespoonful, contain 0·10 of salt of iron.

CALABAR BEANS.

Powder.—Crush and dry the beans in a stove. Then triturate in a covered mortar and pass the powder through a sieve of fine silk. The pulverization leaves scarcely any residue.

Tincture (Teinture de fèves de Calabar).—Powder of Calabar Bean, 100 parts; Alcohol (80°), 500 parts. Macerate during ten days, strain with pressure, and filter.

ESERINE.

Powder of Calabar Bean, 100 parts; Tartaric Acid, 1 part; Potassium Bicarbonate in powder q. s.; Alcohol (90°), q. s.; Rectified and Washed Ether, q. s. Exhaust the bean mixed with the tartaric acid by several digestions in alcohol at the heat of a water-bath, alcohol equal to about three times the weight of the powder being used for each maceration. Distil the combined liquors and filter; heat the residue in a water-bath exposed to the air until it contains no more alcohol. After cooling suspend the extract in a small quantity of distilled water and filter through paper to separate the insoluble resin. Agitate the filtrate with rectified and washed ether until the ether is no longer sensibly coloured; two or three treatments are usually sufficient. Treat the aqueous liquor, which contains the eserine in the state of acid tartrate, with a slight excess of potassium bicarbonate, until the reaction is alkaline. Shake this liquor several times with ether, which removes the liberated eserine and deposits it upon evaporation. The product is purified by fresh crystallizations from ether.

Pure eserine is colourless, or slightly rose coloured; it crystallizes in thin laminæ having a rhomboid form. Most frequently it occurs in commerce under the form of yellowish spangles, or amorphous masses more or less coloured by the action of the air.

It is slightly soluble in water, but dissolves freely in alcohol, ether, and chloroform. When a 1 per cent. solution of it is treated with potash or soda it rapidly acquires a characteristic rose colour. Heated in a flask in a water-bath in contact with excess of ammonia, it gives upon evaporation of the liquor in the open air a magnificent blue colour, very soluble in the water. This solution, treated with acids, produces a very fine dichroic liquor, violet and transparent by transmission and carmine red and turbid by refraction. Eserine has the property of contracting energetically the pupil of the eye.

A kilogram of Calabar beans yields on the average one gram of eserine.

NEUTRAL HYDROBROMATE OF ESERINE (*Bromhydrate neutre d'ésérine*).

This body is prepared with colourless hydrobromic acid in the same manner as the sulphate. The solution, evaporated to a syrupy consistence, crystallizes in the course of a few days in fibrous masses, rarely colourless and non-deliquescent.

The neutral hydrobromate of eserine is employed like the sulphate and in the same doses, although it contains a little less eserine.

NEUTRAL SULPHATE OF ESERINE (*Sulphate neutre d'ésérine*).

This salt is obtained by saturating directly and exactly a known quantity of eserine with dilute sulphuric acid (1 in 10); or better still, by shaking a solution of the eserine with a titrated solution of sulphuric acid, so as not to exceed the point of saturation. The filtered solution of sulphate of eserine is evaporated rapidly to dryness by the aid of a gentle heat.

Sulphate of eserine can be crystallized in long prismatic needles combined in radiating groups, but it is very difficult. It is preferable to preserve it in the amorphous state and in well stoppered bottles, as it is very deliquescent.

Sulphate of eserine is employed, like eserine, internally under the form of granules containing up to 1 milligram. It is employed also for the eyes as a solution containing 2 to 5 centigrams of the salt to 10 grams of distilled water.

Solutions containing eserine, pure or combined, alter rapidly in contact with the air, becoming red; they should only be prepared in small quantities as required.

GLYCERATE OF CALABAR BEAN.

This is prepared by dissolving, with the aid of a gentle heat, the alcoholic extract of Calabar beans in glycerine, which should dissolve it entirely.

(*To be continued*).

A NEW METHOD FOR THE QUANTITATIVE DETERMINATION OF SUGAR IN BLOOD.

BY F. W. PAVY, F.R.S.

Dr. Pavy read a paper on Thursday, the 14th June before the Royal Society, in which he described minutely his new method for the quantitative determination of glucose, and its application to physiological relations of sugar in the animal system. Dr. Pavy claims that the accurate results which he has succeeded in obtaining by means of his new gravimetric process of analysis are such as will tend to advance materially our knowledge, and hence will substantiate and extend the position with regard to the treatment and pathology of diabetes.

The paper consisted chiefly of a description of the method which the author adopted for accurately ascertaining the amount of sugar in the blood of animals, and formed the prelude to a second one which was read on Thursday the 21st June, in which Dr. Pavy gave the results obtained by the application of his method as follows:—

1. The natural state of the blood.
2. The comparative state of arterial and venous blood.
3. The spontaneous change ensuing in blood after its removal form the system.

Before describing his own gravimetric system Dr. Pavy proceeded to criticize Bernard's new volumetric process, which has been described fully in recent issues of the *Comptes Rendus*. This method the author considers to be not only devoid of precision as a quantitative analytical process, but in itself calculated to give rise to fallacious results, inasmuch as keeping the suboxide of copper dissolved by means of organic matter is fundamentally wrong. The entire system was based on errors, and the results were necessarily incorrect; two of these errors the author dealt with somewhat in detail. The first was in the assumption that the volume of trial liquid corresponds in c.c. with four-fifths of their weight in grams of the mixture of sulphate of soda and blood. In practice it was found that the actual relation between the volume of liquid obtained and the weight of the mixture employed must vary in each individual case, according to the solid matter existing in the particular specimen of blood and the loss of liquid by evaporation during the separation of the coagulum by heat. The other error in Bernard's method arose from the influence which organic matter exerted in preventing the deposition of suboxide. The large addition of potash which is employed in this process, viz., from 20 to 25 cubic centimetres of a concentrated solution to one c.c. of the copper test, acts upon some one or other of the organic principles left in the liquid obtained from the blood, and prevents the deposition of suboxide of copper.

The author then proceeded to describe his own new gravimetric process, in which he adopts the use of a galvanic battery for effecting the deposition of copper which has been reduced by the sugar in a form to be susceptible of weighing. The details of this method are, shortly, as follows:—

A certain volume of blood—about 20 c.c. forms a convenient qnantity—is taken for analysis, and first mixed with 40 grams of sulphate of soda; the whole must be subjected to weighing in detail, so that the precise weight of the blood taken may be known. To this mixture, in a beaker of about 200 c.c. capacity, about 30 c.c. of hot concentrated solution of sulphate of soda are added, and the whole contents heated until a coagulum is formed.

Filtration is then performed, and the coagulum thoroughly washed, so that all traces of sugar may be removed. The liquid thus obtained, from having been run and squeezed through muslin, is slightly turbid, and must be boiled again and filtered through paper to render it perfectly clear. It is now ready for the application of the copper test. Being brought to a state of ebullition about 10 c.c. of the potassio-tartrate of copper solution, or sufficient to secure that the test liquid is left in excess, are added, and brisk boiling continued for a minute, but not longer. In this way a reduction of the oxide to the suboxide of copper is effected by the action of the sugar present in the solution.

The liquid is then filtered through a plug of asbestos, or, what is better, glass wool. The suboxide having been collected and washed from excess of the copper test liquid is next dissolved by a few drops of nitric acid, a small quantity of peroxide of hydrogen having been previously added in order to effect oxidation and consequent ready solution.

The copper present in the liquid is now deposited by the agency of galvanism. The positive pole of the battery is formed by a platinum spiral coil around which and forming the negative pole is a cylinder of platinum foil; upon this the copper is slowly deposited in a pure metallic form. This operation is continued until the appropriate test shows that the whole of the copper has been thrown down. The period ordinarily required to effect this does not exceed twenty-four hours.

The platinum cylinder is next removed, and instantly plunged first into distilled water, and then into alcohol. After drying in a water oven it is ready for weighing; the difference in the weight of the cylinder before and after the operation gives the amount of copper deposited.

The battery used is a modification of Fuller's Mercury Bichromate Battery, and has been selected on account of the constancy of its action.

From the amount of copper deposited, that of the sugar existing in the blood analysed may be accurately calculated. Five atoms of the cupric oxide of the test solution are reduced by 1 atom of glucose, it follows that 317 parts of copper represent the equivalent of one part of glucose, or the relation stands as 1 of copper to 0·5678 of glucose. Therefore to ascertain the amount of sugar the weight of the copper has to be multiplied by 0·5678. This application of the copper test solution yields a gravimetric instead of a volumetric process of analysis, and one which has no uncertainty belonging to it. There is nothing for the mind to decide, and no opportunity for error of judgment, as may be the case to a slight extent where a gradual fading of colour—as in the volumetric process—has to be watched until the attainment of the proper point of the decoloration has been effected.

The accuracy and reliability of the foregoing process are strongly supported by the uniformity in the results obtained from a large number of experiments. Compared with the results yielded by this gravimetric process, those obtained by Bernard present the greatest discordancy. The figures he gives are invariably too high, and there is no intelligible relation in the differences noticeable, suggesting that there is something radically wrong in taking decoloration without precipitation of suboxide as a means of estimating the amount of sugar. Dr. Pavy supports this assertion by the conclusions derived from a large number of experiments.

In his second communication, Dr. Pavy dealt with the question of the quantity of sugar in the system under the following conditions:—

1. The amount which exists in blood in its normal condition.

2. The comparative state of arterial and venous blood.

3. The spontaneous change which takes place in blood after its removal from the system.

The author pointed out that the very rapid changes which take place in blood under altered conditions of the system render it essentially necessary that the greatest precaution should be observed in order to obtain blood in its natural condition. If taken during life the animal should be in a perfectly tranquil state. If after, it should be procured as instantaneously as possible after the death of the animal, so that no opportunity could be afforded for the blood to be affected by the *post-mortem* production of sugar in the liver.

The experiments now under notice were made on dogs, sheep, and bullocks' blood, and a series of six, in one case seven, examinations of each kind instituted, and two analyses made for every sample taken.

In quoting Dr. Pavy's figures we are giving the mean of the two separate analyses. It is necessary, however, to state that the extremes of each show but trifling variations, and these are rarely so great as to effect more than the second figure in decimals. The differences were so slight indeed that had the results been obtained by rival analysts no dispute could have arisen, as the variations were within the recognized range.

Dr. Pavy detailed the precautions which he adopted in order to secure blood from the various animals in its natural state. In the case of the dog the painless and instantaneous mode of destroying life by pithing was performed. The larger vessels in the chest were immediately freely incised and the blood collected and analysed before coagulation could take place.

With the sheep the blood was obtained from animals slaughtered in the ordinary way, viz., by division of the vessels of the neck; and the time which elapsed between collection and the commencement of the analysis was not more than a quarter of an hour.

The blood of bullocks was obtained from animals slaughtered by the Jewish method; this consists of a sudden severance of the soft structures of the neck down to the vertebral column. The incision yields arterial blood, and the time which elapsed between collection and the commencement of the analyses was one hour.

The mean results of seven examinations of dogs' blood showed the amount of sugar which it contained in parts per 1000, to be as follows:—0·751, 0·786, 0·700, 0·766, 0·786, 0·921, 0·803, respectively. This gives an average of 0·787 on the whole series.

The blood of sheep yielded 0·470, 0·490, 0·517, 0·559, 0·569, 0·526, respectively, or an average of 0·521 parts of sugar per 1000.

The bullocks' blood gave 0·703, 0·525, 0·492, 0·456, 0·499, 0·588, or an average of 0·543.

In each of these experiments every care was taken to secure the blood in such a manner that it was a reliable representation of its ordinary condition during life. Unless such precautions are taken the results obtained will be, in a physiological point of view, worthless and misleading.

This fact was strikingly illustrated by a comparison of results which Dr. Pavy obtained from four bullocks killed in the ordinary way, viz., by felling the animal with a poleaxe, and breaking up the spinal cord by means of a cane. In the first two of these observations the opening into the blood vessels was made as speedily as possible after the animal had been felled. In the next two Dr. Pavy had reason to believe that this necessary condition had not been complied with, and that some little time was allowed to elapse between the felling of the bullock and the opening of the vessels. The effect of this delay in the *post-mortem* production of sugar is shown by the following results:—

Blood of the first two bullocks (mean of two analyses) yielded 0·596, 0·688, parts of sugar per 1000, respectively. In the second two a mean of 1·053 and 1·094 parts of sugar per 1000 were given.

The conclusions to be drawn from this various experiments are, that the amount of sugar contained in the blood of sheep and bullocks is about ½ per 1000, or 1 in 2000, and in a dog about ¾ per 1000, or 1½ per 2000. The results of the whole series of observations show a remarkable uniformity and harmony in the amount of sugar contained in the blood of the respective animals.

In striking contrast to this uniformity and consistency of the results attained by Dr. Pavy are the figures given by Bernard, who states (in *Comptes Rendus*, June 19th, 1876, p. 1409) that the lowest limit of sugar in the blood is 1 per 1000, and that in the normal state the amount of sugar varies from 1 to 3 per 1000.

Comparative State of Venous and Arterial Blood.

The author next considered the comparative states of the arterial and venous blood. This part of the subject is one which possesses the greatest importance from a physiological point of view.

One of the effects of anæsthetics on animals is to occasion an abnormal amount of sugar in the blood. In order to attain accuracy, therefore, it is indispensable that blood should be taken at a time when the animal is not under such influence.

In the first observation made on the blood of a dog, life had been instantaneously destroyed by pithing, and collections were made immediately after from the jugular vein and crural artery. No time was allowed for the effect of *post-mortem* formation of sugar in the liver to influence the blood. The results obtained by this method were as follows: crural artery, ·799, ·791; *mean*, ·795. Jugular vein, ·793, ·791; *mean*, ·792. In order, however, to obtain evidence to which no exception could be taken, Dr. Pavy adopted another method of procedure, which he was enabled to do just prior to the meeting of the society from having a restriction previously imposed under the Vivisection Act removed. This enabled him to collect the blood under the natural conditions of life both from the carotid artery and the jugular vein. The animals operated upon were placed under an anæsthetic, during which time the vessels were exposed and a thread placed loose round each. After they had regained tranquillity, and the effect of the anæsthetic passed off, the vessels were drawn forward and openings made into them to allow of the simultaneous escape of blood. So quietly and painlessly was this operation of collection performed, that the animals themselves manifested no signs of consciousness of what was taking place. The analyses of the blood obtained in this manner were commenced before coagulation had time to occur, and the results were as follow: No. 1, carotid artery, ·806, ·817; *mean*, ·811. Jugular vein, ·808, ·788; *mean*, ·798. No. 2, carotid artery, ·854, ·873; *mean*, ·863. Jugular vein, ·863, ·896; *mean*, ·879.

From these figures it is clearly evident that no material difference exists in the amount of sugar contained in arterial and venous blood.

Compared with these results the figures given in *Comptes Rendus*, lxxxiii., 373, by Bernard, stand in direct opposition. His volumetric process tends to show that a disappearance of sugar takes place largely while the blood is passing from the arterial to the venous system. In the journal referred to he gives the results of five observations referring to the crural artery and vein, and three to the carotid and jugular.

The mean of these several observations shows an apparent difference between arterial and venous blood of ·300 parts of sugar per 1000. The least difference stands in an observation in which the figures are 1·100 parts per

1000 for arterial, and 1·080 for venous, showing a variation of ·020. The greatest difference is in an observation where the figures stand 1·510 for arterial and ·950 for venous. This comparison relates to the carotid artery and jugular vein, and the difference amounts to ·560 parts per 1000, which represents actually altogether a larger proportion of sugar than Dr. Pavy has found exists naturally in the blood of the sheep and the bullock.

Spontaneous Disappearance of Sugar from Blood.

Turning to the third part of his subject, viz., the spontaneous disappearance of sugar from blood after its removal from the system, Dr. Pavy gave the results of a series of analyses he had conducted, and which are as follows:—

No. 1.	Taken immediately after death	mean	·786
	„ after 1 hour	„	·739
No. 2.	Taken immediately after death	„	·700
	„ after 1 hour	„	·670
No. 3.	Taken immediately after death	„	·766
	„ after 1 hour	„	·751
	„ „ 23 hours	„	·285
No. 4.	Taken immediately after death	„	·786
	„ after 1 hour	„	·728
	„ „ 24 hours	„	·302
No. 5.	Taken immediately after death	„	·921
	„ after 1¾ hours	„	·793

A somewhat parallel series of experiments made by Bernard, and published in *Comptes Rendus*, June 19th, 1876, show a remarkable discrepancy with the foregoing. Bernard's figures show—

Amount of Glucose immediately after death	1·070
„ „ after 10 minutes	1·010
„ „ „ 30 „	0·880
„ „ „ 5 hours	·440
„ „ „ 24 „	0·000

Dr. Pavy pointed out that there was nothing new in the suggested discovery that a gradual destruction of sugar takes place with blood after its removal from the system. He himself had brought the fact before the notice of the Royal Society so far back as 1855, when he stated that under the changes of the decomposition of blood normal animal glucose is very readily metamorphosed. The rapidity of the metamorphosis depending on the activity of the decomposition of the animal substances present.

In conclusion the author stated that the evidence adduced in this communication shows that the results which Bernard has obtained by the experimental *modus operandi* he has been recently employing are erroneous and consequently the inferences he has drawn from them are equally in error. The cause of truth and the interests of science demand that what he has recently been advancing should be eliminated from physiological literature.

ACCLIMATIZATION EXPERIMENTS WITH MEDICINAL PLANTS.

The following extracts relating to articles of the materia medica are quoted from "The Annual Report on the Progress and Condition of the Royal Gardens, Kew, for the Year 1876, which has just been issued":—

"*Balsam of Copaiba.*—Some well ripened seeds of the Para copaiba (*Copaifera multijuga*) have been brought by Mr. Cross from the forests of Para, and germinated freely. The tree which produces it is described as gigantic, the trunk sometimes rising to a height of eighty feet before branching. The Para balsam, called *Copaiba blanca*, is chiefly sent to France, where it obtains the highest price of any. A single tree, if tapped at the right season, is said to yield about eighty-four imperial pints of balsam. Very little is known of the history or botanical characters of this plant, which has been only imperfectly described. It is greatly to be desired that this tree should be introduced into the East Indies."

"*Balsam of Peru.*—This beautiful tree (*Myroxylon Pereiræ*) was introduced into Ceylon in 1861 by the exertions of the late eminent pharmaceutist, Daniel Hanbury. It has succeeded there admirably, and last year I received several parcels of seeds from Dr. Thwaites, which I have distributed to various tropical colonies. Dr. Thwaites speaks in warm terms of the beauty of its foliage and habit."

"*Ipecacuanha.*—Dr. King reports that he fears this drug cannot be grown profitably so far north in India as Bengal; but that the secret of its successful propagation being now perfectly understood any quantity of seeds can be sent out. A quantity of the dried root has been prepared by Dr. King for use in the Medical College Hospital of Calcutta, and found to be quite as efficient as the best South American drug. The disadvantage attributable to the extreme slowness of the growth of this plant, and hence small annual return of root wherever it has been cultivated, must be met by a greater extension of the cultivation, as to which there should be no difficulty, seeing that the plant is increased with astonishing facility by ordinary cuttings, root division, or by merely pegging a leaf to the earth."

"*Castor Oil in Bahamas.*—A correspondence has taken place with the Colonial Office on the subject of the cultivation of the castor oil plant in the Bahamas. Governor Robinson states that 'the castor oil plant grows here as a weed, but no endeavour yet has ever been made to express the oil. Thousands of gallons might be exported from here annually.' A supply of the best castor oil seed was obtained from Calcutta and forwarded to the Bahamas. Governor Robinson now reports: 'The yield of this variety of the castor oil plant is, we should say, fully three times greater than that commonly found amongst us, the heads and the beans themselves being very much larger than those produced by the native variety. As the East India Plant can be cultivated quite as easily and readily as our own, and as it possesses such a marked superiority in the matter of yield, we hope to see it speedily and widely introduced into the colony, so as to supersede the indigenous kind altogether.'"

"*Burmese Cardamoms.*—A sample of these seeds was sent to Kew by the India Office for identification. Burmese cardamoms fetch a low price in the market compared with Malabar cardamoms, and it was supposed that this might be due to the intermixture of the seeds of this plant with those of a spurious kind. It was, however, quite certain from their microscopic structure that the seeds sent were not those of *Elettaria Cardamomum*, and it was not improbable that they might belong to *Amomum xanthioides*, the wild cardomom of Siam, but about which scarcely anything is known. In this, as in so many other cases, the materials sent to Kew for an opinion were from a botanical point of view lamentably insufficient, and this was in this particular instance the more to be regretted, because a scientific department like the Indian Forest Service might easily obtain such a series of specimens for transmission to England as would enable the whole history of the Burmese cardamom, which at present is very unsatisfactorily known, to be entirely cleared up."

With regard to the *Cinchona Cultivation in St. Helena*, Sir Joseph Hooker says,—"In my report for 1874, I pointed out that 'the suitability of the soil and climate of that island for cinchona cultivation has now been indisputably proved.' It is a melancholy conclusion to the efforts made by Kew on behalf of this doubtless dispirited, but I am afraid I must add, spiritless colony, that nothing has been done to utilize so easy a source of revenue. In a private letter recently received, I am informed, 'up to within a few months since a man was paid by the colony to look after the cinchona plants on Diana's Peak, but even he has been disestablished, and the plants are overgrown and almost hidden in ferns and dense undergrowth of native vegetation.'"

The report, which deals largely with other plants of economic value, will be found of more than usual interest.

The Pharmaceutical Journal.

SATURDAY, JULY 14, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

EXTRA-JUDICIAL SENTENCES.

THE trial of a pot-boy at the Quarter Sessions held at Margate last week, for the offence of attempting to commit suicide by poisoning himself with laudanum, has furnished the opportunity for another extra-judicial utterance, similar to those which have on several previous occasions given rise to comment in these columns. A chemist's assistant, who had complied with all the legal requirements in the sale of two-pennyworth of laudanum, was admonished by the Recorder in such a manner as to suggest that had the would-be suicide succeeded in carrying out his intention, the chemist's assistant would in some way have been held legally responsible for his death.

It is far from our intention to suggest that there is no moral responsibility lying upon the registered chemist and druggist beyond an exact compliance with the provisions of the Pharmacy Act in the retailing of poisons to the public. The very position assigned to him under that Act implies that he shall be a person who will exercise his important trust with an intelligent regard to the safety of the public. At the same time it must not be forgotten that Parliament has, wisely or unwisely, made important distinctions as to the manner in which different poisonous substances are to be supplied to the public, and it may be presumed that the reason for not imposing the same restrictions upon the sale of articles included in Part 2 of the schedule as upon the sale of those in Part 1 was that these restrictions were not thought necessary. It may therefore be fairly disputed that the chemist and druggist is called upon to impose restrictions upon the sale of poisons not found in the statute, or to do more than to exercise ordinary care towards preventing, so far as he is able, poisons from coming into the possession of improper persons. Whether such carefulness was so wanting in the case in question as to justify the Recorder's remarks is, in our opinion, at least open to question.

The facts of the case, as they have reached us, will be found in the report quoted from a local paper on p. 37, and the letter from a correspondent on p. 39. A lad, described in the indictment as fifteen years of age—our correspondent says that he is now sixteen in age and appearance—asked to be supplied with twopennyworth of laudanum for his master, professing ignorance as to the purpose for which it was required. Applicant's master being known as a neighbour, and he himself proving cognizant of the fact that laudanum is a poison, the drug was supplied, bearing a red label with the words "Laudanum, Poison," and the seller's name and address. Some time afterwards the lad attempted to poison himself with laudanum, but this incident has no bearing on the point under discussion, as it does not affect the conduct of the person who sold the poison. The law, however, having been thus complied with by him, the question arises whether there were any circumstances that should have suggested extra precautions beyond those that were taken.

Of course the age of the person to whom the poison was supplied would have an important influence in the decision of this question, and the learned judge appears to have rather persistently associated the designation "child" with the prisoner. But although this may have been correct in point of law, it is hardly the name that would be applied popularly to a fairly grown lad of sixteen. Seen in the light of the subsequent occurrence it may appear that to have required some guarantee of the truth of the lad's story would have been an advisable course, but practically this could have only been done with certainty by interviewing his master—a course that was hardly called for. As to the suggestion of the Recorder that the laudanum should not have been delivered without a medical certificate, this is palpably absurd. On the whole, speaking after the event, and assuming the correctness of the information that has reached us, we think that very little censure, if any, can be fairly cast upon the person who sold the laudanum in this case.

In conclusion, we would again carefully guard ourselves from being supposed to assert that the chemist and druggist has no other responsibility than the use of a proper label in the sale of even so common a narcotic as laudanum. But this view does not bear pushing too far, and it would indeed be anomalous if chemists and druggists were bound to exercise such extreme precautions while selling two drachms of laudanum under its proper name, with the caution that it is a poison, whilst co-operative stores and hucksters are allowed to sell it by the quart, under cover of a *nom de plume* and a government stamp, without any precautions whatever.

THE ALLEGED BREACH OF THE APOTHECARIES ACT AT BIRMINGHAM.

WE are enabled by the courtesy of the executive of the Chemists and Druggists' Trade Association, who are defending the case, to lay before our readers a much fuller report of the proceedings in relation to the alleged breach of the Apothecaries Act at Birmingham than that printed in the last number.

The importance of the subject to most of our readers will, it is believed, excuse a partial repetition, although we regret that the necessity was not prevented by a little more promptitude in supplying the report.

BRITISH PHARMACEUTICAL CONFERENCE.

The following are the titles of papers already announced to the Secretaries for reading at the approaching meeting at Plymouth on Tuesday and Wednesday, the 14th and 15th of August.

1. The Supply of Cinchona Bark as Connected with the Price of Quinine. John Eliot Howard, F.R.S.
2. Report of the Committee on the Extraction and Investigation of the Aconitines of *Aconitum Napellus*. Dr. Wright, F.C.S., J. Williams, F.C.S., and T. B. Groves, F.C.S.
3. Report on the Active Principle of Capsicum Fruit. J. C. Thresh, F.C.S.
4. The Fats in Capsicum Fruit. J. C. Thresh, F.C.S.
5. Report of Continued Researches on Essential Oils. Dr. Tilden, F.C.S.
6. On a Product of the Oxidation of Barbaloin and Socaloin. Dr. Tilden, F.C.S.
7. Report on the Proximate Constituents of Ivy Berries. R. H. Davies, F.C.S.
8. Report of a Research (part 2) on Essential Oil of Sage. M. M. P. Muir, F.C.S., and Mr. Siguira.
9. An Impurity in Oxide of Zinc. W. W. Stoddart, F.C.S.
10. An Improved Preparation of Ergot. Mr. A. W. Postans.
11. The Microscope in Pharmacy. Mr. J. Cooke.
12. Additional Notes on the Assay of Opium.
13. Tincture of Acetate of Iron. Dr. C. R. C. Tichborne, F.C.S.
14. Sugar in Pharmacy. Dr. C. Symes.
15. A Point in Pharmaceutical Ethics. Mr. S. R. Atkins.
16. A Paper on Brucia will probably be read by W. A. Shenstone, F.C.S.

The Secretaries state that eight or ten other papers are expected.

WHAT DOES IT MEAN?

Our American contemporary, *New Remedies*, states that a number of Brooklyn physicians and pharmacists have connected their "offices" by means of a telegraph. This proceeding seems to have aroused suspicion of an intention to unduly influence business, as for instance when a person applied in an urgent case to a druggist for the address of a physician he would be able to ascertain which of the "ring doctors" might be at home. One explanation, however, is that the arrangement had its origin in a chess club, and was undertaken to enable the members to follow the game without being absent from their places of business!

THE SOCIETY OF ARTS MEDALS.

The Albert Medal of the Society of Arts, for distinguished merit in promoting Arts, Manufactures, or Commerce, has been awarded this year to M. Jean Baptiste Dumas, the distinguished chemist, who presided over the *commission de rédaction* of the French Codex in 1862. One of the Medals for papers read during the session has been awarded to Professor Barff for his paper on the treatment of iron for the prevention of corrosion, which was reprinted at the time in this Journal.

Parliamentary and Law Proceedings.

Apothecaries' Co. *v.* Harrison.

This case was heard at the Birmingham County Court, before Mr. James Motteram, Q.C., judge, on Monday and Tuesday, July the 2nd and 3rd. The plaintiffs were the Society of Apothecaries, London, and the defendant James Harrison, chemist and druggist, of 73, Stafford Street, Birmingham.

Mr. Nathan (instructed by Mr. W. J. Reeves) appeared in support of the case, and Mr. Jesse Herbert (instructed by Mr. Glaisyer) defended on behalf of the Chemists and Druggists' Trade Association.

In opening the case Mr. Nathan explained that the action was brought under the 20th section of the 194th Chapter, George III., entitled, "An Act for better regulating the practice of Apothecaries throughout England and Wales." The section provided "That if any person (except such as are then actually practising as such) shall after the said first day of August, 1815, act or practice as an Apothecary in any part of England or Wales without having obtained such certificate as aforesaid every person so offending shall for every such offence forfeit and pay the sum of twenty pounds." The action was now brought to recover the penalty named. He said it might be possible, if the Apothecaries' Company strained their powers, to bring an action against a chemist every time he gave a man over the counter a cooling draught or suggested a pill for stomach-ache. But if the respectable body he represented were to be guilty of such folly public opinion would step in. These actions were always a matter of great consideration, involving many inquiries and much correspondence before the company would allow their name to be used in any way whatever in connection with the same. Any person who had a knowledge of the facts connected with the previous actions could not help admitting that the discretion of the Society had been well exercised. It was perfectly clear that if a man practised as an apothecary he was liable to the penalty, the "practising" being professing to be a judge of internal complaints by external symptoms, and applying himself to their cure by medicine. If that was established in the present case it would be sufficient for the penalty. After detailing the evidence he purposed adducing, the learned Counsel called

Julia Caddick, who, having been sworn, returned the following answers to the following questions:—

Do you know Stafford Street, Birmingham?—Yes.

You know Mr. Harrison?—Yes, sir.

Did you go to his shop last November?—Yes, the 27th.

What did you tell him?—I asked if he could make me up something for a weakness left on me.

His Honour: What did he say?—He asked me what the weakness was from.

His Honour: Well?—And I told him.

His Honour:—What did you state?—I said it was weakness left on me from my confinement.

His Honour: Did he do anything; did he feel your pulse or look at your tongue?—Yes, sir.

His Honour: What did he do?—He looked at me.

His Honour: Will you be good enough to tell me all he said and did?

Mr. Nathan: Did you explain?—I told him, sir, and he gave me medicine.

What did you tell him?—I told him the womb came down.

Came down; did you describe anything else to him? did you tell him what you felt?—Yes.

His Honour: Did he inquire?—Yes, I said I was very weak, and he said the medicine would do me good.

His Honour: Will you begin from the time you went into the shop and tell me all you said, and what he said and what he did with reference to this matter?—I went to Mr. Harrison and asked him if he could give me something for a weakness, and he said, "what weakness?" and I explained, and he gave me a bottle of medicine.

His Honour: Did he examine you?—No.

His Honour: Did he feel your pulse?—Yes, I think he did.

His Honour: I don't mean a particular examination; did he look at your tongue or feel your pulse?—Yes, sir, he did feel my pulse.

Mr. Nathan: Did he look at your tongue?—No.

Did he ask you anything about how you felt or what you felt?—Yes, I told him I suffered very much from my back.

His Honour: "From my back?"—Yes; and he gave me the medicine and said he thought it might do me good.

His Honour: Did he say he knew what it was?—He said the medicine would do me good and I was to take it by the instructions on the bottle.

Mr. Nathan: Did you take some of it?—Yes, sir.

Did you pay him?—Yes; a shilling.

Afterwards, in April last, when the summons was served, did he come to see you?—Yes, sir.

Did he ask you to let him look at the bottle?—Yes; he came on the 7th of April, and asked to look at the bottle. He said, "Is your name Goodwin?"

His Honour: Never mind about that.—He said, did I remember going to Adcock's for a bottle of medicine, and I said no; then he said it was a very bad case for him to be fined £20 for selling a bottle of medicine.

His Honour: I said I did not remember going to "Adcock's."—No; not for a minute I did not remember where I had been.

Mr. Nathan: Was he the same man you saw at the shop?—Yes, Mr. Harrison; he looked on the table at the baby's bottle, and asked for the bottle, and I said I didn't know where it was.

Did he ask about the medicine and whether it had done you any good?—I said I had taken some of it.

Did he ask whether it had done you any good?—Yes; I told him I had taken some and that I did not know whether it had done me any good, and that I had taken enough of it. I knew I must take more than a bottle.

His Honour: Is that what you said?—Yes; and he came again on the 9th.

Mr. Nathan: What was that for?—He said that he had mentioned his case to a gentleman friend who would not believe him till he opened the case to him, and he wished to see me.

You would not go?—No; I said I would not on account of the baby's sickness.

Did he come again?—Yes; on the 16th of April and brought a cloak and wanted to fetch a cab to take me to his solicitor, but I would not go.

His Honour: Wanted to fetch a cab and take you to his solicitor?—Yes, but I would not go; I said all I could say was that I had the medicine.

His Honour: I told him it was no use my going, as I could only say I had the medicine. He asked me whether it was him or his assistant, and I said of course it was you, Mr. Harrison, who served me.

Mr. Nathan: You were very unwell I believe when you went there?—Yes sir.

Besides what you have said were you very pale and weak?—Yes; he asked me if I had mentioned it to Mr. Jones, and I said I had not.

Had you any conversation with him when you first went to him about what you were suffering from—what you felt?—No more than I told you.

Mr. Herbert (cross examining): You remember these circumstances though they occurred last November?—Yes.

All that took place when he came to your house?—Yes.

Did you say you could not go because you had not the clothes?—Well I had not the clothes, but I said the sickness of the baby.

Then why did he bring a cloak the second time?—I know I said I could not go then.

Did you say you could not go because you had not clothes to go in?—I said I could not go then.

Did you say you did not know the name of the shop you went to?—No; at the first time I did not remember the shop, but I told him the second time; I did not know him for a minute when he first came in, but I knew him after.

But did you tell him that you did not know which shop it was?—No; I said it was a little shop below Adcock's.

You did not say it was "Adcock's"?—No, because I knew it was not.

Where do you live?—In Allison Street.

How far is that from Stafford Street?—Not far.

Half an hour's walk?—No, it would not take me that long.

Had you been to Harrison's shop before?—Not for myself, I had not.

Have you been there at all?—I have been before, I know.

What made you go that day?—Because I was told he might do me good.

Who told you?—Mr. Goodwin.

Who is Mr. Goodwin?—The master of the house I live in.

Did you know why he wanted the bottle?—I did not.

Do you know whether he is going to give evidence?

Mr. Nathan: She does not know, I know.

Mr. Herbert: Why did you go to Mr. Harrison?—I would go anywhere I thought would do me good.

Was it not his assistant you saw?—No, I saw Mr. Harrison himself.

Did you not tell Mr. Harrison it was his assistant you saw?—No, I did not.

Did not you say you did not know which it was?—I said it was you, Mr. Harrison.

Oh, you knew Mr. Harrison when he first came in?—No, not for the minute, but I did when he sat down.

Did you not tell him you had never seen him before?—He said he did not remember serving me, and I said yes, it was you, Mr. Harrison.

How long were you in the shop with him?—I know I was not there long.

Were you there three minutes?—Of course I was.

Were you there five?—I dare say I was there quite that long.

When was the first time you saw Harrison?—The 27th November was the first time I could remember seeing him.

Where was the bottle when he came the second time, and you said you had given it to Mr. Goodwin?—I had given it to Mr. Goodwin.

Then you were sent by Mr. Goodwin to get it?—I was told it might do me good.

How was it you did not drink it all? After you had drunk a certain portion you gave it Mr. Goodwin?—Yes.

You said, you said you had not taken enough to do you good, because you knew you must take more than a bottle?—I did not take any more because it seemed to get me in pain.

Were you not sent for it on purpose to hand it over to Mr. Goodwin?—No, I went because I wanted it to do me good.

How old was the baby then?—Between two and three months.

Did he write you any prescription?—No, he made it up himself.

His Honour: I wish you would let me hear?—I said he did not write me any prescription.

I suppose he casually felt your pulse and said "very slow" or "fast"?—He said he could make me a mixture that would do me good.

His Honour: Felt your pulse and said he could make a medicine that would do you good?—Yes, sir.

Did you say your womb had come down?—Yes.

Charles Radford Suffield, M.D. and F.R.C.S., upon being sworn, was examined by Mr. Nathan as follows:—

Were you present in Court when the last witness was examined?—Yes, sir.

And you have heard her give her evidence?—Yes.

From the description she has given of what she suffered and what she told Mr. Harrison at the time what she was suffering from?—I should imagine that she was suffering from a disease called anæmia, deficiency of blood or of the red particles of blood.

Is it an internal complaint—constitutional?—Yes.

And a dangerous one?—Yes, unless treated properly.

I believe it may arise from a great number of causes?—Yes.

And common to both sexes?—Yes.

His Honour: Not so common to man as to woman?—No.

Is it in your opinion a constitutional complaint?—Yes.

In diagnosing a complaint of that nature would such an account as you have heard from the woman have been sufficient?—No, we might go a little deeper into particulars. A good deal would depend upon complexion, pulse, etc.

The appearance of the pulse is one of the symptoms from which you diagnose?—Yes.

Do you ever form a diagnosis from it alone?—No.

You don't consider it sufficient?—No.

Mr. Herbert: You would not consider it sufficient?—No.

Mr. Herbert: In the early stages it is not very dangerous, is it?—No.

Have you examined that mixture?—No. I have looked at it, and I imagine it is a preparation of iron which would be a proper medicine.

I believe this disease is not a common one?—No, by no means; it is a disease of poverty, if you like.

Is it a very common disease?—No, not a very common disease.

But I believe thousands have suffered from it?—Yes, the world is very large.

His Honour: And it has existed a long time.

Mr. Herbert: It is not an uncommon disease?—Certainly not.

Mr. Nathan remarked that the above was the evidence for the plaintiffs.

Mr. Herbert submitted that the case had not been proved. He contended that according to the Act, any person practising as an apothecary before 1815 may so practise now. It was for the prosecution to prove that the defendant was not in the business at the time the Act was passed.

His Honour: What do you say to that, Mr. Nathan.

Mr. Nathan: I say it lies on the defendant to prove that he was. It is impossible to prove a universal negative. The affirmative lies on him who affirms.

His Honour: You affirm as a fact that he was not an apothecary before 1815. You allege that he was not an apothecary before 1815.

Mr. Nathan: Then I say the onus does not lie on me; it is a negative, and no man is bound to prove a negative.

His Honour: I find the case has been tried twice in your favour, Mr. Nathan, and against you, Mr. Herbert. It would be for you, Mr. Herbert, to prove that he was practising previous to 1815. Feeling sure that no injustice will be done to the defendant, I shall hold that inasmuch as the affirmative is with you, Mr. Herbert, and within your own knowledge, that it is for you to establish and not for Mr. Nathan to prove a negative. If there is the slightest doubt about it I will adjourn the case until to-morrow morning. It is a matter which may be proved by subpœnaing the witness.

Mr. Herbert: In order that the case may go on I will admit as a fact that the defendant was not in practice prior to 1815.

Mr. Herbert: I am instructed by Mr. Glaisyer, the Solicitor of the Chemists and Druggists' Trade Association, to appear on behalf of the defendant. The defence is a very simple one, and it would be necessary that I should argue at some length. There have been many actions brought against unqualified men, but not against qualified chemists and druggists. The real question is whether chemists and druggists may recommend their wares over their counter to persons coming to buy. The point is a new one, and knowing that a case has gone up to the Court of Exchequer, knowing that it was a question whether properly qualified chemists and druggists could really recommend their drugs and medicines, and in the face of a special request for delay until the case had been decided, the Apothecaries' Company have pushed forward this action and for the penalty, when no possible good can result from it. The action cannot possibly serve any purpose, because, if your Honour is against me, it will be necessary to appeal to a higher Court to have the point decided, as in the previous case. After quoting various sections of the Act, the learned counsel submitted that chemists were legally entitled to conduct their business in the manner adopted prior to 1815, and that as he should prove by a witness who had been in the trade since 1809—six years before the passing of the Act—that such a procedure as that alleged to have been taken by the defendant for the recommending of drugs or medicines upon an expression of certain symptoms was the custom before 1815. But now, after a lapse of sixty years, there was a sudden outburst of feeling, it being probably thought by the Company that all witnesses who could prove the custom prior to 1815 had become decrepit or died out. The 28th section provided "That nothing in this Act shall extend or be construed to extend to prejudice or in any way to affect the trade or business of a chemist and druggist in the buying, preparing, compounding, dispensing and vending drugs, medicines and medicinable compounds, wholesale and retail." It was, therefore, perfectly clear that chemists properly qualified might furnish and supply medicine, and, he submitted, there was no evidence to show that the defendant had either attended or advised in the present case.

His Honour: Do you mean to say any person may go to a chemist and say, "I am suffering from some disease or other, but I don't know what it is; I have not been well for a month and am getting worse," and the chemist prescribe for him?

Mr. Herbert: In simple minor ailments.

His Honour: You admit no chemist can attend at a patient's house and supply medicine?

Mr. Herbert: Yes.

His Honour: But you say he may prescribe?

Mr. Herbert: I don't like the word prescribe.

His Honour said in his opinion a man might go to a chemist and say, "I have got a toothache, or I have got a headache, will you give me, say, some sal volatile for the headache and some tincture for the tooth." His Honour had not the slightest doubt that a chemist might sell what was required, but whether he might take the ordinary means of finding out the headache or toothache and then prescribe medicines for the disease which he himself had found out, was quite another matter. He ventured to put it that if a man went to a chemist's shop and said he was suffering from some disease, the nature of which he did not know, and the chemist took the ordinary means of feeling his pulse and examining him, and then saying, "I know what's the matter with you," and supplied him with some medicine, he would be infringing the Act.

Mr. Herbert: I might consult with one of my friends and say, "I think a little quinine would do you good; go to Southall Brothers and get it there." If I may say that, why may not a chemist say it?

His Honour: You have no interest in the sale of the quinine. You may as a friend offer advice, but gratuitous advice is seldom worth receiving. It was lest a man not being qualified should give a wrong medicine that the Act was passed.

Mr. Herbert: But defendant is qualified, and the Act was never intended to apply to properly qualified chemists and druggists. The woman goes to the defendant, says, "I am weak; my womb is down owing to weakness left in my confinement," and Dr. Suffield says the medicine given by the defendant is the right stuff.

His Honour: Dr. Suffield said it was probably a preparation of iron, and if so it would be a proper medicine. Did Mr. Herbert think that supposing his client was properly qualified that such a man would have prescribed medicine which might have had serious effects without inquiries as to the particular state of that woman, when she herself said she was suffering from weakness. In my opinion there is no difficulty in the law, but in applying it. If there is "prescribing" the chemist infringes the Act, but if there is no "prescribing" he does not do so. If he sells his medicine simply because he is asked for the same I think there is no infringement.

Mr. Herbert: He writes no prescription, and simply on the statement of the woman, he makes a medicine and gives it her. A simple charge of one shilling was paid for the medicine, the same amount as would have been required had the woman sent for the bottle instead of going for it herself. If the Act touched Mr. Harrison it should touch Mr. Goodwin, for on his advice the woman fetched the medicine.

His Honour: If you can put Mr. Goodwin on a level with the chemists and druggists, for the Act says they shall not prescribe.

Mr. Herbert proceeded to argue that defendant had acted in accordance with the custom prior to the passing of the Act, as the learned counsel contended he had a perfect right to do. Not allowing chemists and druggists to give advice would prevent the poor scarcely ever getting advice.

James Harrison, the defendant, examined by Mr. Herbert, replied as follows:—

Are you a registered chemist and druggist?—I am.

Do you carry on business in Stafford Street, as a chemist and druggist?—I do.

Will you look at that register of chemists and druggists?—I have not my glasses.

Your name appears in it, does it not?—Yes, sir.

How long have you been a chemist and druggist?—Thirty years.

During that time have you ever been charged for precribing?

Mr. Nathan: That is not fair.

Do you remember Julia Caddick visiting your shop stNovember?—Yes, sir.

I believe it was in the afternoon?—Yes, it was.

What then took place?—She came to me and asked for a bottle of strengthening medicine, which I supplied her for a weakness.

Did you examine her at all?—No, it was not necessary.

Did you feel her pulse?—Certainly not.

Did she say anything about her womb?—No, nothing whatever.

Have you told us all the conversation that took place between you?—She asked me for a bottle of medicine for a weakness, and I said "Is it in connection with your lying-in, you mean?" and she said. "No." Seeing that she had been recently confined I asked her that.

His Honour: You asked her if the weakness had anything to do with her confinement?—Yes, sir.

His Honour: Do you say she had been recently confined?—She had a baby in her arms, which was a proof of it. I asked her if it was hers, and she said "Yes." I said, "What kind of weakness is it?" and she said, "I mean weakness of the body."

His Honour: That does not come in very well.—Yes; she said, "I mean, weakness of the body."

Mr. Herbert: What did you say in reply to that?—I said, "Do you mean general weakness of your constitution?" and she said "Yes."

What was done then?—I then mixed up some stuff.

Will you look at that; is that the stuff?—No; I never sold such rubbish out of my shop. I never sold such rubbish in my life.

What kind of weakness was she suffering from?—You might call it anæmia.

Mr. Nathan: How did you know which kind of medicine to supply her with—did you take it at random?—I supplied it in the ordinary way that chemists and druggists do.

You saw the woman and judged that she was suffering from debility and anæmia?—Yes.

How did you know which of the tonics to prescribe?—From instinct.

Mr. Nathan: What did you give her?—To the best of my belief, tincture of iron with quinine.

When you were served with the summons you went to see Mrs. Caddick?—I did.

Did you ask whether she recollected fetching a bottle of medicine from Mr. Adcock's?—No, I did not.

You went to the woman when you were served with the summons?—Yes; I said to her "Do you know me?" and she said, "No;" and I said, "Did you ever go to a chemist and druggist for any medicine?" and she said, "Yes;" and I said, "Where did you go to?" and she said, "I went to a shop in Stafford Street." Then I said, "If you went to a shop in Stafford Street and it was not me, was it Adcock's?" and she said, "Yes, it was;" and I wrote it down.

Did you say I don't recollect serving you?—No.

You did recollect her perfectly, did you?—Yes, I did.

Did you ask her whether she was sure it was you or your assistant.—Yes, I did.

And you did not feel her pulse?—No.

Why did you go to the woman?—I went to her and wanted her to go to a solicitor's office, and say what she thought proper. I wanted her to state what she said to me.

In selecting this medicine you selected it by instinct?—Well, I gave it her from many others.

Mr. Herbert: You gave a common remedy?—Yes.

His Honour: She did not tell you she was suffering from anæmia?—She told me she was suffering from weakness, and I gave her some medicine, but not that rubbish.

Thomas Parsons stated that he was eighty-four years of age, served his apprenticeship to a firm of chemists and druggists, and had remained in the trade till about twelve or fourteen years ago.

Mr. Herbert: If a person, prior to 1815, came to the shop and described her symptoms, did you give her medicine for the complaint?—I was accustomed to give medicine as well as advice.

Did you give advice?—Yes; in an important or serious case the head assistant or one of the principals attended to it.

In simple cases you prescribed?—Occasionally.

And in more difficult cases one of the principals?—Yes.

Was that the custom of the trade at that time?—Yes.

Do you know whether it was done in other shops?—It was.

His Honour remarked that according to defendant's own admission, he took the woman's word for what was the matter. If a chemist would take the simple word of a patient for what was the matter with her, and without making any examination, supply medicine, it was almost impossible to conceive how important it was that the Act should be properly observed. In the present case a chemist and druggist of thirty years' standing was simple taking the statement of his patient's case and without feeling her pulse, supplying medicine, as he said, by instinct.

At this stage the case was adjourned till Tuesday morning, when James Harrison, the defendant, was recalled by Mr. Herbert.

How much did you charge for the medicine?—For the medicine I supplied I charged one shilling.

One shilling?—Yes.

Did you charge anything for consultation?—No.

Was it or was it not the value of the medicine alone?

His Honour: No one says it was not.

Mr. Herbert: I want it to be particularly on your notes that nothing was charged for advice.

His Honour: The reverse is not on my notes, therefore I shall take it there was not. If you mean that one shilling was charged for the medicine, and nothing charged for advice, I have that fully; but whether the medicine which was sold was the consequence of the prescribing is quite another thing. There is no doubt at all he charges nothing in that sense; he does not say, so much for your visit to me, nor so much for the advice given you.

The witness being asked what was in the bottle, his Honour remarked that it was a pity the question had been raised. Defendant, he said, had denied on the previous day that the bottle of medicine produced was the one he supplied. He considered that a serious imputation upon the plaintiffs and one that ought to be withdrawn.

Mr. Herbert withdrew the alleged imputation and the witness proceeded to describe what the mixture supplied was composed of, evidence which His Honour held to be utterly irrelevant to the question at issue.

Julia Caddick, recalled, said in answer to Mr. Nathan, that in mixing the medicine defendant weighed something in the scale and poured something from a bottle.

The bottle given to you, you say you gave to Mr. Goodwin; did you take any of it?—I took some two draughts.

How long was it before you gave the bottle to Mr. Goodwin?—I took one draught the day I had it, and one the next day, and then gave it to him.

Did you put anything into it, or alter it in any way?—No, I did not.

Did Goodwin ask you for the bottle?—Yes.

And what did you say?—I told him it did not agree with me, and gave it to him.

His Honour: Who is Mr. Goodwin?

Mr. Nathan: I am going to call him.

William Henry Goodwin, examined by Mr. Nathan, returned the following answers to the following questions:

What are you?—A commercial porter.

In whose service?—Different gentlemen engage me.

Where do you live?—20, Allison Street.

Did Julia Caddick live with you in November last?—Yes, she did.

How long have you lived there?—Twelve years.

How long has Julia Caddick?—About three years.

You remember when she gave you the bottle of medicine?—I received the bottle on the 28th, which she brought on the 27th.

How long did you keep it in your possession?—One night, sir.

On the 28th did you take it to Mr. Reeves?—Yes, sir.

Did you put anything with it or alter it in any way?—No.

I suppose you had been told by Mr. Reeves to get it?—Instructed by Mr. Reeves.

Instructed to do what?—To procure the bottle.

His Honour: How did he know you had it?—I was engaged by Mr. Reeves to send for it.

And you sent Julia Caddick to Mr. Harrison's?—Yes.

Mr. Herbert: She being very weak?—Yes, and ill.

Three months after her child was born?—Yes.

Suffering after a confinement?—Yes.

You simply told her to go and get it, to say she was weak, and you to take it to Mr. Reeves?—I did not tell her that.

Is Julia Caddick living with you as your wife?—I expect to make her my wife.

And in that capacity you sent her for the medicine?—Yes, she not knowing what my intention was.

Then you are the informer in this?—I received instructions from Mr. Reeves to do it.

To get up the case?—To do what I did.

This was the whole of the evidence, and at the invitation of his Honour, Mr. Herbert again addressed the court.

The learned counsel contended that the defendant had in no way infringed the Act, and the statement of the woman. The chemist had a right to consult with his customer and supply what was best for her. Surely the defendant might suggest to her, persuade her to take (in the sense of buying) or dissuade her from buying; such consultation was part of the sale.

His Honour: That is contrary to the opinion of Baron Bramwell. His lordship stated that if a person entered a chemist's shop and asked for something to cure the headache, and the chemist gave him some medicine, he would be technically infringing the terms of the Act, although it would be very unreasonable for the Society to interfere in such a case. I am not prepared, however, to adopt in its entirety the view of the learned Baron. I draw the line, and say, if a person goes to a chemist, suffering under a disease the nature of which he does not know, but believes the chemist does, and he takes the ordinary means of ascertaining what that disease is, and then prescribes medicine to cure the disease, which by examination in any way you like is found out, then he steps beyond his province as a chemist, and adopts that of a medical man. I should be very wrong indeed, however, in saying that such a learned judge as Baron Bramwell is not right; nevertheless, my own view is that it is too strict an interpretation of the Act. If Mr. Herbert contends that a chemist is entitled to prescribe I should like to know the object for passing the Act.

Mr. Herbert: To prevent unqualified persons from practising. On the face of the 28th section, it is shown that a chemist is qualified for something.

His Honour: No doubt that Act proceeded upon the assumption that only those who had received a proper education and had passed the Apothecaries' Company were persons who ought to treat diseases. If you are right, Mr. Herbert, in supposing that a chemist could do so before, after the Act was passed so doing would be an infringement.

Mr. Herbert: Apothecaries might attend patients at their residences and chemists at their own shops might prescribe in minor cases.

His Honour: What authority is there for saying that the chemist might prescribe for minor ailments, and where would you draw the line?

Mr Herbert: By exercising discretion as we did prior to 1815.

His Honour: The section to which reference has been made, provides against the trade of a chemist in buying, preparing, compounding, dispensing, and vending medicines, nothing is said about prescribing. It appears a very good Act, and ought not to be infringed. I did not think the Apothecaries' Company intended to interfere in trifling cases, and I am not of opinion that if a chemist gave a man something for the toothache or headache, he would be infringing the Act. I think they should take it for granted that the company have grounds for taking these proceedings in the interests of the public, for whose real benefit the Act was passed.

Mr. Nathan remarked that as long as chemists confined themselves to the buying, preparing, compounding, dispensing, and vending of drugs, they would not be open to any interference. All cases he said were taken up by the Society after careful consideration.

His Honour: Do I understand you to say there is an appeal now pending relative to a similar case?

Mr. Herbert: There is.

His Honour: On this very point.

Mr. Herbert: Yes.

His Honour: Then probably you will wish that no judgment shall be given until that appeal is decided?

Mr. Herbert: That is what we should like.

His Honour: Then I shall not give judgment in the case until that appeal is decided, unless the defendant applies himself for judgment. Mr. Nathan will, however, have a right to ask for judgment supposing the appeal is not prosecuted with due diligence.

THE PERSONATIONS AT THE PRELIMINARY EXAMINATIONS.

On Monday last, July 9, Frank Oates, to whose arrest reference was made last week, was brought up on remand at Bow Street Police Court, charged with fradulently procuring his registration under the Pharmacy Act, 1868, and Andrew Ritchie Hunter was charged with aiding and abetting him in the same. They were also jointly charged with conspiracy. Mr. Douglas Straight, instructed by Messrs. Flux and Co., appeared on behalf of the Pharmaceutical Society.

Evidence having been given as to the arrest of Oates, the forms of application sent in on behalf of Oates were put in, and it was deposed that they were filled in in the handwriting of Hunter.

Mr. James Thomas Gwatkin, the Local Secretary of the Pharmaceutical Society at Brighton, deposed that in April, 1876, he superintended an examination on behalf of the Society, in the Pavilion, and that a person named Frank Oates was one of six candidates then to have been examined. One of the candidates who attended that examination now deposed that he saw Hunter present.

Upon this evidence, the defendants, who made no answer to the charge, were committed to take their trial at the Central Criminal Court. Bail was allowed.

THE SALE OF LAUDANUM—CENSURE OF A CHEMIST'S ASSISTANT.

At the Margate Quarter Sessions, on Wednesday, July 4, James Thomas Rowe, 15, a pot-boy, was indicted for attempting to commit suicide by taking a quantity of laudanum on the 18th June. On being placed in the dock and charged in the usual way the boy pleaded guilty, and began to cry.

Mr. Duckett, the boy's master, said that the only reason he could give for the boy taking the laudanum was that he had occasion to find fault with him about an hour and a half before the boy took the poison.

Addressing the chemist's assistant (Mr. F. S. Morton, of Zion Place), who served the poison, the Recorder (F. J. Smith, Esq.), asked him how he came to sell a lad like that poison, to which the assistant replied that there was a discretionary power.

The Recorder: But do you think it was exercising a wise discretion to sell poisonous drugs to a boy like this?

The Assistant: He told me it was for his master.

The Recorder: Should you let him have it without a medical certificate?

In answer to this the assistant stated that laudanum was principally used in this part of the country for external applications, and they never got asked for it to be used internally; it was largely used internally in the Midland Counties and the North, but not in Kent. Witness was now assisting his father, who was carrying on business at Ramsgate.

The Recorder: Well, unfortunately you have sold laudanum to this child, and he bought it for the purpose of making an improper use of it. Perhaps it will be a caution to you in the future not to sell it to a child. If a child comes for a poisonous drug, even if he is sent by his master, there ought to be some note from the master to satisfy the chemist that it is to be used for a proper purpose. Fortunately for you and the boy in this case it did not take effect. If he had died it would have been a matter of very serious moment to you in having supplied the drug to him without due caution.

In reply to the Recorder, Mr. Duckett said that he ascertained the boy had taken the poison a few seconds after he had obtained it, he believed.

The Recorder: I see it was taken in beer.—Mr. Duckett: I do not know anything about that. I sent for the medical man, and he came directly.

Mr. Mosse (Counsel for the prosecution): He vomited freely, and that no doubt saved the boy's life, and the chemist as well.

Mr. King, surgeon, on being called by the Recorder, said that when he was called in to attend the accused the effects of the poison had then passed away.

The Recorder: Would twopennyworth have been sufficient to take away the boy's life if it had taken effect?

Mr. King: Yes, it would. I believe he took two drachms of laudanum, and that is the minimum dose to destroy the life of an adult. I believe twopennyworth would be about two drachms and be quite sufficient to destroy life. It is however a very uncertain poison. I asked him why he took it, but he gave me no answer, only admitting that he did it.

The Recorder dismissed the lad on his father entering into recognizances of £50 for him to keep the peace for twelve months.

POISONING BY CARBOLIC ACID IN A WORKHOUSE.

On Monday last, Dr. Hardwicke held an inquiry at St. Pancras Coroner's Court as to the death of John Page, aged 77, a patient in one of the male infirm wards of St. Pancras workhouse. From the evidence of Eliza Powell, nurse of the ward, it appeared that carbolic acid in bottles labelled "Poison, carbolic," was kept in the ward for disinfecting purposes, in a cupboard among other bottles containing black draughts and other house medicines. On the morning in question deceased asked Jane Connelly, the pauper helper, for some house medicine, whereupon Connelly, who could neither read or write, poured a large dose of carbolic acid into a wine glass and gave it to deceased. Dr. Dunlop, the medical officer, was immediately sent for, but death took place in about five minutes.

Mr. Fildew, on behalf of the guardians, said there had evidently been a fatal mistake. He could not understand how the paid officer could have allowed the carbolic acid to pass into the hands of a scrubber or pauper help. He would bring the whole matter before the guardians, who would thoroughly investigate it, and take steps to prevent the recurrence of a similar calamity. The jury, on Mr. Fildew's assurance, agreed to a verdict of "Death from misadventure.—*Daily News*.

SINGULAR CHARGE OF POISONING.

On Tuesday, July 10, at the Manchester Assizes, Martha Barker, a domestic servant, was charged with administering poison to her mistress, a Mrs. French, with intent to murder her. Mrs. French being ill, the prisoner was sent to the doctor's for some medicine for her, and she returned with a bottle of medicine which she said the doctor had told her she must make her mistress take, and that it would probably make her ill. Mrs. French took two doses of the medicine and became very ill, and it was afterwards found that there was red precipitate in the medicine, and the doctor said he did not keep this poison in his surgery at all. There was not, however, sufficient poison to prove fatal, according to Taylor's 'Medical Jurisprudence,' which the Judge consulted on the point, and the jury acquitted the prisoner.—*Daily News*.

ALLEGED ATTEMPT TO POISON WITH SALT OF LEMONS.

At Salisbury, on July 6, in the Crown Court, before Mr. Justice Lindley, John Smith Flemmon, aged fifty-six, a labourer, was indicted for attempting to poison his wife. The case for the prosecution was that in May the wife of the prisoner, a young woman of twenty-one, had made a pot of rhubarb jam, and that on the evening of the 11th the prisoner had pressed her to take some of it and again the next morning: that she then noticed something white in the jam, and immediately took the pot to two neighbours to show it to them; that one of them retained a small quantity of the jam, while the rest, which the wife took into her house again, was thrown into the fire by the prisoner. It was proved that the prisoner had purchased a pennyworth of salts of lemon on the 7th or 8th of May, saying it was to take ironmould out of his shirts. It was also proved that the prisoner and his wife, who had been married about a year, lived very unhappily together. The jam which was not thrown into the fire was analysed, and found to contain oxalic acid in sufficient quantity to be dangerous to life. The prisoner, when apprehended, said that he had bought the powder to take ironmould out of his shirts, and that if the powder found in the jam was the same, his wife had put it there to kill him.

For the defence it was urged that the only evidence to connect the prisoner with the placing of the powder in the jam was that of the wife, who might have found the packet (which was labelled "Poison") and herself placed the powder where it was discovered for the purpose of founding a charge against her husband.

The prisoner was acquitted.

Dispensing Memoranda.

We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible considerable latitude will be given to the definition of wha, may be considered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.

[5]. Sulphur Hypochlorite.—In part answer to this correspondent I may say that I have several times dispensed the prescription ung. sulph. hypochlor., in the proportion of one drachm of the sulphur preparation to one ounce of benzoated lard. This was according to the direction of one of our leading surgeons. The sulph. hypochlor. used was in ℥j stoppered bottles, but I forget the name of the maker. In regard to its explosive properties, I have never known it to explode spontaneously, but a slight tap on the bottle is generally sufficient to set it off. On one occasion (the first I believe), the stopper of the containing vessel was fast, and on tapping it with a knife the bottle exploded and the contents took fire at a gas jet near which I was standing. There was a flash of blue flame and I found myself minus the greater part of my eye-lashes and eyebrows, and with an incrustation of what appeared to be sulphur upon my face and coat, while the counter was covered with small pellets of the same substance. Whether the flame was simply due to the particles of dust coming into contact with the gas flame, or whether it was caused by the liberation of some combustible gas I leave to be decided by abler hands, but I believe in all probability the latter, as you can have no explosion without chemical action.

S. L. S.

[5]. Sulphur Hypochlorite.—I fancy that "Occident's" experience of that highly inconvenient as well as malodorous substance, sulph. hypochlor., can be paralleled by many similar instances. About a month ago my stock of it blew a piece out of the shoulder of the bottle and emitted a large volume of the offensive vapour which he describes. It was bought in May, 1876, and the bottle had been only partially filled, for as soon as I received it I mixed some with an equal weight of benzoated lard, securing it as well as I could in a covered pot. This has undergone no change in colour or consistence but is quite free from smell, although I well remember the disagreeable effects which accompanied its preparation. I have a dim suspicion that the chemical energies of the hypochloride, so called, are usually expended on the unhappy dispenser to whose lot it falls to open the stock bottle and compound the ointment therefrom; and that the patient's needs would be as effectually served by simple sulphur ointment.

J. F. Brown.

[5]. Hypochlorite of Sulphur.—There is no test for the strength or purity of sulphur hypochlor., it being a very indefinite compound. The explosion was probably due to volatilization of the sulphur chloride, and I have always found the odour more pungent when the chloride of sulphur is mixed with powdered sulphur than when prepared by passing chlorine over the surface of sulphur till no longer absorbed. The formulæ for the unguents may be found in Beasley. More information will probably be given before the Conference.

E. S. Balchin.

[6]. Chloric Ether.—With respect to this question one of your correspondents draws a distinction between æther chlor. and spt. æth. chlor., which I think is not usually admitted, the two names being considered synonymous. When chloric ether is ordered generally a stronger solution of chloroform than that of the Pharmacopœia is used. The use of this stronger solution of chloroform for prescriptions written before the 1864 Pharmacopœia was published, would be correct, but it is questionable whether it should be used for prescriptions written after that time. Previous to the 1864 Pharmacopœia spirituous solutions of chloroform (so called chloric ether) of strengths varying from 1 part of chloroform to 6, 7, 8, and 9 of spirit were in use. Spirit of chloroform was, I believe, introduced into the Pharmacopœia to supply a want felt for a definite solution of chloroform and which would be more readily miscible in ordinary mixtures than the strong solutions formerly in use. By "æther chlor." a spirituous solution of chloroform is meant, and as we have an authorized formula, I think it should be used in preference to a variable solution there is no authority for. With regard to the case of lac sulphuris quoted by your correspondent (Mr. Mackay), I think scarce any one would object to the use of precipitated sulphur any more than they would hesitate to use spt. ætheris nitrosi for sweet spirit of nitre when ordered. In both cases the distinctions were made on technical grounds to set aside what was looked on as arbitrary prosecutions, but not to establish their absolute adoption.

E. M.

[8]. Carbolic Acid Mixture.—Mix the acid. carbolic. (No. 5, Calvert's), ʒj., well together with mucilage of gum acacia, ℥j, in a mortar, then gradually add (stirring) the water with perchloride of mercury, ʒij, previously dissolved to ℥viij. This mixture can be added afterwards to any quantity of cold water, and it will not separate.

C. Campbell.

Notes and Queries.

UNUSUAL SPECIMENS OF ATROPA AND HYOSCYAMUS.—Two years ago an unusual monstrosity in *Atropa belladonna* came into my hands. It was from a garden plant growing at Stanninghall, Norfolk, and is an example of what are called fasciated branches. It consists of a long, flattened, ribbon like-branch with the following dimensions: length of the flattened part, 43 inches; breadth at the apex, 4 inches; at the base, 1¾ inch; circumference at apex, 9 inches; at base, 4⅝ inches. As these measurements show, it tapers gradually from apex to base, losing at the same time its flattened shape and becoming rounded just above its point of union with the root. On each of the flattened sides were about fourteen faintly marked rounded ridges; these ridges were marked with scattered scars arranged in an obscurely spiral manner. These scars were probably produced by fallen or aborted branches. Along the edge of the apex at least forty-three branches were arranged in two rows; the two rows diverged from each other at an angle of about 60°, and between them a tolerably distinct naked path was visible. Outside the rows of branches and inserted on the flattened part were a few leaves and flowers, one pair of leaves being situated about six inches from the end of what I may call the ribbon. The branches were from one to two feet long, and were covered with leaves; numerous flowers and immature fruit being also present. This form of monstrosity is comparatively common among various plants. Several examples of it have occurred to me during the past two or three years. But as I have seen no record of its occurrence in *Atropa belladonna* I have thought it worth while sending this note.

A remarkable specimen of Hyoscyamus is described in Johnston's 'Botany of the Eastern Borders,' (London, Van Voorst, 1853) in the following words: "In a garden of Mr. Allanton, surgeon, there is now growing a plant of *Hyoscyamus niger*, of the following extraordinary dimensions and fecundity. It is 5 feet 4 inches in height, and in breadth its branches spread out to the same extent. It bears above 1000 seed vessels, and if we reckon each of these vessels to contain 300 seeds (which is a moderate computation, as I counted the seeds of one of the pods, not of the largest size, and found it to contain 326 seeds) the amount of the whole will be 300,000.—Geo. Henderson."

These dimensions are very remarkable and as they are recorded in a book which does not come much into the hands of pharmacists I have ventured to give them greater publicity.

WALTER G. PIPER.

REMEDY FOR DANDRIFF.—A French physician recommends that a solution of chloral hydrate containing five per cent. should be applied to the scalp by means of a sponge every morning. The quantity employed should be from one half ounce to one ounce. A slight burning sensation and reddening of the scalp occurs, disappearing after two minutes. If the hair has fallen off in consequence of the dandriff, it will be renewed in about a month.—*Cincinnati Lancet.*

[549]. GREY AND WHITE LIME.—"*Bricklayer*" would be glad to have the difference, if any, between "Grey Lime" and "White Lime" explained. Also whether Grey Lime would do equally well for the manufacture of Lime water.

[550]. TINCT. COLCHIC. C. MORPHIA.—I should be much obliged if some one could give me a form, in the Journal, for Lavill's Tincture of Colchicum with Morphia.

R. MODLEN.

[551]. MARKING INK FOR SACKS.—Can any one oblige by giving me a receipt in Pharm. Journ. for marking ink for sacks?—INQUIRER.

Obituary.

Notice has been received of the death of the following:—

On the 7th of May, 1877, Mr. George Pitt Foster, Pharmaceutical Chemist, Tetbury, Gloucester. Aged 60 years. Mr. Foster had been a Member of the Pharmaceutical Society since 1855.

On the 14th of May, 1877, Mr. John Harper, Chemist and Druggist, Leamington. Aged 35 years.

On the 28th of June, 1877, Mr. William Geldart, Chemist and Druggist, Boroughbridge. Aged 23 years. Mr. Geldart had been an Associate of the Pharmaceutical Society since 1873.

On the 2nd of July, 1877, Mr. William Williams, Chemist and Druggist, Coedpoeth, Denbighshire. Aged 36 years. Mr. Williams had been a Member of the Pharmaceutical Society since 1872.

On the 4th of July, 1877, Mr. Thomas Figg, Chemist and Druggist, Lewes, Sussex. Aged 69 years.

Correspondence.

**** No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE SALE OF LAUDANUM.

Sir,—I have taken the liberty of sending, by a preceding post, a copy of Keble's *Margate Gazette*, containing a report of the trial of a boy for attempting suicide by taking laudanum.

I should not have called your attention to the circumstance (especially as the assistant now in charge of the business is my son, whose aid was sought in the sudden and alarming illness of the late principal, and who is now acting under my supervision until the business shall be transferred to a successor) but for the remarks of the learned Recorder and others, reflecting severely on the assistant for supplying laudanum to a boy of fifteen years old, apparently arising from an imperfect acquaintance with the relation in which a chemist stands to the public when called upon to supply a preparation in such frequent demand as laudanum, and with the regulations to be complied with in meeting the applicant's requirement.

The facts are as follows:—

A boy apparently not under sixteen years old, asks for twopennyworth of laudanum.

Assistant: What is it for?

Boy: I don't know.

Assistant: Who is it for?

Boy: My master, Mr. Duckett.

Assistant: Do you know it is poison?

Boy: Yes.

Two fluid drachms were then supplied, labelled "Laudanum," Poison, with the seller's name and address, printed in black letters on a red ground. The boy was also told to be careful with it as it was poison.

Mr. Duckett being the proprietor of a respectable house within a minute's walk of the shop, no further hesitation was felt in supplying it.

About a week after, a policemen brought part of the broken bottle with the label entire, inquiring respecting it, and was informed of the particulars related.

The officer then stated that the boy had that morning (about a week having intervened since obtaining it) drunk it, and that the assistant's evidence would be required, as the boy was in custody for the attempt on his life.

The examination of the boy before the magistrate led also to similar severe remarks (parts only reported) about the carelessness and indiscreet mode of supplying poison to children.

I ought to say that the boy in question, called a "child," has attained his sixteenth birthday, and was in receipt of sixteen shillings per week with a regular daily allowance of three glasses of beer, and was not considered by the assistant as a "child" to whom he could refuse to supply the laudanum, especially as the boy was known to be in the employ of the person for whom he stated it was required.

The boy it seems had provided himself with the poison fearing detection of some delinquencies.

It seems to me that where the legal requirements in supplying laudanum have been complied with, and the schedule showing such requirements had, as in this case, been produced, and due caution also given to the purchaser, a better understanding of the state of the law might save from these castigations those who have really complied therewith.

HENRY MORTON.

The Elms, Ramsgate,
July 9, 1877.

PHARMACY IN AUSTRALIA.

Sir,—In the hope of preventing distress I am induced to indite a few lines on the subject of the emigration to Australia of English chemists, which you will much oblige by inserting in the next issue.

Nearly three years ago I came to Australia. I had passed the Minor examination and was seeking a berth as a chemist's assistant. I had several letters of introduction to leading houses, and fortune favoured me, for before a month had elapsed I found a home in a bush town in Victoria, at a salary of 30*s*. per week for first six months, and £2 per week afterwards. Three months before my arrival here I had been earning only £30 per annum, consequently, I thought Australia a "grand place," and wrote glowing accounts home to my professional friends urging them to follow my example. Fortunately not one of them took my advice, for I have since found out that it was only by a piece of good luck that I was not kept waiting for months; and since I have been up here, although it is only a small town, three young chemists (two qualified) have begged money for a night's lodging, and told doleful tales of going unsuccessfully over the colonies in search of employment. Also several cases have come under my immediate notice, where men educated as chemists have had to go on a station (sheep tending) or do any menial work they could obtain, in consequence of their inability to get a situation in their own trade. My advice to intending emigrants is, "Do not come unless you have sufficient money to live without work for six months, and if you have enough capital to open a business at home do not come at all—unless it be a question of health—for a more remunerative business can be had in England for £500 than here for £800." Chemists in proportion to the population are much more numerous here than at home, and although the fact of surgeons seldom dispensing their own medicine is one advantage over the old country, yet that is quite counterbalanced by nearly all the stores selling drugs and patent medicines at low prices; in some parts 1*s*. $1\frac{1}{2}$*d*. articles sell at 1*s*, when the advanced wholesale price leaves only an apology for a profit.

I have made these remarks in a friendly spirit and not for the sake of discouraging those who would like to see the other side of the world On the contrary, I say to any one who has some spare cash and does not mind working harder and roughing it that he can do better here (as an assistant) than at home; but beware of coming out and leaving too much to chance, for the demand is very limited.

I may add that in Victoria, N. S. Wales, and Tasmania, pharmacy acts have been passed and examinations are necessary.

AN AUSTRALIAN.

"NO DISSENTER NEED APPLY."

Sir,—I consider "Fraternity" has given the right solution to "Equality's" problem in a recent number, and I fully intended sending a reply of a similar purport, last week, but forgot. I know that churchmen (like Methodists) are very conservative in patronizing tradespeople of their own denomination, particularly if the shopkeeper acts as a Churchwarden. This custom is more prevalent I believe in agricultural districts than in manufacturing cities, so that if the case in question be of the former type, *a dissenter* would run a poor chance of retaining the customers of his predecessor.

JAMES B. L. MACKAY.

Newcastle-on-Tyne, 3rd July, 1877.

"*Œnanthe.*"—(1) *Epilobium montanum*; (2) *Artemisia vulgaris*; (3) Not in flower: it looks like *Circæa lutetiana;* (4) *Œnanthe crocata*; (5) *Veronica officinalis*; (6) *Scrophularia nodosa*; (7) *Alisma Plantago*; (8) *Lysimachia nemorum*; (9) *Sisymbrium officinale.*

"*Claviceps purpurea.*"—We presume the prescriber had some object in view, but what that was is not perceptible to us.

"*Syrupus.*"—(1) *Ranunculus flammula*; (2) *Melilotus officinalis*; (3) *Prunella vulgaris*; (4) *Ceratodon purpureus*; (5) The outer stamens are longest in the tribes mentioned.

F. C. B.—*Habenaria chlorantha*; *Equisetum sylvaticum*; *E. arvense*; *Lychnis Flos-cuculi*; *Senecio aquaticus*; *Carduus pratensis.* The *Senecio* and the *Carduus* we cannot name with certainty; no leaves are present. *F. C. B.* should send better specimens and attach numbers to each.

"*R. Spro.*"—*Essence of Smoke.*—Crude pyroligneous acid, 1 pint; sugar colouring, 2 ozs.; dissolve, and in a week decant the clear portion. Other recipes for essence of smoke may be found in Cooley's Cyclopædia.

A Warning.—We have received from Mr. L. Dotesio, of Bilbao, a communication giving an account of "an accomplished rascal who by his artful blandishments has succeeded in transferring some £25 from his soft-hearted friends' pockets into his own." The means of introduction to Mr. Dotesio was a prescription ordering potass. bromid., syrup. aurant., and aq. menth. pip., which now bears the mark of the English Pharmacy at Bilbao, No. 8193, 1877.

"*Inquirer.*"—(2) The answer to your question would possibly depend upon what would be implied by such a name.

Herr Platz.—(1) See Gmelin's 'Chemistry,' art. "Sugar." (2) A candidate must comply with the regulations in force at the time of his presenting himself to enter for an examination.

"*Alpha-Beta.*"—Not unless it otherwise comes under the provisions of the Medicine Stamp Act by its being represented to be a proprietary or occult preparation, or useful in the cure or relief of disease.

W. Young.—We quite agree with you that comment is needless and that competition with such prices is out of the question.

Gadus Morrhuæ.—The subject of your first question is dealt with on another page. With respect to the second we are unable to give you the information you ask for.

H. Humphry.—Darby prepared bichromate of ammonia by partially saturating chromic acid with ammonia, and evaporating to the crystallizing point (Gmelin's 'Chem.', iv., 142).

"*Inquirer.*"—The reaction of bromine with ammonia does not give rise to the formation of bromate, and is represented by the following equation:—

$$4NH_3 + 3Br = 3NH_4Br + N.$$

"*Syrupus.*"—A table of the percentage of cane sugar in aqueous solutions of different densities will be found under the article "Sugar," in Watts' 'Dictionary,' vol. v., p. 47

"*Vincere.*"—(1) *Scutellaria galericulata*; (2) *Cakile maritima*; (3) *Galeopsis versicolor*; (4) *Antirrhinum Orontium*; (5) *Senebiera didyma*; (6) *Valeriana officinalis*; (7) *Galium cruciatum*; (8) *Euphrasia Odontites*; (9) *Honkeneja peploides.*

D. B. Dott.—Your note has not been overlooked, and shall receive attention at the first opportunity.

"*A Candidate.*"—We are not in a position to say with certainty, but we presume that the words should have been *venation* and *vernation*, and that by a printer's error the letters at the commencement of each word were transposed.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Young, Carlsbad Mineral Water Company, Mr. Vizer, E. M., Philomas, Atom, Spes.

COSTUS.

BY M. C. COOKE, M.A., A.L.S.

Botanical Origin.—*Aplotaxis auriculata*, D.C. (*Aucklandia costus*, Falc.), is a composite plant inhabiting the North Western Himalayas. According to Stewart it grows at from 10,500 to 13,000 feet in parts of the basins of the Jhelam and Chenab. Under the name of *Saussurea hypoleuca*, Spr., it is included in Clarke's 'Compositæ Indicæ,' and is said to extend from Sikkim to Kashmir at an elevation of from 7000 to 12,000 feet. The "Koot" or "Costus" root of which we have any knowledge at the present day has no relation whatever to the plant *Costus speciosus*, Sm., or *Costus Arabicus*, Linn., with which it is sometimes confounded. Dr. Falconer was the first to trace the drug to its true source, and although Dr. Royle at one time seems rather to have considered it the produce of an umbelliferous than a composite plant, there appears to be no ground for the suspicion.

Native Synonyms.—The native names determined by Surgeon Moodeen Sheriff are—

Qust, *Arab.* Kosht, Kost, *Pers.* Pachak, Kut, *Dukh.* Goshtam, *Tam.* Goshtamu, *Tel.* Koshtam *Sans.* It is the orris root, patchuck, putchuck, or ooplates, of the trade lists and returns, and the Pachak of Bengal. In China it is known as Muh-hiang and Kwang-muh-hiang.

History.—Costus was well known to the ancients, and the account given of it by Dioscorides is to the effect that "Arabian Costus is best; it is of a white colour, and light, and emits a very grateful and sweet odour. Indian Costus holds the second rank; it is thick and light like ferula. The third sort is the Syrian, which is heavy, in colour like boxwood, and emitting a strong odour. The best Costus is that which is fresh, light coloured, compact, and of firm texture, dry, not worm-eaten, devoid of an acrid smell, and which tastes hot and biting."

The Persian Hukeems have founded their account of Costus upon that of Dioscorides. In the Toftehool-moomineen, cited by Falconer, it is stated that "Koost is a root resembling in appearance that of the Mandragora, and comes from the borders of Hindoostan. The plant which yields it is humifuse and stemless, and has broad leaves. There are three sorts; the first, called Arabian or Ocean *Koost* (Koost Arabee and Koost buhree), is sweet, light, white, and fragrant. The second called Indian *Koost*, is of a dirty yellowish colour, light, thick, bitter to the taste, and having but little fragrance. The third is of a dirty red colour, and heavy, and in weight (or colour) like boxwood, and fragrant, and without a bitter taste. What follows refers to the first sort, or sweet Koost. The best is what is fresh, white, not worm-eaten, and having a hot, biting taste. It retains its virtues good for four years; and the difference between it and Elecampane (*Rasun*) or Damascus Koost is in this, that Elecampane is harder, and has not the fragrant odour and biting taste of Koost. Koost is hot and dry in the third degree; it is diuretic, revulsive, emmenagogue, hepatic, deobstruent, a universal antidote to animal poisons, attenuates the secretions, a powerful aphrodisiac, vermifuge, lithontriptic," etc., etc.

Dr. Falconer maintained that the *Aplotaxis* was the Costus of the ancients for the following reasons:

1. It corresponds with the descriptions of the *Costus* given by the ancient authors.

2. Coincidence of names: in Kashmir the root is called *Koot*, and the Arabic synonym is said to be *Koost*, both given as synonyms by the Persian Hakeems, and names by which the medicine is known in all the bazaars of the Hindoostan Proper; in Bengal the Kashmir *Koot* is called *Putchuk*, and it appears by a note in Dr. Royle's illustrations that Garcias ab Horto gives *Pucho* as the Malay synonym of Costus Arabicus.

3. Koot is used at the present day for the same purposes in China as Costus was formerly applied to by the Greeks and Romans.

4. The direct testimony of the Persian authors that *Koost* comes from the "borders of India," and that it is not a production of Arabia.

5. The commercial history of the root gathered in Kashmir under the name of *Koot*. It is collected in large quantities and exported to the Punjab, whence the larger portion goes down to Bombay, where it is shipped for the Red Sea, the Persian Gulf, and China; a portion of it finds it way across the Sutlej and Jumna into Hindoostan Proper, whence it is taken to Calcutta, and bought up there with avidity, under the designation of *Putchuk*, for the China market. Upon these grounds Dr. Falconer held that the plant described by him under the name of *Aucklandia* was undoubtedly the source of the Costus of the ancients.

Although but little reliance is to be placed on Honigberger, he repudiates the idea that the plant described by Falconer yielded the Costus of the ancients. He says it may be the *Costus niger Cashmereanus*, but that the true *Costus*, the *Costus veterum*, was *Costus Arabicus*; which is probably brought from Arabia into India, and is used by the Hakeems in a variety of diseases. After a residence of many years at Lahore it is surprising that his knowledge on this subject is so confused. The drug of the Hakeems is undoubtedly the Kashmir "Kut."

Still more curious is the account of *Costus* contained in Pomet's 'History of Drugs,' in which it is stated that the Arabian Costus is the root of a shrub very like an elder tree, which grows plentifully in the happy Arabia, from whence it takes its surname. The chief use of this root, he adds, at present is in the composition of Venice treacle and others of that kind. In a similar vein he discourses of *Costus Indicus*, with a like result.

Although preceding in time of publication the above remarks from Dr. Falconer, it will be of interest to associate with them, in full, the observations of another equally celebrated writer on Oriental materia medica.

Dr. Royle, in his 'Illustrations' (pp. 360), says that "in the bazaars two or three kinds of root are met with, having a general resemblance to one another, and known by the name *Kooth*, Arabic *Kust*; to this *Koostus* (κοστος) is assigned as a Greek, and *Koshta* as a Syriac name. Three kinds are described—(1) sweet, light, and white; (2) black, light, bitter, without fragrance; (3) reddish, and heavy like boxwood. These evidently refer to the three kinds described by Dioscorides, under the the names of (1) Ἀραβικος λευκος; (2) Ἰνδικος; (3) Συριακος. I was only able to meet with two kinds, one called *Koost hindee*, and *Koost tulkh*, Indian or bitter Costus, and said to be brought from Mooltan. This is probably the κοστος ινδικος of Dioscorides. The other kind is called *Kust sheeren*, with the synonyms of *Koost-buhree* and *Koost-arabee*, which is of a light yellow colour, with a very pleasant fragrant odour, said to be brought into India from Caubul and Cashmere. It is said by the native authorities to be produced by a plant having a root like *Atropa mandragora*, without stem, with spreading succulent leaves. This root is found in every bazaar, and is what, I believe, is commonly called Indian orrice (iris) root, and must form an extensive article of commerce. It does not appear to be produced in any part of India, though I am inclined to think that under the name *puchuk* it forms one of the exports from Calcutta to China, where the substance is probably employed as incense. On comparing the specimens of the sweet Costus in my collection of materia medica with those of *Puchuk* bought in the Calcutta bazaar, I am unable to perceive any difference, either in appearance or flavour." Afterwards, in a note on the same page, the author writes: "I have been favoured with a visit from Mr. Beckett, long resident in Allygurh, who informs me that he used to procure this Indian orrice root from Umritsur, under the name of *Koot*, to send to Calcutta, where it was sold by the name of *puchuk* or *puchook* for export to China. He also states that the roots frequently had attached to them pieces of the stem, which were hollow and angular, and appear from description to be those of a channelled umbelliferous plant."

In 'Punjab Products' (p. 356) the writer says, quoting from Dr. Johnstone, "When in Kashmir last year, I endeavoured to trace the Costus, and after toiling up many a rugged mountain pathway, was rewarded; but the root stock alone existed buried in snow, which clothed its habitat so late as June. Leaving the valley, I directed two intelligent servants, one on the Indus, the other on the Punjab side of Kashmir, to wait until it had bloomed, and was seeding. Owing to the unusual severity of the season, a good collection of plants was not obtained until the end of September. Eight of those were carefully removed, imbedded in their natural soil, and safely landed at Gujrat, when I replanted them." As the snow melts in the end of March the root stock appears, its caudal leaves develop in the beginning of June, and it comes to full fruition in September. It is a perennial, leaves and stem dying yearly to the root stock; the exstipulate caudal leaves rise in threes, the two lateral spathing the centre; the centre sheathing the stem as it shoots above ground. The stem, two or three of which may arise from the root stock, stands in adult growth forty inches, is fluted, lined internally with pith, and sheathed with exstipulate tristichous leaves. The root stock varies in size from nine to fifteen inches in length, and from three to twenty-one inches in thickness. The caudal leaves spring straight from the root stock, and are supported on petioles eighteen inches long. The leaves are simple, obcordate, eight by five inches in adult growth and strongly veined."

At the present day we have heard of no other *Kut* which is known in India than that which comes down from Kashmir, and its substitutes or adulterations. Prefixes and affixes to the name appear to indicate only minor differences, as of age or locality. Three of Dr. Royle's original specimens have been consulted. One of these (No. 148) is identical with the false *Kut*, hereafter described; this is merely marked "Koot;" another is the *Aplotaxis* root (No. 150) marked "Koot Tulkh" from Umritsur. The third specimen (No. 147) is so far advanced in decay that it is impossible to say what it is. It is marked "Koot, Aucklandia costus." It is possible that the farinaceous, inodorous root (No. 148) may be the "Koost shirin" of the natives, but of this there is no direct evidence. It is not uncommon to find the same native name applied to two or three similar substances.

Description.—The root, as met with in the bazaars, consists of irregular pieces from two to three inches in length, and scarcely an inch in diameter, cylindrical, with a rough and somewhat reticulated surface, and very compact and brittle. Internally it is dirty white, with radiating bundles leaving numerous small cylindrical channels filled with a brownish resin. There is no distinct bark or central medulla. When cut or rubbed it has a strong and definite odour resembling that of violets or orris root. In taste it is at first camphoraceous, and then bitter with a slight pungency, but by no means unpleasant. The genuine root does not appear to be at all subject to the attack of insects, although fragments of foreign roots introduced as adulterations are nearly destroyed. Of the two varieties of root that called *Kut tulkh* is probably the old and *Kut shirin* the young root. Dr. Stewart hazarded the opinion that *Kut shirin* is the produce of a different and unknown plant. Two specimens collected in Kashmir under the names respectively of *Tet Khot* and *Muder Khot* do not appear to differ except in size.

Composition.—Hitherto we have found no record of any chemical examination of this root, although it is one which certainly offers many points of interest. At present our own microscopical examinations have been very superficial, sufficient only to show that starch only exists in very small quantities, and of a character quite different from that of the false root hereafter alluded to.

Collection and Preparation.—The roots are dug up in the months of September and October, when the plant begins to be torpid; they are chopped up into pieces from two to six inches long, and exported without further preparation. The quantity collected is very large, amounting, as far as Dr. Falconer could learn, to 10,000 or 12,000 khurwars (of 192 lbs., or about two million pounds per annum). The commodity is laden on bullocks, and exported to the Punjab, whence it finds its way to Bombay, and a portion gets to Calcutta through India. In Dr. Falconer's time the cost of collection and transport was about half a crown per hundredweight.

Commerce.—The Sanscrit name, *kashmirja*, of the root indicates the chief place whence it was brought. Cleghorn states that it is also exported from Pangi on the Upper Chenab to the plains. The loads of it when passing scent the air to some distance. A great part of the imports into the Punjab pass through to be sent to China. Davies' 'Trade Report' gives twenty maunds as exported to Affghanistan *viâ* the Bolan. Royle mentions that in one year (1837-8) 6697 maunds of this root, valued at Rs. 99,000, were exported from Calcutta to China, and in 1867-8 347 cwt., nearly 10.000 maunds, were exported from Calcutta to China. In Kashmir territory the Maharaja is said to take it over from the collectors at half the price at which he sells it again. In 1864 his income from this source was put down on good authority (according to Dr. Stewart) at 300,000 chilki, equal to nearly 190,000 rupees; but this, he adds, is scarcely credible. Koot is imported into Leh in small quantities from Kashmir for exportation to Lhassa, where it is called, as well as by the Bhotes, *Rusta*, and is used for incense. In 1871, 33 maunds were imported into Leh from Kashmir, valued at Rs. 672. According to Dr. Falconer, at the time he wrote the cost of collection and transport to a depôt at Kashmir was 2*s.* 4*d.* per cwt.; on entering India its value was enhanced to from 16*s.* 9*d.* to 23*s.* 4*d.* per cwt., whilst the commercial value at Canton was 47*s.* 5*d.* per cwt., an immense increase upon the cost in Kashmir. As this drug is not enumerated in the recent trade returns of Bombay or Bengal the amount of exports cannot be ascertained.

From the consular reports we find that in the year 1875 the imports of Costus into two Chinese ports only were for Hankow 1270 piculs, valued at £5224 6*s.* 3*d.*, and Chefoo 277 piculs, valued at £1197, so that it is clearly no insignificant article of Chinese commerce.

Uses.—Dr. Irvine states that formerly, when opium was not produced in Rajwarra, this root was extensively smoked as a stimulant. He adds that it is said to be narcotic when thus used, and that formerly great quantities went to China for smoking purposes. At the present time it is chiefly used as a perfume, as a protection of bales of cloth from insects. In the Punjab it is applied in powder to ulcers, for worms, in wounds, etc., and for toothache, and it is also given in rheumasm. Locally it is used also for hair powder. Assistant-Surgeon Raheem Khan says that it acts as a diuretic, emmenagogue, absorbent, and as an antidote for animal poisons. It also acts as an aphrodisiac and anthelmintic. He adds also that it is a good tonic for the liver and stomach. A summary of the uses of this drug is given by Baden Powell in his 'Punjab Products,' in the following terms.

1. Dried and powdered as the principal ingredient in an astringent stimulant ointment, applied to severe ulcerations.

2. Dried and powdered as a hair wash.

3. As a stimulant in cholera, an infusion is made of Cardamoms 1 dr.; Fresh "Kut" 3 dr.; Water 4 oz. One ounce every half hour. It is doubtless a powerful aromatic stimulant, and would be serviceable in any spasmodic disease.

4. It is universally employed by the shawl merchants, as a mechanical protector of Kashmir fabrics from the attacks of moth and other vermin.

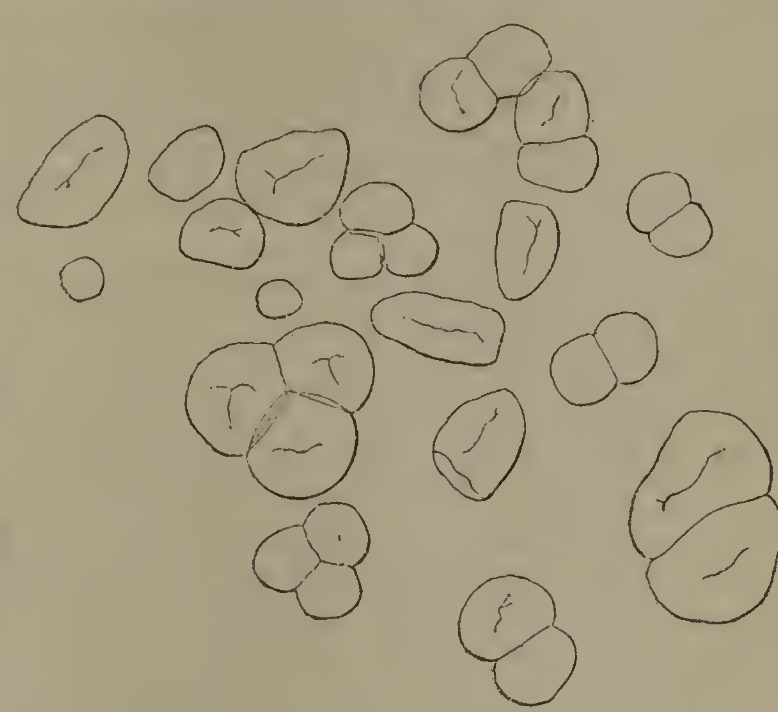
5. The dried root is an agreeable fumigatory, and yields excellent pastilles which burn fairly.

6. It is exported in enormous quantities, to China, where it is used as an incense. Lines of camels may often be met passing down to Multan, the "Kut" perfuming the air for a considerable distance; in every hong it is found; no mandarin will give an audience until the "pachak" incense smokes before him; in every joss house it smoulders before the Tri-Budh Deity; in every floating junk in the Chinese rivers, the only house of countless hordes, Budh's image is found, and the smoke of the "pachak" religiously wends its way heavenward; with the bulk of the Chinese, this ceremony is regarded as sufficient to propitiate the gods, while their merchants by substituting a spurious pungent article, endeavour even to mephitize their frowsy deity.

7. It is a crown monopoly, each village in the vicinity of the "Kut" fields is assessed at a fixed amount yearly, which must be delivered in the capital, the Maharaja's agents buy up the surplus at one maund per chilki rupee, and retail it double rate.

As to its uses in China, Dr. Porter Smith says that it is used in making incense in the south, or to preserve clothes from the attacks of moths and other insects. It is said to have the power of turning grey hair black. Carminative, stimulant, antiseptic, prophylactic, astringent, sedative, and insecticidal properties are referred to this remedy. The Chinese apply it with musk, which it resembles in odour and properties, to aching teeth.

Substitutes.—The Kashmiris say that this drug is apt to be adulterated with five or six other kinds of roots. Dr. Birdwood remarks that the root of a plant with the native name of *poshkar*, believed to be a species of *Ligularia*, is used for adulterating *Koot*, and the Kashmiris at Lahore make the same statement. A sample of false Costus in the Indian Museum, under the name of *Kut mitha*, consists of pieces of a cylindrical root from 1 to 3 inches in length and from ½ to 1½ inch in thickness, externally



Starch of False Costus.

nearly smooth, or longitudinally striate with transverse paler scars. It is much lighter and less compact than Costus, friable and farinaceous internally, very much subject to attack from insects, with little or no apparent odour or taste, and containing a large quantity of starch, the granules of which are very variable in size, attached to each other in twos and threes, as in the figure (drawn by camera lucida to a scale of 500 diameters). Although sometimes called "Orris root," and so named in some of the trade returns, Costus must not be confounded with the rhizomes of *Iris*, which are also to be met with in India and other oriental countries, and are the true "Orris root," though perhaps the produce of a species of *Iris* differing from *Iris florentina*.

In 1859 a communication was made to the Agri-Horticultural Society of India of two roots, one called *Koot* and the other *Thooth*. They were from the hills of that part of the Kangra district which borders on Chumba. The "Koot" was identified as the "Costus," the subject of this communication; and the other was believed by Dr. Thomson to be the root of *Salvia lanata*, which was said to be common also in Kashmir, where it is used to adulterate "Kut."

Subsequently Mr. H. Cope of Umritsur contributed some remarks to the same society on the adulterations of this drug. "This adulteration," he says, "is now (1860) carried to such a pitch with the assistance not only of the Toot (which so closely resembles the genuine article in every respect but its qualites, that it is difficult to distinguish the one from the other after admixture, which imparts to the false the odour of the true drug) but with other foreign substances, of which cow-dung is one, that I have ascertained as a fact that the more unscrupulous dealers use some 20 seers of the Koot to flavour 100 seers of trash. When *Toot* was first found useful as an admixture, it was sold at Rs. 1—8 per maund; being now the main ingredient of the Putchuk of commerce, it has risen to Rs. 4—8. I am told that two other substances resembling the genuine article in exterior appearance have been ascertained to serve as ingredients in the mixture sent to Calcutta and Bombay for exportation to China, under the name of *Putchuk*. They are a root called *Chog*, brought from the hills, which is generally reported to be a deleterious drug; and *Nirbisi*, the root of a species of *Aconitum*, probably a virulent poison.

Bibliography.—The following are some of the works which may be consulted on this subject. Rhases 'Cont.,' i. ult. i. 236; 'Avicenna,' ii. 2, 161; 'Serapion,' c. 318; Pliny 'Hist. Nat.,' xii. c. 24; 'Columella,' xii. 20; 'Propertius,' iv. 6, 5; 'Lucan,' ix. 917; Horace, 'Carm.,' iii. 1, 44; Ovid 'Met.,' x. 368; 'Dioscorides,' lib. i. c. xv.; 'Paulus Ægineta' (Syd. Soc.), iii., p. 190; 'Pharmacopœia of India,' p. 127; Falconer in 'Linn. Trans.,' xix., p. 23; Irvine 'Med. Topog. Ajmeer,' p. 107, 142; Royle 'Illustrations,' pp. 360; Guibourt 'Hist. Drog.,' iii., 28; Royle 'Antiq. Hind. Med.,' p. 699; Ainslie 'Mat. Med.,' ii., 166; Birdwood 'Bomb. Prod.,' p. 48; O'Shaughnessy 'Beng. Disp., p. 652; *Pharm. Journ.*, ser. 1, vol. 1, p. 575; Stewart s 'Punjab Plants,' p. 122; Porter Smith's 'Chinese Materia Medica;' Powell's 'Punj. Prod.,' p. 356; *Journ. Agri. Hort. Soc. India* (1859), vol. xi., part 1, p. lxxvi (1860); vol. xi., part iii., pp. iii.; 'Abu Mansur Mowafik' (edit. Seligmann) pars. ii., p. 66; Simmonds 'Comm. Prod.,' p. 438; Hanbury 'Chin. Mat. Med.,' No. 101; Honigberger 'East,' p. 262; Pomet 'Hist. of Drugs' (1737), p. 32.

BUTYL-CHLORAL HYDRATE.

The following are the concluding paragraphs of a paper on butyl-chloral hydrate—otherwise known as croton-chloral hydrate—which appeared in the *Medical Examiner* for June 28.

"Gathering up our own experience, and comparing it with that of others, we are inclined to think butyl-chloral hydrate will be of value when we learn accurately to discriminate the cases to which it is most adapted. We have seen some remarkable successes. Neuralgia and toothache have both disappeared after a dose or two of the remedy as if "by magic," as the victims said. On the other hand, we have been completely disappointed in similar cases in which it was given in the same way. For one case of toothache, due to an exposed nerve, we have carried it as far as seemed right, and produced its full constitutional effect without obtaining the slighest relief. We have known it give immediate relief in exactly similar cases. It appears to us that a nerve recently irritated is not to be appeased by a moderate dose of such a drug, though other conditions giving rise to similar pain may more readily yield to its influence. For the intense pain set up by mechanical irritation or chemical injury there yet remains the question of its local use, and here we look to dentists to give us information. Some important facts have been recorded which should lead them to give it a fair trial. Thus Dr. Cleborne, of the U.S. Naval Hospital, Portsmouth, has lately employed a mixture of equal parts of the hydrate, crystallized carbolic acid and solid Japanese oil of peppermint as a plug in caries, and says it very speedily removed sensitiveness. Of course, here we have the effect of the carbolic acid to consider. This is a decided anæsthetic when applied locally, and so also oil of peppermint has a very ancient reputation for the same property. This experiment is therefore by no means conclusive, and it would be well to try the butyl-chloral hydrate pure. But as a remedy for toothache the compound recommended by Dr. Cleborne might soon be tried on a large scale. He recommended it to his dentist, who he says confirmed his opinion of its value, and pronounces it the best "obtunder" for use when stopping, as well as to remove soreness and pain after dental operations. In toothache from caries he advises that after the mouth has been washed with a weak solution of bicarbonate of soda in warm water, the cavity should be dried with cotton wool, and then a pledget of this soaked in the "obtunder" be gently introduced into the cavity and covered with fresh wool—either dry or soaked in styptic colloid. Further, he says that stopping may be effected without pain when it is not desirable to destroy the pulp with arsenic by the use of the remedy. This is the plan advised: a fine brooch armed with a pledget of wool soaked in the remedy is introduced into the cavity and retained in position by a second plug of wool. In from five to ten minutes the application is removed, and the excavation of the cavity proceeded with until it produces pain; then the operation is suspended, and a renewed application made. The process may, it is said, be repeated until the cavity is ready for the permanent stopping, and it is suggested that this may be introduced without causing any pain, and without destruction or injury of the pulp.

"We should feel considerable doubt as to the propriety of pushing its use thus far, but it certainly seems desirable that a fair trial should be given to any drug which promises to be unusually efficacious in relieving toothache or neuralgia; whether butyl-chloral hydrate alone, or in combination, is trustworthy for such a purpose might soon be determined, and so too it might easily be shown whether ordinary chloral possesses similar properties. It is well known that camphorated chloral—prepared by rubbing together equal parts of camphor and chloral hydrate—is useful for relieving the pain of toothache and neuralgia, when applied locally, and probably other combinations might be found equally or even more effectual.

"With regard to the internal administration of butyl-chloral it may, perhaps, be given in larger doses than the drug for which it is proposed as a substitute. It is said that as a hypnotic from twenty to forty-five grains may be administered at bed-time. For the purpose of producing sleep, however, we prefer ordinary chloral, unless under special circumstances, and then we should decidedly object to the larger doses mentioned. Probably when chloral is contra-indicated by heart disease it would be well to forego butyl-chloral also. In all cases it would be safer to give a smaller dose and repeat it than to charge the system with the full quantity at once. The effect of a small dose passes off frequently in about two hours, when it can be repeated if need be, with safety; or if no effect whatever were produced another dose could be given even earlier. An alcoholic solution is liable to undergo some change which is said to impair its anti-neuralgic power. This is probably true of all solutions, and we should therefore advise it in all cases to be freshly prepared. It is commonly given in syrup, but a good solution may be readily made with glycerine. The following mixture contains enough to supply at once, and is not likely to be dangerous:

℞. Butyl-chloral Hydrat. . . . . ʒss.
Glycerinæ . . . . ℥ss.
Aq. destil. ad . . . . ℥vj. M.

"Two tablespoonfuls of this, containing only five grains, can be repeated in half an hour two or three times in succession until the pain is relieved, and then less frequently. It should be still further diluted when taken, as the taste is very pungent. Some have recommended grain or two grain doses to be given, but we cannot report favourably of these small quantities; nor can we understand how those who advise large does as a hypnotic can expect insignificant ones to assuage the pain of tic. We prefer to avoid the use of massive doses on the one hand, or to trifle with pain on the other. It is better to trust to the local action than to minute doses internally for the relief of pain; while as a hypnotic butyl-chloral is not so effectual as chloral, which is accordingly in most cases to be preferred. But a combination of the two drugs sometimes induces sleep when either alone fails. If a few doses of butyl-chloral give no relief to pain it is seldom advisable to continue it."

FORMULÆ FOR NEW MEDICAMENTS ADOPTED BY THE PARIS PHARMACEUTICAL SOCIETY.

(*Continued from page* 28.)

Cataplasm of Fucus crispus.

A sheet of wadding, simply carded, about one metre square, is stretched upon a frame and a concentrated mucilaginous infusion of *Fucus crispus* is diffused over it. Above this is placed another sheet of wadding of the same dimensions, and this is struck lightly with a brush in order that the mucilage may penetrate the wadding equally throughout. The whole is then exposed to a moderately heated stove, and the mucilage losing its water of hydration returns gradually to the state of dry *Fucus*. When taken from the stove the cataplasm resembles a sheet of thick cotton, and notwithstanding the time it has been kept in a warm atmosphere it has not contracted the least odour.

When required for use it should be placed in a large plate and treated with nearly boiling water. The *Fucus* swells considerably, and in this state the wadding contains under the form of mucilage a large quantity of water saturated with the emollient principles of the plant.

Glycerates (*Glycérés*).

Glycerate of Subnitrate of Bismuth (*Glycéré de sous-nitrate de bismuth*).

Glycerate of Starch, 90 grams; Subnitrate of Bismuth, 10 grams. Mix carefully in the cold.

Glycerates of Lead Carbonate, Zinc Oxide, and Calomel are prepared in a similar way.

Laudanum Glycerate (*Glycéré laudanisé*).

Glycerate of Starch, 90 grams; Sydenham's Laudanum, 10 grams. Mix.

Glycerate of Lead Acetate is prepared in a similar way.

Glycerate of Rhatany (*Glycéré d'extrait de ratanhia*).

Glycerate of Starch, 90 grams; Extract of Rhatany, 10 grams. Dissolve the extract of rhatany in the smallest possible quantity of glycerine and add the glycerate of starch.

Tar Water (*Eau de Goudron*).

Choice Vegetable Tar, 5 grams; Pine Wood Sawdust, 10 grams; Distilled Water, 1000. Divide the tar by mixing it intimately with the sawdust; leave it in contact with the water 24 hours, stirring from time to time, and filter. Vegetable tar of good quality should be red-brown, transparent, free from resinous lumps, and derived either from Norway or the Landes department. If common water or water containing selenite be used the product will not keep and contracts an odour of sulphuretted hydrogen.

1000 grams of this water contains at least 1 gram of extract of tar.

Syrup of Tar (*Sirop de Goudron*).

Choice Vegetable Tar, 15 grams; Pine Wood Sawdust, 30 grams; Distilled Water, 1000 grams; Sugar, q. s. Divide the tar by mixing it with the sawdust. Pour it upon the water heated to 60° C., agitating occasionally. At the end of two hours filter upon the sugar, and in a closed vessel, by the aid of a water-bath, make a syrup in the proportion of 100 grams of liquid to 190 grams of sugar.

Iodized Cotton (*Cotton Iodé*).

Mix 25 grams of fine carded cotton, thoroughly dried in a stove, with 2 grams of finely powdered iodine so as to destribute the iodine powder as uniformly as possible throughout the cotton. Place the mixture in a litre flask, having a large mouth and a ground class stopper. Keep the flask with the mouth open for some minutes in nearly boiling water, so as to expel a portion of the air, then close it and tie down the stopper. The flask is then submitted for two hours at least to a temperature near 100°. The iodine vapourized condenses upon the cellulose. The flask ought not to be opened before it is quite cold, when all the iodine, about 8 per cent., will remain fixed upon the cotton.

This preparation should be kept in a well-closed bottle.

Iodoform (CHI_3).

Pure Carbonate of Potash, 2 parts; Iodine, 2 parts; Alcohol (84°), 5 parts; Distilled Water 15 parts. The potash, water, alcohol and the iodine reduced to powder are placed together in a flask. and the whole heated in a water-bath, until the decoloration of the liquid. Another $\frac{1}{2}$ part of iodine is then added, and heat again applied, and the addition of the metalloid is repeated until the liquid remains slightly brown coloured. It is then decolorized by the addition of one or two drops of caustic potash solution, and upon cooling crystals of iodoform are obtained. These are collected upon a filter, washed lightly with cold distilled water, then dried upon blotting paper and enclosed in well-stoppered bottles.

By evaporation of the mother liquor iodide of potassium is obtained.

Iodoform crystallizes in hexagonal lamellæ of a beautiful citron-yellow colour; it has a pungent saffron-like odour. It volatilizes without residue at a gentle heat; but a temperature of 120° partially decomposes it. It is almost insoluble in water; soluble in alcohol, and especially soluble in ether. It is almost entirely decomposed by potash. Pure iodoform ought not to dissolve in solutions of fixed salts. It should dissolve completely in boiling alcohol. Calcined strongly in contact with air it should not leave any residue.

Iodized Syrup of Horseradish (*Sirop de Raifort Iodé*).

Iodine, 1 gram; Alcohol (90°), 11 grams; Compound Syrup of Horseradish (Codex), 988 grams. Dissolve the iodine in the alcohol, filter, and mix the solution thoroughly with the syrup. After about 24 hours of contact at the ordinary temperature, the combination will be complete and the syrup will have recovered its original colour.

In this preparation the iodine is concealed from ordinary reagents. The syrup contains one-thousandth of its weight of iodine.

Iodotannic Syrup (*Sirop iodotannique*).

Iodine, 1 gram; Alcohol (90°), 11 grams; Syrup of Rhatany (Codex), 988 grams. Proceed as with Iodized Syrup of Horseradish.

If it be desired to obtain the preparation at once it will be sufficient to heat the mixture to 30° or 60° C.; the combination is quickly completed, and is indicated by the return of the original fine red colour of the syrup of rhatany.

This syrup contains one-thousandth of its weight of iodine.

Syrup of Iodide of Starch (*Sirop d'iodure d'amidon*)

Soluble Iodide of Starch, 10 grams; Distilled Water, 350 grams; White Sugar, coarsely powdered, 640 grams. Dissolve the iodide of starch in distilled water and filter. Use this liquor to dissolve the sugar with the aid of a very gentle heat.

20 grams of this syrup contain about 2 centigrams of iodine.

The soluble iodide of starch is prepared by dissolving 1 part of iodine in sufficient 90° alcohol, adding 9 parts of starch previously washed in water acidulated with nitric acid and air dried, and then drying the mixture in a water-bath at a moderate temperature. This product is triturated with sufficient distilled water to make a soft paste, which is heated in a flask by means of a water-bath until it becomes entirely soluble in water, which may be ascertained by removing a small quantity and suspending it in pure water.

Jaborandi (*Pilocarpus pennatifolius*).

The leaves and the cortical parts of this shrub are alone employed in medicine. They contain, besides pilocarpine, a peculiar essential oil composed principally of a carbide of hydrogen and various other substances as yet unstudied.

The leaves of Jaborandi are employed in medicine under the same forms and in the same doses as Coca leaves (see before, vol. vii., p. 1064).

Pilocarpine.

Exhaust the leaves or bark of Jaborandi with 80° alcohol, to which hydrochloric acid has been added in the proportion of 8 grams per litre; distil and evaporate to the consistence of an extract. Re-dissolve the extract with a small quantity of distilled water, and filter; treat with ammonia in slight excesss and a large quantity of chloroform. Distil off the chloroform, dissolve the residue in distilled water acidulated with hydrochloric acid, and filter. Treat afresh with chloroform and ammonia. The chloroformic solution is then shaken with water to which hydrochloric acid is added drop by drop up to the quantity sufficient to saturate the pilocarpine. The foreign matters remain in the chloroform, and upon evaporation of the aqueous liquid the hydrochlorate is obtained well crystallized in long needles radiating from a common centre. The hydrochlorate, dissolved in distilled water and treated with ammonia and chloroform, yields the pilocarpine upon evaporation of the chloroform solution.

Pilocarpine appears under the form of a soft viscous substance; it is slightly soluble in water and very soluble in alcohol, ether and chloroform. It presents all the chemical characters of an alkaloid and rotates the plane of polarized light strongly to the right.

Lithium Benzoate (*Benzoate de Lithine*). $LC_7H_5O_2,H_2O$.

Benzoic Acid, 122 grams; Lithium Carbonate, 37 grams. Suspend the benzoic acid in 10 parts of water, add the lithium carbonate, and heat. Solution takes place with effervescence, and upon evaporation handsome, much flattened, more or less elongated prismatic crystals are obtained.

Lithium benzoate is very soluble in water. One gram of the salt calcined, and then treated with slight excess of sulphuric acid, and heated to redness, should give 0·376 gram of lithium sulphate.

Lithium Bromide (*Bromure de lithium*). LBr.

Bromine 80 grams; Iron Filings, q.s.; Distilled Water, 300 grams; Lithium Carbonate, 38 grams. Prepare iron bromide as before indicated (see p. 26), filter, and add the lithium carbonate to the filtrate whilst still hot; heat toward the close of the operation to complete the double decomposition. The liquor ought to be feebly alkaline. Filter to separate the precipitated carbonate of iron, and wash the precipitate with q.s. of distilled water, evaporate and run into flakes, which should afterwards be enclosed in well-dried flasks.

One gram of lithium bromide is entirely precipitated by 1·95 gram of silver nitrate.

Lithium Carbonate (*Carbonate de Lithine*). L_2CO_3.

Lithium carbonate is prepared on the large scale from lepidolite. It is a white powder soluble in 100 parts of cold water. Treated with dilute hydrochloric acid it dissolves with effervescence, and the solution evaporated to dryness leaves a residue which, dissolved in alcohol, communicates to flame a beautiful purple colour. The chloride dissolved in water gives a precipitate with sodium phosphate.

One gram of this salt treated with sulphuric acid, then evaporated and heated to redness, should give 1·48 gram of lithium sulphate, which, re-dissolved in distilled water, is not precipitated by calcium oxalate or lime water.

Effervescent Salts.

Effervescent Lithium Carbonate.

Citric Acid, 40 grams; Sodium Bicarbonate, 50 grams; Lithium Carbonate, 10 grams. Mix the powders, and place them in a flat-bottomed vessel having a large surface; heat to about 100°C., stirring the powder continually until it takes the granular form; then by means of appropriate sieves obtain granules of suitable and uniform size, and preserve the preparation in well-closed bottles.

Effervescent Citrate of Lithium, Effervescent Citrate of Iron, Effervescent Potassio-Tartrate of Iron, etc., may be prepared in a similar manner.

Lithium Citrate (*Citrate de Lithine*). $L_3C_6H_5O_7,2\,H_2O$.

Citric Acid, 186 parts; Lithium Carbonate, 100 parts. Dissolve the citric acid in ten times its weight of water, saturate while boiling with lithium carbonate, and evaporate with a gentle heat. Handsome elongated prismatic crystals are thus obtained, containing two equivalents of water.

The citrate dried at 100° C. retains half a molecule of water. To obtain it anhydrous it is necessary to raise the temperature to 115°C. This salt is soluble in 25 parts of cold water.

One gram of crystallized lithium citrate calcined, and the residue treated with sulphuric acid and heated to redness, should yield 0·223 gram of lithium sulphate.

Lithium Iodide (*Iodure de lithium*). LI.

Iodine, 127 grams; Iron Filings, 35 grams; Lithium Carbonate, 38 grams; Distilled Water, 300 grams. Prepare a solution of iodide of iron with the whole of the distilled water; filter, add the lithium carbonate to the liquid while still hot, and raise the temperature to boiling to complete the double decomposition; the liquor ought to be slightly alkaline. Filter; wash the precipitate, evaporate, and run the melted lithium iodide into flakes.

Lithium iodide is white, and very soluble in water and alcohol. One gram, dry and pure, is entirely precipitated by 1·27 gram of silver nitrate.

Magnesium Lactate (*Lactate de Magnésie*).
$MgC_3H_5O_3,3\,H_2O$.

Dilute Lactic Acid with ten times its weight of water, and saturate while boiling with Magnesium Carbonate. Filter and leave to evaporate at a moderate temperature.

Magnesium lactate is white, and crystallizes in small flat elongated prisms. It is soluble in about 20 parts of cold water, much more soluble in boiling water, and insoluble in alcohol.

Magnesium Sulphite (*Sulfite de Magnésie*).

$MgSO_3, 3\,H_2O$.

This salt may be obtained by double decomposition between magnesium sulphate and neutral sodium sulphite; but it is preferable to prepare it by passing a current of sulphurous acid gas into water holding magnesium carbonate in suspension. When effervescence is no longer produced, and when the liquor after being strongly agitated retains the odour of sulphurous acid, the current of gas is suspended. The precipitate is collected on a filter or cloth, slightly washed, then pressed and dried rapidly at a very moderate temperature. It should be preserved sheltered from the air.

The salt is white, with an earthy flavour and an after-taste of sulphurous acid. It is soluble in 20 parts of water. It dissolves more easily in a solution of sulphurous acid, which deposits it on evaporation in transparent prismatic crystals. Exposed to the air it absorbs oxygen rather rapidly.

100 c.c. of a solution containing 0·79 gram per litre of pure magnesium sulphite, to which starch paste is added, absorbs 10 c.c. of a solution containing 12·7 grams of iodine to the litre before giving a persistent blue colour.

Extract of Malt.

Malt dried at 30° C., the germ of which equals two-thirds the length of the grain, is ground in a mill, treated with two parts of water at the ordinary temperature, stirring occasionally, and after five or six hours' contact, strained and pressed. The product is filtered and evaporated in vessels exposing a large surface, at a temperature not exceeding 45° C.

Bibasic Mercurous Nitrate (*Azotate mercureux bibasque* or *Turbith nitreux*). $Hg(NO_3)_2, Hg_2O + H_2O$.

Crystallized Mercurous Nitrate (Codex), 1 part; Boiling Water, 10 parts. Powder the salt as finely as possible and suspend it in the boiling water, shaking it for some time. When the powder has become greenish yellow allow it to deposit at the bottom of the vessel; decant the supernatant liquor and wash the deposit several times with cold water. Finally dry it and preserve it sheltered from light.

Nitrous turbith is pulverulent, pale greenish yellow, insoluble in water, but completely soluble in pure nitric acid. The powder is blackened by potash. When calcined strongly it gives off rutilant fumes, the mercury condenses in metallic gobules, and no fixed residue is left.

Mustard Paper (*Papier moutarde*).

The preparation of sinapisms in leaves demands two conditions for its success: (1) the employment of a mustard deprived of all fatty matter; (2) the use an agglutinant liquid that contains no water, alcohol, resin, or fatty matter.

The mustard powder is separated from the fatty matter it contains by washing with carbon bisulphide or petroleum spirit. The agglutinant liquid consists of a solution of 4 to 5 per cent. of caoutchouc in a mixture of carbon bisulphide and petroleum spirit. A uniform layer of the viscous solution is spread by means of an ordinary plaster spreading machine. As the sheet covered with the varnish issues from the machine a sieve containing mustard flour is shaken over it. The flour, retained by the viscosity of the fluid, remains fixed upon the paper after the vaporization of the volatile liquids by the heat of a stove. It will be understood that it is necessary to combine with a certain amount of precision the movements of the sieve and the progress of the sheet of paper. The leaf is afterwards cut into pieces of the size desired.

(*To be continued*).

NOTE ON GARDENIN.*

BY JOHN STENHOUSE, LL.D., F.R.S., AND CHARLES E. GROVES.

Gardenin was discovered by one of us (*Stenhouse, Phil. Trans.*, 1856, cxlvi., 155, and *Ann. Chem. Pharm.*, xcviii, 316) some twenty years ago in "dekamali gum," a resinous exudation from the *Gardenia lucida*, but the amount of gardenin obtained at that time was insufficient to make a satisfactory analysis, the quantity of resin operated on being but limited. About three years ago, however, we had a larger sample of the resin, enabling us to obtain a few grams of the gardenin in the pure state. The resin from the *Gardenia lucida* has been fully described both by Dymock (*Pharm. Journ.* [3], vii., 491), and by Flückiger (*ibid.*, p. 589), the latter of whom, moreover, extracted the gardenin and analysed it.

We found that the best method of obtaining the crude gardenin was to boil the resin with alcohol, filter the solution to separate the insoluble residue, consisting chiefly of small fragments of bark and wood, and allow it to cool. It then deposited almost the whole of the gardenin in slender, pale-yellow needles, which were collected and washed with cold spirit, to free them from the amorphous greenish-yellow resin, which forms by far the larger portion of dekamali gum. These needles, however, even after several crystallizations from alcohol, were found to be still impure, being contaminated with a colourless substance of low melting point, somewhat resembling a fat in appearance. After repeated trials in various ways, it was found that this impurity might be removed by means of light petroleum. A boiling saturated solution of the gardenin in alcohol was allowed to cool, and the almost pasty mass of crystals was agitated with light petroleum at a temperature of about 30°, the clear liquid poured off, and the residue again agitated with petroleum, repeating the operation several times. The gardenin was finally purified by alternate crystallization from hot benzene, in which it is readily soluble, and from alcohol.

When pure, gardenin forms brilliant deep yellow crystals, which melt at 163—164°. Dried at 100°, and burnt in a current of oxygen it gave the following results:—

I. ·249 gram of substance gave ·567 gram carbonic anhydride, and ·119 gram of water.

II. ·202 gram of substance gave ·457 gram carbonic anhydride, and ·102 gram of water.

		Theory.	I.	II.	Mean.	Fluckiger
C_5 . . .	60	61·86	62·12	61·70	61·91	59·47
H_5 . . .	5	5·16	5·31	5·60	5·45	6·71
O_2 . . .	32	32·98	——	——	——	——
	97	100·00				

Flückiger's numbers do not agree with these, but as the specimen he analysed had merely been purified by repeated crystallization from spirit, it is not impossible that it was contaminated with traces of the colourless fatty substance mentioned above. This is rendered very probable by the much lower melting point (155°) which he obtained.

It was stated in the earlier paper (Stenhouse, *loc. cit.*) that when gardenin is digested with concentrated nitric acid, it is rapidly decomposed, picric acid, but no oxalic acid being produced. On repeating the experiment, however, we found this to be incorrect: gardenin, when boiled with nitric acid, dissolves with evolution of nitrous fumes, forming a yellow solution, which, on evaporation, leaves a yellowish residue; this, however, on careful examination, proved to be quite free from trinitrophenol. It was noticed, in making this experiment, that at the moment the gardenin came in contact with the nitric acid, it assumed a brilliant crimson colour before dissolving. The attempts made to isolate the red substance thus

* From the *Journal of the Chemical Society*, May, 1877.

formed were ultimately successful: 1 part of gardenin was dissolved in about thirty times its weight of boiling glacial acetic acid, and after being rapidly cooled two parts parts of nitric acid of sp. gr. 1·45 were added to the clear solution. In a few seconds hair-like crimson needles began to form, very different in appearance from gardenin. At the expiration of five minutes, the mixture, which was kept cold, had solidified to a pulp of needles. It was then mixed with about 150 parts of cold water, and the gelatinous precipitate collected after it had stood a few minutes. The pasty red mass, after being well washed, was pressed into a cake and removed from the filter before drying, for it was found that if allowed to dry on the filter it adhered so firmly to the paper that it was very difficult to remove it. Gardenin yields nearly 90 per cent of its weight of this substance, which is insoluble in water and dilute acids, but readily soluble in alkaline solutions, and reprecipitated, on the addition of an acid. We have provisionally named it *gardenic acid.* It is free from nitrogen, and after being purified by boiling with spirit, in which it is but very slightly soluble, and crystallization from glacial acetic acid, it was found to melt at about 236°. If the nitric acid is allowed to act on the glacial acetic acid solution of gardenin for a considerable time, or on the gardenic acid itself, it becomes changed to an orange-coloured substance much more soluble in alcohol than in gardenic acid.

At present the amount of gardenin at our disposal is too small to permit a thorough examination of these new compounds, and other derivatives of gardenin. As they appear, however, to be of some interest, we have made arrangements to obtain a considerable quantity of dekamali gum from India, and hope ere long to be able to continue the investigation.

DIALYSED IRON.

BY ANDREW AND H. C. BLAIR.

This preparation has attracted the attention of many of the pharmacists and medical profession of Europe for some time past, and the experience resulting from its use is so satisfactory, peculiar and wonderful, that it is probably destined soon to become one of our most valued therapeutic agents in a large class of diseases where the ordinary iron preparations are objectionable. "With this preparation," says an author, "we are able now to avoid all inconveniences which arise from the employment of ordinary ferruginous preparations."

Our attention was called to it some months ago through correspondence with a customer residing abroad, who spoke so highly of it, and mentioned such peculiar and wonderful properties it possessed, that led us to inquire more particularly into it. Further correspondence stated that this party had taken it as a remedial agent for a protracted period without the least inconvenience or unpleasant effect, and while under treatment in this country for the same ailment, the ordinary iron preparations were prescribed, but could not be taken for any considerable time without experiencing the common trouble so frequently complained of—headache, constipation, etc. Being interested in the matter, we obtained from a prominent French chemist a formula by which he was in the habit of making it, which is in substance as follows:

Take 10 parts liq. ferri per. chlor. (Br. Ph.), precipitate by aqua ammoniæ and wash the precipitate thoroughly. Mix this with 12 parts of liq. ferri perchlor. (Br. Ph.), and place in a dialyser. The dialyser is placed in a suitable vessel with distilled water, the water under it renewed every 24 hours. The operation is continued until no trace of chlorine exists, at which time the preparation is found to be neutral. It usually takes from 12 to 15 days to complete the process.

The resulting preparation is, or should be, of a deep dark-red colour, and contains about 5 per cent. of the oxide of iron. As to the chemical condition of the iron in solution, M. Bravais, of Paris (who claims to produce the only genuine), says, "It consists of liquid peroxide of iron, *i. e.*, iron merely united with oxygen and water to the exclusion of all acids;" but it is, no doubt, in fact a neutral solution of an oxychloride of iron in a concentrated form, and the theory of its production is nothing new, and is very simple. The oxychloride (which is the substance retained in solution in the dialyser) is a colloidal substance. The chloride (which is the principal substance rejected, or washed out as it were) is a crystalloidal substance. These two substances—crystalloid and colloid—are separated by dialysis, the former from the latter by diffusion through a septum, such as parchment paper.

Other formulæ more recently have been suggested, differing somewhat from the above, and it has been the subject of no little discussion abroad as to the particular merits of the one or the other of these. By some it has been suggested to pursue the following formula: Take a given quantity of liq. ferri perchlor. (Br. Ph.), and precipitate by ammonia, wash well the precipitate, and mix with sufficient quantity of the same preparation of liq. ferri perchlor. to saturation, and dialyse. It is remarkable how large a proportion of this freshly precipitated sesquioxide of iron will be taken up or dissolved. For example, the precipitate obtained from one pint of our officinal liquor ferri chlor., representing 3 ounces and 6 drachms of dry oxide, is entirely taken up by about 5 fluid ounces of the same liquor. In the magma this precipitate seems a very great quantity, so bulky is it; and, as stated before, it is quite surprising to see it disappear into solution under the influence of so small a quantity of the liquor.

By following the above method, we have found that it shortened the process considerably. It became thoroughly dialysed in one week, while the other takes about twice that time.

Still another method has been suggested, namely, to take a given quantity of the liquor ferri chlor., and add aqua ammoniæ almost enough to produce the precipitate of the sesquioxide. When the precipitating point is reached the whole solution is placed in the dialyser. The chloride of ammonium is thus extracted from the solution, and the peroxide of iron, or oxychloride, retained.

If either of these processes were pursued carefully, we have found the same result to be reached. If the solution, after completion of the operation, should contain more than 5 per cent. of iron, it may be diluted with distilled water till it reaches that point. There are some dialysed irons in the market which we have examined, containing no more than from $3\frac{1}{2}$ to 4 per cent. When the preparation has become thoroughly dialysed, it is tasteless and neutral; the operation should then be discontinued, as by further dialysis the liquid is converted into a gelatinous condition.

We may say in closing, that the above formula furnishes an article precisely similar to the original Bravais' Dialyzed Iron, which we have imported and had ample opportunity for comparison. By manufacturing it in this country, it can be produced for about one-half the cost of the imported.

The manner of taking the pure concentrated dialysed iron is generally in drops, ranging from 15 to 50 daily, in divided doses, on sugar or in sugar and water; suitable vehicles can be used for administration without fear of decomposition. Being without taste and odour, compatible with syrup and alcohol, and communicating no taste to any suitable vehicle, it is easy to construct formulæ for elixir, syrup, etc.; a glycerite we find to be an excellent preparation.

These preparations, besides being more acceptable to the delicate palate, are perhaps preferable on account of the dose being brought up to the more popular measure of tea- and tablespoonful, and avoiding the necessity of the patient mixing them with any other liquid before taking.

* From the *American Journal of Pharmacy*, July, 1877.

The Pharmaceutical Journal.

SATURDAY, JULY 21, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE BRITISH PHARMACEUTICAL CONFERENCE.

IN a circular issued by the Local Committee of the Conference in respect to the meeting to be held in Plymouth on the 14th and 15th of next month, attention is called to the many "natural beauties of "scenery of hill, dale, and moorland heath" for which Devon is famous, and to the tin, copper and iron mines, and china clay works of Cornwall. Nor is this unwarranted. Plymouth Sound, perhaps the largest harbour in the world, with its famous breakwater; the beautifully wooded heights and grounds of Mount Edgcumbe, which most Englishmen have heard of if they have not seen; the Hamoaze, where the wooden, or rather iron, walls of Old England ride at anchor; and the river Tamar, which has been called the "English Rhine," and is crossed by BRUNEL's tubular suspension bridge, form a very tempting conglomeration of the natural and the artificial, which should not be without its influence on the decision of the pharmacist as to whether he will attend the coming meeting of his craft in the West. If his tastes lie in other directions, he may inspect the dockyard and the vast Government works of the victualling yard, the gun wharf and the Keyham factory, or the naval and military hospitals, or the fortifications by which three towns, and £100,000,000 worth of public property, are to be protected in the event of an attack by a foreign enemy.

Of course we do not doubt that the list of papers to be read, of which we were able to give an instalment last week, will be the most interesting of the preliminary notices. The Conference being established primarily for the encouragement of pharmaceutical research it is only natural that this should be so. But even the most stoically scientific pharmacist will not have failed to notice that the second object of the Conference, the promotion of friendly intercourse amongst those engaged in pharmacy, is not to be lost sight of, and that the members of the Local Committee have announced their intention to furnish the opportunity for this friendly intercourse by inviting the visitors to accompany them on an excursion, on Thursday, the 16th of August, the day following the meetings.

We understand that, as at present arranged, it is intended that this excursion shall include a trip up the river Tamar. Passing, on the way, through the Hamoaze, with its fighting ships of every class, Saltash will be reached, where the Cornwall Railway bridges the river in two enormous spans at a height that will permit the largest vessel to pass under with all her sails set. Next running past the mouth of the Tavy, with the beautifully wooded hills of Warleigh and Budshead crowning either side of the adjoining creek, and equally varied scenery on the opposite shore, Carr Green, with its tea gardens will be seen on the left, and soon after a large silver and lead mine on the right. A little further on, on the same side, are the celebrated cherry gardens, and then, beyond a sharp bend of the river, Pentillie Castle, the picturesque seat of Colonel CORYTON, comes into view, perched in the midst of magnificent woods, on an eminence commanding a grand view of river scenery. From this point the river begins to narrow, and here and there may be seen on its bank the solemn-looking heron waiting for its finny prey.

The next place to be visited is Cothele, a granite built mansion of the Earl of MOUNT EDGCUMBE, dating from the time of HENRY VII. Here, besides enjoying the rich woods sloping down to the river, visitors possessing antiquarian tastes may revel in a magnificent accumulation within the mansion of ancient tapestry, ancient armour, ancient carvings, and dragon china. Then, still winding between the leafy banks, the village of Calstock, and Harewood House, the scene of the tragedy of 'Elfrida,' will come into view, and, further on, Morwell Ham Quay, where a canal brings the Tavy again into communication with the Tamar. Lastly, the Morwell rocks, near the Weir Head, and the limit and crown of the trip in this direction, will be reached. On the return, passing through Plymouth Sound, a glance will be given at the Breakwater and then a landing will be made at Mount Edgcumbe, where the wonderfully beautiful park and gardens will, by the kindness of the noble owner, be thrown open to the Members of the Conference. If the day be fine, probably at its close there will be few of the visitors disposed to question the taste of the Spanish grandee who is said to have selected this seat as his share of the spoil that did not fall to the lot of the Invincible Armada.

To turn now to the more serious portion of the business of the Conference it will be seen that we are enabled to announce the titles of six other papers beyond those published last week. With this bill of fare, and the certainty of its being supplemented by something substantial from the veteran President, Professor REDWOOD, no great prophetic power is needed to predict a successful meeting.

One word in conclusion. Perhaps the most important contribution to the enjoyment of a holiday is being lodged and fed well. It is thought probable that the large number of visitors to Plymouth next month will severely tax its powers in this respect. We have failed hitherto to get any very definite information upon this subject, either from the local Conference executive or that of the British Association. We understand, however, that if Members of the Conference desiring hotel accommodation will communicate with the Local Secretary, Mr. R. J. CLARK, 77, Old Town Street, Plymouth, he will attend to each application as it comes to hand. It is urged that such applications should be made at as early a date as possible. But the issue of a list of the hotels and their tariffs would much facilitate arrangements and probably relieve the Local Secretaries from a deal of unnecessary labour.

AN ERROR IN THE PHARMACOPŒIA.

IN the reprint of the *British Pharmacopœia* recently issued, an error has crept into the text on p. 180 that was not present in previous issues. In the formula for Liquor Arsenicalis, the quantity of Compound Tincture of Lavender to be taken should be "5 fluid drachms," and *not* "5 *fluid ounces*" as there printed. This correction becomes the more necessary, because our contemporary, the *Medical Press and Circular*, in calling attention to the error, has itself erroneously reversed the conditions and given "5 fluid ounces" as the correct quantity.

THE ROYAL GARDENS AT KEW.

SIR JOSEPH HOOKER'S Report on the Progress and Condition of the Royal Gardens at Kew during the year 1876, from which we quoted some extracts last week, contains also other very interesting details. In the first place the number of persons visiting the gardens shows a decrease as compared with the previous year, the figures being 596,865 against 678,002. On the 7th of August, however (which was Bank Holiday) the gardens were visited by 64,163 persons, the largest number ever recorded for one day. The visitors themselves appear, in the Director's opinion, to have shown indications of degeneracy, their appetite for quiet study having been somewhat impaired by previously feasting on the frivolities of Kew Green.

During the year there was received from 244 contributors living in all parts of the globe no less than 2,487 packets of seeds, 2,129 stove and greenhouse plants, 1,962 herbaceous plants, and 1,942 trees and shrubs. On the other hand there have been distributed 3,354 packets of seeds, 11,770 stove and greenhouse plants, 1,179 herbaceous plants, and 7,480 trees and shrubs to 164 recipients.

Those of our readers who have not been able to understand the enhanced price of coffee during recent years may find an explanation here. After reading the description of the leaf blight of Ceylon and Southern India, the coffee fly of the Antilles, the "borer," the "coffee bug," the "canker," and other vague diseases attributable to climatic causes, the wonder will be that the plant survives anywhere. In fact, in Dominica, where once the finest West India coffee was produced, the cultivation is now abandoned, and British Guiana, once the home of the "Berbice" coffee, now imports the berry. At present it is somewhat undecided how far the Liberian coffee plant, from which so much was expected, will be able to withstand the leaf blight.

With respect to the scourges from which economic plants suffer so much, Sir J. D. HOOKER remarks, that the conditions under which they are grown are extremely favourable for the rapid extension and development of parasitic plants and insects. When these have only native plants in small quantities to prey upon they pass unnoticed, and their appearance on a large scale is one of the penalties man must expect to pay for such an enormous disturbance of natural conditions as is implied in replacing a tropical forest of the most varied and mixed vegetation by a plantation of a single economic plant.

Considerable efforts are being put forth to secure the acclimatization of plants producing good varieties of india rubber in countries having suitable climates. Plants of *Hevea brasiliensis* and *Castilloa elastica* have been distributed to Ceylon, West Coast of Africa, Burmah, Jamaica, Java, the West Indies, etc. But at present our knowledge of the india-rubber producing plants is very imperfect; whilst as to the botanical history of the plants yielding the commercial varieties of gutta percha literally nothing is known, though there is reason to believe that they are very local and restricted in their geographical occurrence.

Another interesting point in these bellicose times is, that the large consumption of dogwood (*Rhamnus Frangula*) in the preparation of charcoal for gunpowder has produced a scarcity, and supplies of this material are now drawn from Germany. The use of the hornbeam (*Carpinus Betulus*) as a substitute has in consequence been proposed.

There are many other points of interest in this little pamphlet, but we must content ourselves with adding that the estimated number of specimens in the Herbarium is considerably over a million, and it is claimed that the collection of economic plants is now probably one of the most complete series of medicinal and useful plants ever brought together.

THE CONFERENCE PAPERS.

THE following titles of papers have been received in addition to those published last week:—

17. An Examination of Water from the Mineral Districts lying between Plymouth and Penzance. Dr. S. T. Rowe.
18. Proximate Principles of the *Narcissus Pseudo-narcissus*. Mr. A. W. Gerrard.
19. The Alkaloids of Japanese Aconite. Dr. Paul, F.C.S., and C. T. Kingzett, F.C.S.
20. Preserved Foods and Copper. Dr. Paul, F.C.S., and C. T. Kingzett, F.C.S.
21. Analyses of Preserved Carrots, Potatoes, Cabbage, and Mixed Vegetables. Professor Attfield.
22. Scammony Root. C. T. Kingzett, F.C.S.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

THE Annual General Meeting of the above Association will be held at 17, Bloomsbury Square, on Thursday evening, July 26th, at eight o'clock; Professor ATTFIELD, President, in the chair.

Transactions of the Pharmaceutical Society.

PRELIMINARY EXAMINATION.

At a meeting of the Board of Examiners for England and Wales, held in London on Wednesday, July 18th, 1877, the Report of the College of Preceptors on the Examination held on July 2nd was received.

Two hundred and fifty-one candidates had presented themselves for examination, of whom *one hundred and twelve* had failed. The following *one hundred and thirty-nine* passed, and the Registrar was authorized to place their names upon the Register of Apprentices or Students:—

(Arranged alphabetically).

Addis, Thomas Joseph............Bath.
Atkinson, Richard....................Penrith.
Bailey, John Streets...............Nottingham.
Batchelor, Frederick James......Swansea.
Beaumont, Edmund ....Wath-upon-Dearne.
Beaven, Baron Bruce ....Newport, I. of W.
Bell, Henry ....Ambleside.
Bennett, Frederick Birtwell ...Whitehaven.
Bennett, Joseph John ....Southsea.
Borkwood, Edward Turner......Boston.
Bowman, William Powell ......Brixton.
Brooks, John.........................Manchester.
Brown, Alexander...................Motherwell.
Brown, James ....Halifax.
Brownlee, George...... ....Edinburgh.
Burnett, Joseph Fearon.........Hyde, Cheshire.
Caffyn, Ernest John...............Crawley, Sussex.
Campbell, Hugh ....Glasgow.
Capper, Henry ....Liverpool.
Challans, John William ....Spilsby.
Clarke, Henry Robert Stanhope Malvern.
Clay, Charles.........................Clay Cross.
Clayton, John ....Scorton.
Clowes, William Cubitt ....Attleborough.
Cole, William ....West Cowes.
Cook, John Webster... ....Chapel-en-le-Frith.
Cowie, George ... .Glasgow.
Cowper, Charles Frederick......Wakefield.
Cox, Robert ....Bolton.
Cross, Charles H. ....Lancaster.
Currie, William Little............Glasgow.
Damant, Arthur Alfred ....Stowmarket.
Davies, Thomas Louis Kenrick Llandudno.
Davies, William ....Llantrisant.
Day, Arthur Joseph................Maidstone.
Desborough, James George, jun. Stamford.
Dickie, John ....Whitehaven.
Dickson, John ....Dumfries.
Dodds, Benjamin Bellamy ......Upper Clapton.
Edwards, Rees William ... .Brecon.
Evans, John Robert.................Carnarvon.
Evans, Robert Frederic ....Manchester.
Farman, Bartholomew Robert...Norwich.
Fenwick, John Clarke.............Bishopwearmouth.
Fisher, Henry ....Bingham.
Ford, William Crossley ....Dudley.
Fraser, James ....Edinburgh.
Gabbert, Thomas Martindale...Ulverston.
Gifford, Ebenezer ....Cambridge.
Gill, Reginald ....Yeovil.
Goss, Sidney Francis ....Plymouth.
Gott, Alfred Thomas ....Bradford.
Gowans, John Bruce ....Perth.
Graham, George Leslie ....Maidstone.
Greaves, William Thomas ......Nottingham.
Greenall, Thomas Holdsworth Ashton.
Greig, David..........................Arbroath.
Gribble, Edmund Arthur.........Stockwell.
Griffiths, David......................St. Davids.
Harris, William Thomas ... .Merthyr Tydvil.
Harrison, Henry Haseldine......Pickering.
Hatton, Frederick William......London.
Hayward, Luther....................London.
Headdey, Hervey Parry ....Oxford.
Hirst, Herbert Nelson............Bradford.
Hornblower, Joshua Thomas ...Birmingham.
Hutchins, Edward Coxhead ...Bath.
Hutton, William ....Portobello.
Jackson, George Granger ......Buxton.
Jeavons, Joseph ....Bradmore.
Jones, Penrhyn Vaughan ......Kirton.
Jubb, Robert..........................Howden.
Keene, Frederic John ....Oldbury.
Kett, George Robert ....London.
Keys, William Hall ....Birmingham.
Laing, Alexander ....Kelso.
Langton, William Crowder. Epworth-by-Rotherham.
Lawrence, Matthew Scott ......Stapleton.
Ley, David ....Alnwick.
McInroy, James ....Edinburgh.
MacManus, Josephine............Berkswell Rectory.
Mallinson, Joseph..................Wigton.
Marsh, Edward......................Luton.
Meacham, Vincent Whittenbury. Ledbury.
Mead, Theophilus William ......Yeovil.
Miller, John Wilson ....Perth.
Miller, Wm. Philip Faulkner...Folkestone.
Milnthorp, Joseph ....Altofts.
Morris, John Jones ....Cardigan.
Mowat, John Watt ... .Coatbridge.
Neale, George ....Spilsby.
Oliver, Frederick Josiah ....Tunbridge Wells.
Owen, Robert Garonwy ....Ruthin.
Painter, William, jun. ....Broadstairs.
Parker, Charles......................Lancaster.
Paterson, Walter ....Aberdeen.
Perry, Arthur William ....Birmingham.
Pidduck, William Joseph ......Southport.
Porter, Samuel Edward ....Southery.
Powell, Francis Edward ....Camden Road.
Prentice, Frank ....Ipswich.
Pringle, George......................Pathhead.
Procter, Henry Raithby ....Boston.
Prosser, Frank Henry ....Birmingham.
Rainey, James Jarvis ....Spilsby.
Rawes, William......................Hulme.
Rees, John ....Aberystwith.
Reid, Robert..........................Aberdeen.
Reynolds, Richard Freshfield...Leeds.
Richards, Benjamin ....St. Dogmells.
Ripley, Edward ....Cambridge.
Robertson, George ....Portsoy.
Roe, Robert ....Scotforth.
Schofield, Frederick Elston..... Morpeth.
Sergeant, Furlow Ross ....Goxhill.
Shackleton, Thomas................Accrington.
Slicer, Walter ....Bingley.
Stedman, Frank William ......Ashford, Kent.
Taylor, John Cleasby ....Kendal.
Thistleton, Hugh ....Preston.
Thomas, Benjamin ....New Inn.
Thompson, Charles Letchford...London.
Thomson, Ernest Andrew ......Plymouth.
Thomson, George ....Dumfries.
Turnbull, William S. ....Edinburgh.
Walshan, Richard Carnelly ...Wakefield.
Watts, George William ....Clapham.
Wheldon, James Alfred ....Darlington.
White, Henry Lancaster.........Pimlico.
White, Herbert William.........Manningham.
Whitelaw, Robert...................Bonhill.
Whitwam, Joe ....Leeds.
Wilding, George James ....Preston.
Wilkins, Walter Sidney ....Wimbledon.
Williams, John Harris ....Cardigan.
Willis, William......................Chadlington.

Wood, James Arthur ....Barnsley.
Wyatt, Samuel.....................Brimscombe.
Yeatman, Frederick James......London.

The following is a list of the Centres at which the examination was held, showing the number of candidates examined at each Centre, and the result:—

	Candidates. Exa-mined.	Passed.	Failed.		Candidates. Exa-mined.	Passed.	Failed.
Aberdeen	5	3	2	Hull	4	3	1
Aberystwith......	4	1	3	Leamington	1	1	0
Barnstaple	1	0	1	Leeds...............	16	9	7
Berwick-on-Tweed	1	0	1	Leicester	3	0	3
				Lincoln............	3	0	3
Birmingham......	11	7	4	Liverpool	6	3	3
Boston	7	6	1	London.............	35	16	19
Brighton	1	1	0	Lynn................	1	1	0
Bristol	5	4	1	Manchester	15	8	7
Cambridge	3	1	2	Newcastle-on-T.	4	3	1
Canterbury	4	4	0	Norwich	6	3	3
Cardiff	6	3	3	Nottingham......	6	3	3
Cardigan	2	2	0	Oxford	3	2	1
Carlisle............	7	6	1	Perth................	3	2	1
Carmarthen	5	1	4	Peterborough ...	1	2	3
Carnarvon	4	2	2	Plymouth.........	4	2	2
Cheltenham	1	0	1	Portsmouth	3	1	2
Chester............	6	1	5	Preston............	9	6	3
Colchester	2	1	1	Reading	1	0	1
Darlington	3	1	2	Salisbury	2	0	2
Doncaster.........	3	3	0	Sheffield	2	1	1
Dorchester	1	1	0	Shrewsbury	1	0	1
Douglas, I. of W.	1	0	1	Southampton ...	3	2	1
Dumfries	3	2	1	Swansea	3	2	1
Dundee	2	1	1	Taunton	1	1	0
Edinburgh	12	7	5	Truro	1	0	1
Exeter	1	1	0	Worcester	1	1	0
Glasgow	7	6	1	York...............	1	1	0
Hereford	2	2	0				

The Questions for Examination were as follows:—

First or Preliminary Examination.

July 2*nd*, 1877.

(*Time Allowed: Three hours for the three subjects.*)

I. LATIN.

1. Translate into English:—Interim quotidie Caesar Haeduos frumentum, quod essent publice polliciti, flagitare. Nam propter frigora, quod Gallia sub septentrionibus, ut ante dictum est, posita est, non modo frumenta, in agris matura non erant, sed ne pabuli quidem satis magna copia suppetebat; eo autem frumento, quod flumine Arare navibus subvexerat, propterea uti minus poterat, quod iter ab Arare Helvetii averterant, a quibus discedere nolebat. Diem ex die ducere Haedui; conferri, comportari, adesse, dicere.

2. Decline in the singular and plural *frigora, agris, copia, iter*. Explain the cases of *pabuli, frumento, flumine*.

3. Select from the above passage, and arrange in three columns:—(*a*) the pronouns, with their cases; (*b*) the adverbs; (*c*) the prepositions, and the cases governed by them.

4. Give the present, perfect, infinitive, and supine of *flagitare, subvexerat, averterant, ducere, dicere*; and the present of *polliciti, posita, poterat*.

5. How are expressions denoting *at, in*, or *on a place*, usually rendered in Latin? Write in Latin, if you can:—*In the midst of the city; in the morning; to protract from day to day*.

II. ARITHMETIC.

(The working of these questions, as well as the answers, must be written out in full.)

6. Multiply 574689 by 354; divide the product by 177, and express the result in *words*.

7. Find the value of $\frac{4\frac{4}{15} \text{ of } 2\frac{5}{8}}{5\frac{1}{5}-4\frac{1}{2}}$ and reduce 3*s*. $3\frac{3}{4}$*d*. to the decimal of £1 6*s*. 6*d*.

8. If 8 men earn £9 wages for 5 days' work, how much would 32 men earn for 24 days' work, at the same rate?

9. What is the basis of the Metric system? Reduce 12 kilog. 5 gr. to decigrammes, and prove the accuracy of your result.

III. ENGLISH.

10. State the rules for the formation of the plurals of nouns, giving *one* example only of each rule; and convert the following adjectives into their corresponding adverbs:—*first, good, hopeless, pretty*.

11. Give the past tense and past participle of the verbs *begin, throw, lie, lay*; and the present infinitives of *brought, flung, shorn, stricken, frozen*.

12. Parse the following:—

"He spoke of love, such love as spirits feel,
In worlds whose course is equable and pure."

13. Write a short life, in the order of the chief incidents, of Cardinal Wolsey, Admiral Nelson, *or* Mary Queen of Scots (*one only*); *or* an account of a visit to an Aquarium, *or* an outline of Dr. Schliemann's recent excavations and discoveries in Asia Minor.

EXAMINATIONS IN EDINBURGH.

July 12*th*, 1877.

Present—Messrs, Ainslie, Borland, Buchanan, Kemp, Kinninmont, Stephenson, and Young.

Professor Maclagan was present on behalf of the Privy Council.

MAJOR EXAMINATION.

Three candidates were examined. *One* failed. The following *two* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Clark, William Inglis ....Edinburgh.
Dick, Robert Gibson ....Edinburgh.

MINOR EXAMINATION.

Nine candidates were examined. *Two* failed. The following *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Blacklock, Philip Walton ......Brighton.
Boa, Peter.. ....Stranraer.
Cook, Frank.........................Herne Hill.
Curle, David.........................Partick.
Dodge, William ....Marple.
Fisher, John Hutchinson.........Edinburgh.
Warburton, Walter ....Middlesborough.

July 13*th*, 1877.

Present—Messrs. Ainslie, Buchanan, Kemp, Kinninmont, Stephenson, and Young.

MINOR EXAMINATION.

Ten candidates were examined. *Three* failed. The following *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bruce, William Balfour ....Kirkwall.
Nicholson, John Hastie ....Moffat.
Ogilvie, William Ogilvie.........Arbroath.
Pattinson, William ....Hexham.
Starkey, George Thomas.... ....Stratford-on-Avon.
Tipper, Jonathan Edward ......Evesham.
Walker, James ....Auchmull.

MODIFIED EXAMINATION.

One candidate was examined, but failed to pass.

PRELIMINARY EXAMINATION.

The undermentioned certificate was received in lieu of the Society's Examination.

Certificate of the Royal Colleges of Physicians and Surgeons of Edinburgh.

White, James ....Edinburgh.

Provincial Transactions.

CHEMISTS AND DRUGGISTS' TRADE ASSOCIATION.

Law Committee Meetings held at the office of the Association, 23, Burlington Chambers, New Street, Birmingham, on July 13th, 1877, at 1 p.m. The President in the chair.

Present: Messrs. Barclay, Churchill, Hampson, Holdsworth, and the Solicitor of the Association. The minutes of the previous meeting of this Committee were read and approved.

The Secretary stated that in compliance with a resolution passed by the Executive Committee, he had collected evidence of several cases of infringements of the Pharmacy Act, 1868, and forwarded particulars of the same to the Secretary and Registrar of the Pharmaceutical Society.

The following letters were then read:—

"Chemists and Druggists' Trade Association,
"23, Burlington Chambers,
"New Street, Birmingham.
"30th June, 1877.

"The Secretary and Registrar,
"Pharmaceutical Society of Great Britain,
"17, Bloomsbury Square,
"London, W.C.

"Dear Sir,

"Herewith please find particulars of thirteen cases of illegal trading under the Pharmacy Act, 1868, which kindly submit to the Council of your Society at their next meeting.

"In the first twelve cases, I made purchases of the poisons named within the last twelve days, and the parcels still remain in my possession.

"You will doubtless remember that in the case of L———, No. 4 on the sheets, I forwarded you on Nov. 27th last, particulars of a previous purchase of poison I had made from this person.

"I am, dear sir,
"Yours faithfully,
"W. F. Haydon,
"Secretary."

"Pharmaceutical Society of Great Britain,
"17, Bloomsbury Square, London, W.C.
"5th July, 1877.

"The Secretary,
"Chemists and Druggists' Trade Association,
"23, Burlington Chambers,
"New Street,
"Birmingham.

"Dear Sir,

"Your letter of the 30th ult., with particulars of thirteen cases of alleged infringement of the provisions of the Pharmacy Act, 1868, was laid before the Council at its meeting yesterday.

"In the case of C——— a prosecution has been ordered.

"In each of the other cases, with the exception of L——— (with whom we are already in correspondence), a letter will be sent giving notice that if the infringing of the provisions of the Act of Parliament be not discontinued forthwith, legal proceedings will be taken without further notice.

"I am,
"Yours obediently,
"Elias Bremridge,
"Registrar."

Some considerable discussion then took place, when it was moved by the President, seconded by Mr. Holdsworth, and unanimously resolved:—"That this Committee regrets the action which the Council of the Pharmaceutical Society has thought best to adopt in reference to the cases of illegal trading, evidence of which has been supplied by this Association, particularly the resolution of the Council, by which it decided to give the Registrar power to warn in all cases of infringement of the Act, without receiving the instructions of the Council in each case."

The Secretary was instructed to forward a copy of this resolution to the Secretary of the Pharmaceutical Society.

Communications were read from two members, residing at Liverpool, stating that they had been threatened with legal proceedings by the clerk to the Apothecaries' Company, for alleged infringements of the Apothecaries Act, 1815.

The cases were fully discussed, when it was moved by Mr. Barclay, seconded by Mr. Hampson, and unanimously resolved:—"That the Solicitor be empowered to defend in either or both of these cases, at his discretion."

THE ASSOCIATION OF CHEMISTS AND DRUGGISTS FOR WOLVERHAMPTON AND DISTRICT.

A Special Meeting of the above Association was held on July 6th, 1877, at 69, Darlington Street, Wolverhampton, to take into consideration a letter that had been received from the Sanitary Committee of the Town Council, addressed to the President of the Society, Mr. Fleeming. There was a large attendance of members, the President occupying the chair. After the minutes of the last meeting had been read, the Chairman read the following letter:—

"Town Clerk's Office, Wolverhampton,
"27th June, 1877.

"Dear Sir,—My Sanitary Committee has during the last fortnight been engaged in the consideration of the fact that certain medicines of a public character have been sold in the town by druggists, under names which do not in the slightest degree represent the ingredients of which such medicines are supposed to consist.

"A very grave question arises, whether under such circumstances an offence has not been committed under the Adulteration of Food and Drugs Act; but my Committee feel desirous before instituting any proceedings that all the members of the profession should have full notice that the subject is still before them, and must be dealt with, unless a different course of procedure be adopted.

"My Committee understand that you are not only the oldest druggist in the town, but are also Chairman of the Wolverhampton and District Chemists and Druggists' Association, and they have instructed me to call your attention to the above circumstances, feeling quite sure that you will take the necessary steps through the organization of your Society to prevent a recurrence of the complaints which have been made, and the further necessity of my Committee attending to the matter.

"Yours truly,
"H. Underhill, *Town Clerk*.

"Wm. Fleeming, Esq.,
"Chemist and Druggist, Queen Square."

The Chairman said that as this letter contained nothing in itself that would lead the members to understand what were the medicines alluded to he had sent a letter to the Town Clerk, in reply, asking for further information in the matter, but the answer that he received was couched in similar terms to the first letter.

A long discussion ensued as to what the medicines referred to in the letter could be. It was generally thought that as action had been taken in some parts of the country respecting the sale of Castor Oil Pills, and the absence of any Castor Oil from them, the allusion might be to that article. As no other preparation could be suggested as coming under the remarks contained in the letter, the following resolution was passed unanimously.

It was proposed by Mr. T. A. Wedge, and seconded by Mr. R. H. Lawe:—"That this meeting, whilst feeling obliged for the communication received from the Sanitary Committee, and for the action taken by them, cannot without some definite complaint made about some *one* drug or medicine, at present enter upon further consideration of the subject."

After a vote of thanks to the Chairman, the meeting separated.

Proceedings of Scientific Societies.

KING AND QUEEN'S COLLEGE OF PHYSICIANS.

The Influence of Chemical Constitution on Physiological Activity.*

BY J. EMERSON REYNOLDS, M.D., F.C.S.,

Professor of Chemistry, University of Dublin, etc.

Introduction.

On the 6th of January, 1868, a very remarkable paper was communicated to the Royal Society of Edinburgh, by Drs. Crum-Brown and Frazer, "On the Changes produced by direct Chemical Addition on the Physiological Action of certain Poisons." In that paper chemical constitution was shown to be a factor of great importance in determining the physiological action of certain substances, chiefly belonging to the group of alkaloids, and some highly interesting results were obtained. Since the date just mentioned numerous researches have been published by eminent observers on the physiological action of medicinal and other bodies, but the results have usually been discussed from the pure physiologist's point of view rather than from the chemical side. In these lectures I propose to consider physiologically active substances, chiefly from the chemist's standpoint, and while following to some extent on the lines of the research of the distinguished pioneers of this branch of inquiry, I shall venture to draw special attention to some matters which have either been overlooked or passed by with trifling notice.

I need scarcely say that it would be impossible to deal exhaustively with the wide subject upon which I have the honour to address the College, in the short time at my disposal; but I hope, nevertheless, to satisfy my hearers of the truth of the chief propositions I have to state.

It will, no doubt, be readily granted that all chemical substances introduced into the animal organism during life, and which produce any sensible effect, act either physically or chemically, and that in many cases the same substance exerts a physical *and* a chemical action.

By *physical action* we mean that kind of effect which a body can produce without suffering change of composition, or directly causing any such alteration in bodies with which it happens to come in contact. Thus a saline solution of high specific gravity—a strong solution of Rochelle salt, for example—diffuses, as a rule, more slowly through an animal membrane than a weak solution of the *same* salt. Here the effect is almost purely physical, for the rate of diffusion is dependent on the proportion of saline matter in the solution. It is true that the composition of a body, as well as the strength of the solution and other conditions, influences its rate of diffusion; but the effect of composition is eliminated when, as in the case supposed, we compare strong and weak solutions of the same salt.

By *chemical action* we mean that kind of action which involves change in *composition* of the matter engaged.

As I have already stated, the same body may act both physically and chemically; hence we must always remember that the physiological activity of a body may be due in part to the purely physical action exerted by it.

Our aim in these lectures, however, being to trace a connection between chemicial constitution and physiological activity, we shall leave physical action, and, indeed, local corrosive action also, as much as possible on one side.

Let me now explain some chemical terms which must be used in the course of my remarks, but which may not be familiar in their modern sense to some of those whom I have the honour to address.

When we now speak of the *molecule* of a body, we refer to the physical particle of matter, and this is the analogue of the ultimate particle which was long ago called an "atom" by Dalton. Within this molecule of a compound, and, indeed, of most elements, we are compelled to recognize the presence of two or more smaller portions of the same or of different kinds of matter. It is to these intramolecular portions of matter that chemists now restrict the term "atom."

Now, the atoms of elementary matter have not all the same power of uniting with each other. Thus, the atom of chlorine cannot combine with more than one atom of hydrogen (as in hydrochloric acid, HCl), whereas the atom of oxygen can unite with two atoms of hydrogen (as in water, H_2O), but with no more; while the atom of nitrogen can combine with three atoms of hydrogen (as in ammonia, NH_3), and then with an additional atom of hydrogen and one of chlorine to form NH_4Cl, or salammoniac. Finally, the atom of carbon unites with four, but no more, hydrogen atoms.

We can thus arrange the chemical elements in groups according to the number of atoms of hydrogen that they can either combine with or displace from chemical combinations, and the elements are spoken of as monad, diad, triad, or pentad, according to their position in the series.

Atomicities of the Common Elements.

Unmetallic.		Metallic.
H'. Cl'. Br'. I'. F'.	Monads.	Na'. K'. Li'. Ag'.
O''. S''.	Diads.	Pb'', Hg'', Cu''. Cd''. Zn'', Mg''. Ba'', Sr'', Ca''. Fe'', Ni'', Co''.
N'''. P'''. B'''.	Triads.	Au'''. Bi'''. As'''. Sb'''.
C^{iv}. Si^{iv}. S^{iv}.	Tetrads.	Fe^{iv}, Ni^{iv}, Co^{iv}. Mn^{iv}. Al^{iv}. Pt^{iv}, Sn^{iv}, Pb^{iv}.
N^{v}. P^{v}.	Pentads.	As^{v}, V^{v}. Sb^{v}. Bi^{v}.
S^{vi}.	Hexads.	Cr^{vi}, Mn^{vi}.

This so-called "atomicity" of an element is conveniently indicated by lines radiating from the symbol of the element, thus showing the total number of points of attraction, or "bonds," as they are often called, and consequently the total combining power of the atom.

The molecules of the elements are supposed to contain two elementary atoms of the same kind of matter in com-

* The substance of two lectures delivered before the King and Queen's College of Physicians in Ireland, being the first and second of the Annual Scientific Lectures for 1877. From the *Dublin Journal of Medical Science.*

bination with each other. According to this view the molecules of hydrogen and of oxygen may be thus represented :—

H—H   O—O

But this combination of an element with itself is feeble and very easily broken up, according to our present knowledge.

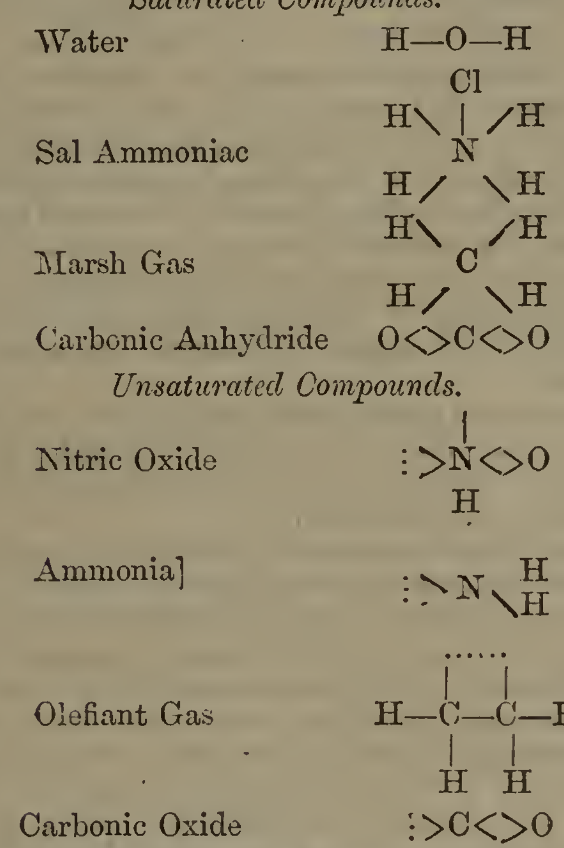
Having premised this much, I may now state that we can broadly subdivide chemical compounds into—

(*a*). Bodies in which all the "bonds" of all the atoms within the molecule are satisfied and are engaged in holding together the molecular edifice. These are called *saturated* compounds.

(*b*). Bodies in which the bonds are partially satisfied. These are called *unsaturated* compounds.

The differences between the two classes of compounds will be evident on inspection of the following diagram:—

Saturated Compounds.



Change can only take place in the molecules of *saturated* compounds by substitution. Thus the metal potassium can displace hydrogen from the molecule of water and form caustic potash; but we cannot, in any true sense, add anything chemically to water.

Change in unsaturated molecules can take place by addition as well as by substitution. Thus nitric oxide can unite with oxygen with extreme facility to form peroxide of nitrogen; ammonia gas with hydrochloric acid to form sal-ammoniac; olefiant gas with chlorine to form Dutch liquid; and carbonic oxide with oxygen, in order to produce the saturated compound carbonic anhydride.

The bonds not employed in holding together the elements of which an unsaturated compound is composed are said to become *latent*, owing, as some assert, to mutual satisfaction. This is indicated in the diagram by means of broken lines connecting the bonds.

From the statements already made, it will be easily gathered that the unsaturated compounds are, as a rule, the most energetic in their chemical relations. But I may go farther and assert that it is chiefly within the large group of unsaturated compounds that we meet with physiologically active bodies. I shall presently bring forward a good deal of evidence in proof of this assertion; but I propose to show, in addition, that the members of the group of saturated compounds which exert decided physiological action are bodies which either contain one or more atoms within the molecule capable of easy replacement by more energetic elements or groups of elements, or which are readily broken up, under certain conditions, into unsaturated molecules within the animal economy.

I hope thus to be able to satisfy you that the study of the chemical constitution of a body, or of the manner in which the elementary atoms are grouped within the molecule, is of the highest importance if we desire to explain the action of many bodies possessing physiological activity.

In seeking now to prove my case, it will conduce to clearness to state at once that I propose to bring forward evidence in support of the following propositions :—

1st. That bodies which contain the *same elements in the same proportions* can differ materially in physiological activity when compared under equally favourable conditions, and that the observed dissimilarity in action is due to difference in chemical constitution.

2nd. That bodies exist which contain the same elements *in different proportions, and are similar in chemical structure*, but which differ materially in degree of physiological activity; and that the observed alteration in action can be explained on chemical grounds.

3rd. That many bodies which are unlike in composition, but which agree in being either actually or constructively unsaturated, and are alike in certain marked chemical relations, often agree in physiological action.

4th. That the result of chemical addition to unsaturated molecules is either to destroy or materially to modify their physiological action.

Finally, I hope to show how far a knowledge of chemical principles and of the habits of chemical compounds enables us to trace the probable kind of action exerted within the living animal organism by physiologically active bodies:

FIRST PROPOSITION.

Our first proposition asserts *that bodies which contain the same elements in the same proportions can differ materially in physiological activity when compared under equally favourable conditions; and that the observed dissimilarity in action is due to difference in chemical constitution.*

We are acquainted with a considerable number of compounds which have the same centesimal composition, and amongst these I may mention the group of which acetic and lacetic acids and grape sugar are members:—

Acetic Acid	$C_2H_4O_2$.
Lactic Acid	$C_3H_6O_3$.
Grape Sugar	$C_6H_{12}O_6$.

These bodies have formulæ which are multiples by integer numbers of the group CH_2O (or formic aldehyde). Although these bodies differ in their physiological action, these differences are not very striking; hence I pass at once to the consideration of two cases which seem to have been unaccountably overlooked by physiologists.

There are two volatile liquids known to chemists which contain the same elements in the same proportions by weight, and which have the same number of atoms within each molecule. They have, therefore, the same empirical formula, which is C_2H_3N. These bodies are isomeric, or, strictly speaking, metameric,* and, strange to say, are often produced together in a single reaction. One of these bodies is poisonous; the other does not exhibit any strongly-marked physiological activity.

Both these remarkable compounds have the composition of *cyanide of methyl*, and a mixture of the two bodies was long regarded as that body. It has been shown, however, that the mixture referred to contains two volatile liquids having different boiling points. The liquid which possesses the highest boiling point (77° C.) is the true cyanide of methyl, or *nitrile*, and is a body which does not exhibit extraordinary chemical or physiological ac-

* Compounds which have the same percentage composition are *isomeric;* but we can recognize at least two classes of isomers—(1) polymeric bodies, or those whose molecular weights are different; (2) metameric bodies, or those whose molecular weights are the same, but which differ in constitution.

tivity. The other body boils at 59° C., and is called isocyanide of methyl, or the *carbamine*; this compound is very active chemically, and is poisonous.

The vapour of the *pure* nitrile* produces little discomfort when inhaled for a short time, but the vapour of the carbamine quickly produces considerable nausea, headache, and general depression. The carbamine is less easily miscible with water than the nitrile; nevertheless, the former quickly destroys life when a mixture of the body and water is injected into the blood of a dog, whereas a mixture of the same weight of the more soluble nitrile and water produces comparatively trifling effects.

It is evidently sufficient for our present purpose to know that one of these metameric bodies possesses much greater physiological activity than the other, and that the active body is one which is most energetic in its chemical relations. This marked difference in chemical and physiological activity is due to difference in chemical constitution, and the constitutional formula assigned to each body, on purely chemical grounds, sufficiently indicates their recognized difference.

Nitrile.	Carbamine.
$C \equiv N <^{\diagup CH_3}_{:}$	$:> N \equiv C <^{\diagup CH_3}_{:}$

In the nitrile the combining power of the carbon atom is represented as wholly satisfied, though two "bonds" of nitrogen seem to be latent. In the carbamine the carbon atom is shown to have but half its "bonds" satisfied. The nitrile cannot be regarded as a saturated compound because of the latent bonds of nitrogen, and the carbamine is still less so, because of the additional latent bonds of carbon. This difference in degree of chemical saturation of the atoms within the molecule evidently corresponds to the observed difference in physiological activity.

Although I leave these remarkable bodies for the present. as they have served my purpose in proving the truth of my first proposition, I would venture to commend them and their homologues to the study of physiologists. If time permitted I could bring forward a large amount of additional evidence bearing upon the same point, but I will now content myself by referring as briefly as possible to the metallic cyanides, as some members of the group are well known to be highly poisonous, while others which are easily soluble† in water, are inert or nearly so.

A metallic cyanide, or, indeed, hydrocyanic acid itself, may be regarded as the analogue of a carbamine or of a nitrile; thus—

Hydrocyanic Acid.		Cyanide of Potassium.
$C \equiv N <^{\diagup H}_{:}$	Nitrile,	$C \equiv N <^{\diagup K}_{:}$
$:> N \equiv C <^{\diagup H}_{:}$	Carbamine,	$:> N \equiv C <^{\diagup K}_{:}$

We have no means at present of determining with any degree of precision whether the cyanides of hydrogen and of metals are to be viewed as nitriles or carbamines. If we allowed physiological evidence to materially influence our opinion, we would probably conclude that they resembled the carbamines rather than the nitriles on account of their poisonous activity. It may be that the hydrocyanic acid we are acquainted with is the analogue of the carbamine, and that we may one day succeed in discovering a metameric body (another hydrocyanic acid) which will be almost inert. That day has not yet arrived however, and all we can say at present is that we know the soluble simple cyanides to be highly poisonous bodies; but we are acquainted with soluble metallic compounds rich in cyanogen, which are not poisonous; the most remarkable and best known of these is ferrocyanide or yellow prussiate of potassium.

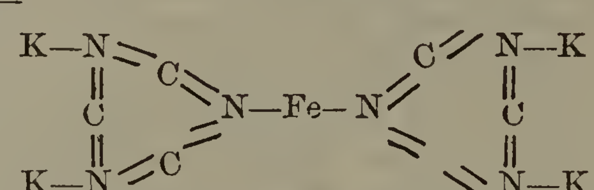
The fatal dose of cyanogen for a man is known to be two grains, if administered in the form of cyanide of potassium or as prussic acid; but five grains of cyanogen can be given to a man in the form of ferrocyanide of potassium without producing any more marked effect than slight diuresis. Ferrocyanide of potassium was at one time regarded as a double cyanide of iron and potassium, but in all true double cyanides the component metals can be recognized with more or less facility by ordinary chemical tests; in the ferrocyanide the iron cannot be detected by ordinary chemical reagents. For this and other reasons we conclude that the ferrocyanide is not a true double cyanide, but rather the salt of a new acid, into the radicle of which the iron has entered. The ordinary formula of the anhydrous compound may be thus written according to each view of its constitution.—

Double Cyanide . .	$Fe(CN)_2 + 4\,KCN$.
Ferrocyanide . . .	$K_4\overline{Fe(CN)_6}$.

If we take as much cyanide of potassium as contains two grains of cyanogen, and as much ferrous cyanide as contains one grain of cyanogen, mix the moist precipitate of the latter with the strong aqueous solution of the former, and immediately inject the mixture into the blood of a dog, the animal is almost immediately killed. If, however, we administer in the same way to another dog a quantity of pure ferrocyanide of potassium, likewise containing three grains of cyanogen, the animal survives the dose.

It is at least possible that in the first experiment we have to deal with a true double cyanide, while in the second it is certain that we have to deal with a very differently constituted body.

A true double cyanide of iron and potassium has not yet been obtained in the solid form, but if it exists for a short time in solution, its *unsaturated* cyanogen radicle is doubtless as free to exert its poisonous action as in other double cyanides. In the ferrocyanide, on the other hand, the unsaturated cyanogen groups have united with each other under the influence of the iron to form a compound in which all the atoms are fully engaged in binding together the molecular structure, and which need not be supposed to have within it any latent bonds, if we except the seemingly unimportant case of the iron atom. The developed formula of the ferrocyanide may be then written—



The instances I have now given in evidence of the truth of our first proposition might be largely supplemented but I apprehend that no one will doubt that the degree of saturation of the components of a molecule, and consequently its constitution, materially influence its physiological activity.

SECOND PROPOSITION.

Our second proposition asserts *that groups of bodies exist which contain the same elements in different proportions, and are similar in chemical structure, but which differ materially in degree of physiological activity; and that the observed alteration in action can be explained on chemical grounds.*

At the recent meeting of the British Association, at Glasgow, the results of some highly interesting experiments on the physiological action of the sodium salts of the three kinds of phosphoric acid were communicated by Professor Arthur Gamgee, who, in conjunction with Messrs. Priestly and Larmuth, discovered the existence of remarkable differences in activity between the three compounds. The details of this investigation have not yet been published, but the results obtained, if confirmed

* There is so much difficulty in obtaining the nitrile free from dangerous impurity that the experiment ought not to be unnecessarily repeated.

† Difference in solubility is often alone sufficient to account for difference of physiological activity; it is, therefore, of special importance only to compare bodies which can be absorbed with equal or nearly equal facility.

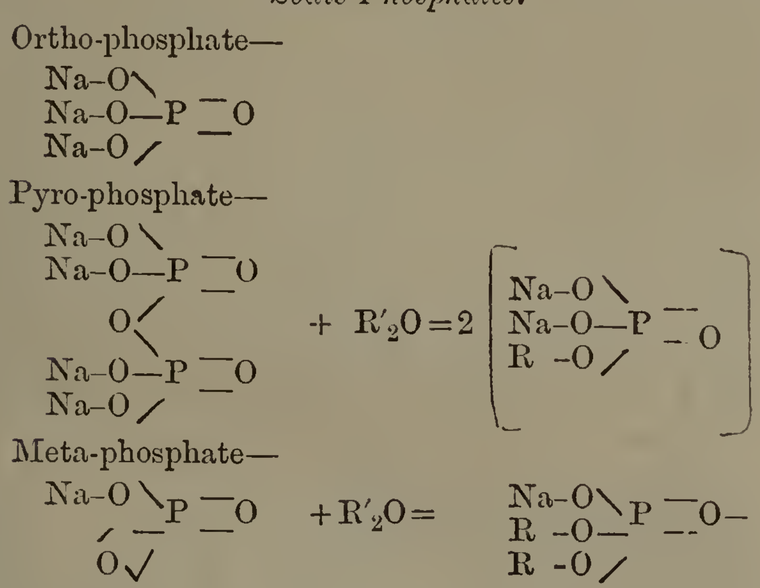
by further inquiry, constitute remarkably strong evidence in support of our proposition, though the authors do not seem to be aware of the special importance of their discovery, as I shall presently point out. The researches of Graham first made us distinctly acquainted with the well-marked group of phosphoric acids :—

Ortho-phosphoric Acid (Tri-basic) . H_3PO_4.
Pyro-phosphoric Acid (Tetra-basic) . $H_4P_2O_7$.
Meta-phosphoric Acid (Mono-basic) . HPO_3.

Corresponding sodic salts are obtainable in which the hydrogen of each acid has been replaced by the equivalent of the alkali metal. Messrs. Gamgee, Priestly, and Larmuth's experiments were conducted with the three sodic phosphates just referred to. Standard solutions of the salts were prepared of such strength that equal volumes contained the same weight of phosphorus. The action of each solution, when injected in the same proportion into the blood of an animal, was carefully noted, and it was found that the sodic ortho-phosphate is almost inert, while the pyro-phosphate is an energetic poison, and the meta-phosphate is also poisonous, but less active than the pyro-phosphate. The authors have shown that both the poisonous bodies act in nearly the same way on the animal organism. When either salt is injected subcutaneously into the system of a frog, it leads to paralysis of voluntary motion, to arrest of respiration, and soon to stoppage of the heart. The reflex functions of the spinal cord are very soon affected by the poison, but it has no action on the irritability of muscles or nerves.

We have here, then, evidence of a wide difference in degree of physiological activity between the sodic orthophosphate and the corresponding salts of the other two phosphoric acids, though all three bodies contain the same elements, and are similar in structure, but contain different proportions of their components. I understood Professor Gamgee to state at the meeting of the British Association that he attributes the poisonous action of the pyro- and meta-phosphates to a possible reduction of either compound in the organism to phosphoretted hydrogen or to elemental phosphorus.* The explanation I have now to offer is a very different one, and will be easily understood with the aid of the following diagram :—

Sodic Phosphates.



An examination of those developed formulæ will satisfy you that each of the phosphates may be consistently supposed to contain a triad nucleus, consisting of one atom of pentad phosphorus, and one atom of diad oxygen, both "bonds" of which latter are exclusively united with phosphorus. In the ortho-phosphate the three bonds of the nucleus are completely satisfied with the basic radicle Na′O, or, more generally R′O, when R is some monad metal, or metal-like body. In the pyro-phosphate two only of the three bonds of the nucleus are satisfied by the basic radicle, the third bond being connected with oxygen, which serves to tie it to another phosphoric group. Although all the bonds are saturated in this compound, they seem to be only fully satisfied when united with basic radicles—hence, on treating one molecule of a pyro-phosphate with one molecule of the oxide of any monad metal, two molecules of an ortho-phosphate are formed, as shown in the diagram. In the meta-phosphate but one of the three bonds of the nucleus is satisfied by a basic radicle, the remaining two being saturated by, but apparently not really *satisfied* with, one atom of oxygen; for one molecule of meta-phosphate, when treated with one molecule of an oxide, or a corresponding group, yields one molecule of ortho-phosphate.

As a matter of fact both the pyro- and meta-phosphates are unstable, especially in aqueous solutions, and tend to pass into the particularly stable ortho-phosphate by addition of the basic or allied material, provisionally represented in the diagram by R'_2O. According to the general principles already stated, the ortho-phosphate ought to be almost inert, and the other two phosphates physiologically active: *à priori* reasoning would, then, lead us to the conclusion already arrived at by the experimental method in the course of the valuable investigations of Messrs. Gamgee, Priestly, and Larmuth. Assuming now that further inquiry will confirm the opinion of those observers that the pyro-phosphate is more poisonous than the meta-phosphate, we have to account for the difference in activity of the two bodies. This difference is one of degree only and not of kind, as far as we can at present judge. The difference in intra-molecular satisfaction is also one of degree only, and we may reasonably conclude that the pyro- and meta-phosphates retain within the animal organism their tendency to attract and to be attracted by basic material. If, then, their poisonous action is due to the exercise of this power, the question arises whether or not both bodies poison by withdrawing basic material from some important organ. The experimental answer to this is a decided negative, for the pyro-phosphate is most poisonous; yet that body, for a given weight of phosphorus, is capable of withdrawing much less than the meta-phosphate (see diagram).

(*To be continued.*)

* Since the above was written, Professor Gamgee has published a paper on the subject in the *Journal of Anatomy and Physiology* for January, 1877, in which he expresses opinions more closely in accordance with the view taken by the lecturer.

Parliamentary and Law Proceedings.

Poisoning by Arsenic.

An inquest was held on the 4th inst. respecting the death of Sidney Caillier, aged 3, of Paradise Street, City Road. It appears that on the previous Saturday his brother picked up a piece of green chalk, which he put in his school bag. On Saturday the deceased went to the bag, and mistaking the chalk for a sweetmeat, sucked it. He immediately became so ill that he was taken to the Royal Free Hospital, where he died the same day. Dr. Sharpe said the green chalk contained arsenic, which had caused death. Verdict—Death from misadventure.

Review.

Aids to Chemistry, specially designed for Students Preparing for Examinations. Part I., Inorganic: Oxygen to the Metalloids inclusive. By C. E. Armand Semple, B.A., etc., etc., etc. London: Baillière, Tindall and Cox. 1877.

The author of this little book states in his preface, that his endeavour has been "to present the leading facts of the science in as systematic a manner as possible." The object of the treatise is sufficiently explained by its title-page. If this were not so, the very first line of the subject matter would suffice to show for what purposes the book was written. Thus it opens with Oxygen, "Symbol, O; Combining Weight, 16; Density, 16." That is to say it tells the reader of certain facts which without a previous knowledge of other matters he cannot understand. That is however a secondary consideration; the object of the book is to present facts; in short it is a "cram" work. The vast examinational system now so widely adopted in this and other countries is not an unmixed good. It leads to a system of cramming of whose magnitude many persons have no conception. Students preparing for examinations know that they will be questioned regarding facts and too often they acquire such a knowledge, which is utterly unmeaning to them, unacquainted as they are with the principles which underlie those facts. Hence so soon as they have passed their examinations and appeared duly on the lists, their facts are forgotten because they possess no mental appreciation, or at best an imperfect one, of the relations existing between the said facts. "Knowledge is power," but it is only a means to an end, and when it is disposed within the memory like bon-bons in a box, piled up piece upon piece, it constitutes only so much padding to the intellectual engine.

It may be urged that so long as the present examinational system lasts, so long will it be necessary to provide treatises such as the one before us. Be this as it may, we cannot recommend such works, and we therefore unhesitatingly condemn the use of Mr. Armand Semple's 'Aids to Chemistry.' Most of the facts communicated in it are correct enough so far as they go, but this is the "be all and the end all" of them; in arrangement they differ little from that displayed in other and similar works, many of which constitute but condensed abstracts of more complete and recommendable volumes. Macaulay once said that in a Turkey carpet there are all the colours which occur in a good picture, and that in Mr. R. Montgomery's poems, there are all the words which when properly arranged make poetry; so it might also be said that in Mr. Semple's 'Aids to Chemistry' there are all the facts necessary for the construction of a system of chemistry. They lack however that arrangement, display of concatenation and relationship so essential to the constitution of a systematic treatise on chemistry.

In the present part of his work, Mr. Semple describes, in brief language, the non-metallic elements, their sources, methods of preparation and tests. The more important compounds are similarly treated and represented by the abundant use of formulæ. Further on in the book, we come to the consideration of what Mr. Semple terms the metalloids,—sulphur, phosphorus, arsenic, boron, silicon, selenium and tellurium. We have seen that the book treats of those substances ranging from oxygen to the metalloids, but why oxygen and carbon should not be included among the metalloids, or why sulphur and tellurium should be, or again why arsenic and tellurium should not be reserved until Mr. Semple reaches the metals, we know not. It is about as interesting to mentally calculate the distance of oxygen from the metalloids, as that obtaining between infectious diseases and Professor Tyndall's germs. Mr. Semple brings his book to a conclusion with some observations upon the metric system of weights and measures; the measurement of temperature; expansion of gases by heat; the relation of the volume of gases to pressure; and the property of diffusion of gases.

There are errors in the work under consideration, as in all books. Thus we are told on page 1, that oxygen is "a dyad element replacing two monads as in the case of water $\left.\begin{matrix}H\\H\end{matrix}\right\}O$"; and this is a kind of error repeated frequently by our author. He also gives several methods of preparing ozone which are not correct, or at least doubtful, viz., the action of sulphuric acid upon potassic permanganate and the aerial oxidation of phosphorus in the presence of water (p. 2). It is certain that this last stated method gives peroxide of hydrogen. Writing on page 5, of the combination of oxygen with hydrogen, it is said "*the oxyhydrogen blowpipe* is employed to develop the great heat, evolved by the combination of the two gases."

Ammonia is described (p. 9) as a colourless, irrespirable gas with the "odour of hartshorn;" and on page 13, iron is stated to be unattacked by nitric acid. Chlorine is described as "never native" (p. 25), and bleaching powder receives the erroneous description of a *mixture* of chloride and hypochlorite of calcium (p. 27), whereas it is well known to be a definite chemical combination which is resolvable into these substances.

There is also a looseness of description exhibited in the book before us, which is very objectionable. For instance, on the second page of the book, one of the tests for oxygen, is given as follows:—"Phosphorus inflamed and placed in this gas exhibits dazzling brilliancy." This is quite true, but a student attempting to make this experiment, not having been previously informed of the dangerous nature of phosphorus, might not improbably witness the "dazzling brilliancy" under circumstances not altogether pleasant to his body.

Again, among the sources of sulphur (p. 34) Glauber's salts and gypsum receive mention, and in the next paragraph, under the heading of "preparation," we are told that to obtain pure sulphur, "the mineral in which it is contained is heated in earthenware pots," etc. Although this method would serve very well for pyrites, it would scarcely answer with gypsum. Further (p. 41), hydrogen disulphide is described as "an oily liquid, closely resembling H_2O_2." Enough has been said, to show the character of Mr. Semple's 'Aids to Chemistry.' The title itself is not free from objections; the work still less so.

Dispensing Memoranda.

We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageoue were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be conidered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.

[2]. DISPENSING QUERY.—Use dry measures. 1. Put the glycerine into a 4 oz. bottle. 2. Mix the Tr. Tolu and Tr. Opii Ammon. 3. Mix the Chlorodyne (Collis Browne's) and the Vin. Ipecacuan. 4. Add gradually, and shaking gently between each addition, first No. 3, and then No. 2,—to No. 1. A homogeneous brown mixture will result, which will not separate on standing.

Z. V. Z.

[10]. EXT. TARAX. LIQUID.—Which preparation of Taraxacum should be used when Ext. Tarax. Liquid. is prescribed in a mixture? The old fashioned treacly preparation made by dissolving Ext. Taraxaci in water, and adding a little spirit, the more elegant Liquor Taraxci prepared "in vacuo," or the Succus Taraxaci, B.P.? What rule is adopted in leading dispensing establishments?

S. J. W.

TURPENTINE EMULSION.—Mr. Louis Genois reports (*Amer. Journ. Pharm.*, vii., 346), that in a series of experiments on the emulsionizing of oil of turpentine, he obtained the best results with castile soap. The smallest proportions he found to answer were 10 grains of soap to 1 ounce of oil and any quantity of water. The soap is put into a round-bottomed mortar, the oil added by degrees with constant trituration; when well mixed, the product is placed in a bottle, half an ounce of water is added, the whole is shaken vigorously, a little more water is added, and the mixture is again shaken. The result is said to be a very white emulsion, which remains permanent almost indefinitely, and will not separate on the addition of a gallon of water. The soap should be dry and in very fine powder.

Notes and Queries.

[551]. SACK INK POWDER.—

Pulv.	Gallæ	lb.iij
„	Hæmatoxyli	lb.iss
„	Gum. Acaciæ	℥xij
„	Ferri Sulph.	lb.iss
„	Alum.	lb.ss

Misce.

C. J. B.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Admission of Reporters.

Sir,—I apprehend the discussion at the late meeting of Council upon the motion of Mr. Hampson, for "the admission of reporters from the recognized journal or journals representing pharmacy and the trade," will be read with considerable interest by many of our brethren; how far the majority will agree with the result is another question. I must confess my own entire disagreement both with the line of argument and its issue.

The whole gist of the matter rests upon the question whether the Pharmaceutical Council is a private or public body. This point being settled, the privacy or otherwise of its deliberations would follow as a matter of course.

Upon what basis any gentlemen can argue that it is a private body I cannot conceive; it is perfectly true the privilege of election rests with members of the Society alone, but once elected those gentlemen immediately lose their individuality as private representatives, and at once assume the position of legislators for the entire body of chemists and druggists; they are recognized by the Legislature, not as representatives of a private society, but as the executive of the trade at large.

I would refer your readers to the Pharmacy Act, 1868, the first and second clauses of which clearly set forth that "it shall be unlawful for any person to sell or keep open shop, for retailing, dispensing, or compounding poisons, or to assume or use the title "Chemist and Druggist" or Chemist or Druggist, or Pharmacist, or Dispensing Chemist, or Druggist, in any part of Great Britain, unless such person shall be a Pharmaceutical Chemist, or a Chemist and Druggist, within the meaning of this Act, and be registered under this Act, and conform to such regulations as to the keeping, dispensing, and selling of such poisons, as may from time to time be prescribed by the Pharmaceutical Society with the consent of the Privy Council." And again, "That the *Council* of the Pharmaceutical Society is herein referred to as the Pharmaceutical Society." Putting these two clauses together, we at once see that the Council is not recognized by the Legislature as a private, but as a public body. To guard the public safety is its one recognized office and duty.

The next question is—The Council being a public body, are its deliberations to be public or private? To this query I can see but one reply, and on what logical ground the opponents of Mr. Hampson's motion base their arguments I fail to see.

Mr. Sandford tells us "the Council often has private business to discuss, and therefore it is a matter for grave consideration whether other reporters should be admitted." Has the Medical Council no private business to transact? Has not every legislative council and board private business to transact? and yet perfectly able to conduct their general meetings under the flying pen of the reporter? For what purpose are committees formed but, among others, that such special subjects may therein have the benefit of private discussion and matters matured for the final settlement of the Board or Council?

Mr. Bottle repudiates the idea from a financial point of view, that the Society having valuable property in the *Pharmaceutical Journal*, it would be injurious to its interests to admit others to so rich a feast with which to fill their columns to repletion. Can it be that the merits of our Journal rests simply in these reports published once a month? I rather take this statement as an admission of the objection so often heard, that the Journal is far in advance of the requirements of the trade, rather than an argument against the motion. Mr. Bottle further argues that "hitherto the proceedings of the Council have not been carried on in that strictly formal way which would be creditable to the Council." Surely this is an admission which speaks volumes in *favour* of the motion. If after so many years' experience the Council has not yet learnt how to conduct its duties in a business-like manner, the sooner its delinquencies are removed the better for all parties.

Passing over the observations of other gentlemen I would draw attention to those of Mr. Betty, who comes before us in an entirely new character; he who in June, 1872, could say at the meeting of Council, "Last year on my own motion for the admission of reporters, the stronghold of secretness fell down like the walls of Jericho at the trumpet blast!" now, under the awakening influence of the Council Chamber, sees the danger of those fallen walls, and viewing with awe the steady advance of the hosts would fain restore those battlements and keep at bay the clamouring enemy of peace and quiet. The very idea of such an indignity as the admission of the reporters of the *Chemist and Druggist* fills his soul with horror. The *Pharmaceutical Journal* alone really represents pharmacy pure and simple; how, then, can we allow our scientific discussions on co-operative stores and trade interests to be defiled by insertions in the pages of such a commercial production as the *Chemist and Druggist*? Thus argues our oratorical representative and once warm advocate.

Allow me to ask, sir, Where is the argument adduced by the opponents of Mr. Hampson's motion which conclusively weighs against its adoption? The Council has important public functions to perform, the entire trade is by Act of Parliament put under its control and guardianship. Who, then, has a better right to a full knowledge of what passes at its meetings than those for whom it legislates? There still remains a ray of hope that the effort so well made by Mr. Hampson may yet result in success. It is suggested by more than one speaker that were the editor of the *Chemist and Druggist* to make a formal application for the admission of his own reporter it would not be disregarded. It is to be hoped that in the interests of the trade that gentleman may feel it his duty to make such an application, and that the Council may yet retrieve the false step so unfortunately taken at its last meeting.

Edwin B. Vizer.

Belgrave House, Cliftonville, Brighton.
July 11, 1877.

The Council Prizes.

Sir,—The opinions of many, on the examination papers for the Council prizes, having been recently brought before the readers of this Journal in a letter from myself, it would be unnecessary for me to refer further to them, were it not that your editorial notes of them, and the letter from

"*Arator*," contain certain assertions and conclusions which I feel called upon to refute. "*Arator*" concludes that because I happened to express dissatisfaction with last year's questions, I am "never happy unless" I have a "grievance to air," an accusation as unjust as it is illogical, and in the same strain your editorial infers that I, deserving blame, am trying to cast it on others. Further, you state that my criticisms betray that I am "not in the habit of perusing the scientific portion of this Journal." Upon what do you base this assertion? Does it follow, because I think certain questions were ill-suited for Major candidates, that therefore I knew nothing about them. In opposition to your remarks, I beg to state that I rarely read any other part of the Journal, and farther that I take notes of all such papers as those referred to in my note-book, for further reference. It so happens that I did read the papers in question, and took notes on them, but surely no reasonable examiner can expect a candidate to keep all such facts in his head. It surely is carrying matters too far, to suppose that pharmacists must remember all the papers which have appeared in the Journal during the last few years, and be able to write statements on them if called upon. It is but true that candidates should apply to the best sources for information, but if he must get up the Journal for an examination, it is a question of best memory, and not of sound knowledge. I might enumerate many papers which have appeared in these pages, but which I very much doubt if "*Arator*" (whose *nom de plume*, if literally translated, would point out one of our best rising pharmacists) always carries in his mind. On this point at least, I trust many will agree with me. When writing my former letter, the paper on Pareira Brava in the Journal escaped my memory, and on this single point I crave toleration.

I was perfectly aware that the test for nitro-benzol in oil of bitter almonds is given under materia medica by Scoresby-Jackson, but this does not alter my views. In answer to "*Arator's*" question, I do not profess to draw any line between materia medica and chemistry, but think a question more purely relating to the former should have been given. The question itself is very simple. "*Arator*" has couched his language with regard to the quality of my championship, so as to leave it doubtful whether he refers to Scotch students, or to myself. If he refers to myself, my name and qualifications, already known to you, are at his disposal. I would in conclusion suggest that some evidence of original work, be it great or small, be required next year of each candidate; a far more searching test than the remembrance of certain papers in the Journal.

AULD REEKIE.

Edinburgh July 17, 1877.

MEANING OF THE WORD "MEDICINES."

Sir,—As distinguished from the word drug, medicine implies a curative relation to some definite bodily disorder.

If a druggist be not permitted to ascertain, or assist his customer to ascertain, what drugs are most suitable, then his right to prepare, compound, dispense, and vend them "as medicines" is extinguished, and he becomes a mere vendor of drugs. He may sell tincture of catechu as an astringent, because his doing so does not affirm it to be medicinal. In such case he may not prepare, compound, dispense and vend it as a diarrhœa medicine on his own judgment and responsibility.

Proprietors of patent medicines, through the medium of newspapers, almanacks, handbills and pamphlets, prescribe for the general public, and it certainly is inexplicable, if it be that a druggist may not address himself to the individual, and compound *impromptu* a specific to meet one case, as they address themselves to an aggregate—that is to say, the public—which is made up of individuals.

In your report of Apothecaries' Co. *v.* Harrison, Mr. Nathan remarked, "that as long as chemists confined themselves to the buying, preparing, compounding, dispensing and vending of drugs, they would not be open to any interference." Now, unfortunately for the Apothecaries' Company, the Act in the section quoted does not say drugs—it says medicines.

J. W.

York, July 16, 1877.

MEANING OF THE WORD "DISPENSER."

Sir,—I have been waiting to see some further information about "the meaning of the word dispense," a topic started by J. W. at p. 956, of the previous volume, and continued subsequently, and which would probably have been of sustained interest had some of our respected authorities upon such subjects had the time and the will to have given their aid. By way of keeping the topic going, I beg to offer the following remark.

The dispenser of the present time derives his name from a very ancient source, but is now the only representative of a numerous family. Dr. Ash, a most careful lexicographer, in 1775, takes the term from the French *dispenser*, but we may go farther than that, as the French derived from the Latin, in which language the word has always an underlying meaning of administration as opposed to authoritative direction. For a long time, the Latin dispensator held the position of general adviser and agent in all sorts of matters requiring special knowledge and habits of business. Any gentleman anxious to analyse the dialectic value of the term will best find it in the three Greek forms—διέπω = administro, rego: διοικέω = ordino: and διανέμω = divido (Littleton, 1678; Scrivelius, 1805; Donnegan, 1846).

The elucidation of the value of the word dispense may not influence the legal decision in R. *v.* Shepperly, but, while wishing Mr. Shepperly and all others speedy relief, no harm can happen to him from our present little discussion.

THOMAS B. LANGRIDGE.

Midhurst, July 13, 1877.

J. T. Fox.—(1) *Euphorbia amygdaloides*; (2) *Lepidium campestre*; (3) *Galium cruciatum*; (4) *Lysimachia Nummularia*; (5) *Gnaphalium uliginosum*; (6) *Veronica Beccabunga*; (7) *Œnanthe crocata*; (8) *Matricaria Parthenium*; (9) *Galium aparina*; (10) *Scutellaria galericulata*; (11) *Juncus effusus*, probably, specimen imperfect; (12) *Juncus acutiflorus*, probably, specimen imperfect. Our correspondent must in future limit the number of specimens sent to six.

G. S.—*Euphorbia Paralias*; *Linaria repens.* The Curator would be glad of a good specimen of the latter.

H. C. Letty.—The Royal Dispensary for Diseases of the Ear is in Frith Street, Soho Square. The surgeons, according to the Medical Directory, are Messrs. W. Harvey and U. Pritchard, M.D. Probably the other information you require could be obtained by addressing the Secretary, at the Dispensary.

"*Hydrobromic Acid.*"—The use of the drachm is inconsistent with the inference that avoirdupois weight is intended. We notice that in our American exchanges, what is claimed to be the original formula, "containing 10 grains of bromine to the fluid drachm," is given thus, troy weight of course being used:—

"Bromide of Potassium . . .	120 grains.
Crystallized Tartaric Acid .	153 ,,
Water	1 fluid ounce.

"Dissolve the bromide in the water, then the acid. Place in cold water twelve hours for precipitation, and decant."

T. P. B.—We do not know what is designated under the name. If you send a specimen we will try and give you the information.

"*G.*" (1) *Crepis virens*; (2) *Œnanthe pimpinelloides*; (3) *Lepigonum marinum*; (4) *Lepturus incurvatus*; (5) *Brachypodium sylvaticum*; (6) *Schœnus nigricans*; (7) *Agrostis vulgaris.*

"*Fidelis.*"—(1) The colour is due to oxidation, and the liquid state to the attraction of a small quantity of moisture. It would not be worth while to attempt its restoration. (2) Twaddell's hydrometer, for testing liquids heavier than water, is so graduated that the number of degrees indicated multiplied by five, and added to 1000, gives the specific gravity with reference to water at 1000.

"*Quærens.*"—The nature of the crystals could be determined by analysis.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Lamplough, Mr. Wilks, Mr. Turnley, Mr. Anderson, Mr. Piesse, Mr. Ransom, Mr. Perks, A Dispenser, Mr. Gibbs, W. H. R., T. H. W.

Erratum.—On p. 27, col. i., line 31, *for* (sp. gr. 1·169), *read* (sp. gr. 0·924).

"THE MONTH."

The present is a time of year rarely characterized by great activity in scientific research, so far, at least, as the publication of results is concerned. Many scientific societies conclude their terms sooner or later in June, and not until the autumnal meetings of the British Association, the British Medical Association, and the Pharmaceutical Conference prepare scientific men for another session's work, do we hear of any great progress in those domains of science which are of special interest to the readers of these columns.

As is well known to most of them, an attempt has been in progress for some time past, to organize the chemical profession, or in other words those professional gentlemen who practise as analytical and consulting chemists. Though such a movement can only slightly affect existing individuals and interests, there can be no doubt that a professional institute might find its function in future years or in another generation to be one of no mean kind. The profession which could scarcely be said to have had an existence fifty years ago is to-day one of importance and dignity, justly comparable with other professions, such as those of law, medicine and the church. At the same time it cannot be disputed that the rate at which professional chemists are generated is one in great advance of the demand, and, in consequence, men have too often resorted to practices which are strictly speaking unprofessional and undignified, notably resulting in what is termed in trade "cutting down." Besides this evil there is another and a more serious one calling for rectification, namely, the want of a standard of knowledge, the possession of which constitutes the claim of a man to practise. Instances have constantly come before the public, where chemists have made mistakes and blunders, and even where professionally immoral conduct has been proved. The projected organization was therefore proposed to contend against and rectify these and other evils.

The originators of this movement were not certainly and strictly speaking, professional chemists—or at least some of them were not, and there was not a little danger at the onset that from this cause, and want of confidence in the whole project, it would come to the ground. However, after considerable explanations and concessions among those who joined or interested themselves in the organization movement, it was at last fairly started and has made considerable progress. It is not possible to enter into the matter at all in detail, because hitherto the transactions have been of a private nature in a large measure, and hence to do so would constitute a breach of confidence. After successfully surmounting several difficulties, a fresh one has arisen, consisting, so far as is known, in a protest against the registration of the Institute of Chemistry, on the ground apparently that the objectors gravely suspect they will be refused admission into the body. How far this is possible, it is difficult to say; whether their fear has its origin in a wavering conscience or in groundless apprehensions, they know best. At any rate a contemporary has taken up their cause and unduly magnified its importance. This so-called determined and powerful resistance may prove to be a pitiful wail against inner consciousness and outward circumstances, but if the men who participate in it have a genuine care for their profession and its practice, they should rather lend a helping hand than oppose a resistance which will, from its nature and cause, probably prove futile. But how our contemporary makes itself acquainted with the details of the proceedings and transactions of the Institute is not clear. It certainly seems to indicate a breach of confidence on the part of some officer of the Institute, and if this be so it would be only gracious on his part to resign office, more particularly if it be that he is not at one with his brothers in office, or satisfied with the objects of the organization controlled by the body of which he is a member.

While on this subject, we may take note of the formation of a Sanitary Institute during the past month. A sort of inaugural meeting was given at the Royal Institution on the 5th inst., when there was a great deal of talking, fussiness and effervescence. Dr. Richardson gave a general address and several well known foreign sanitarians were welcomed. Of course the objects of the association consist in the prevention of disease and the maintenance of health, but there are so many similar institutions already existing, having like objects, that it is not easy to see why this new one was formed. The founders propose to include sanitarians of both sexes as working associates, but we rather question whether the Institute will ever accomplish anything more successful than the dinner which was enjoyed at the Grosvenor Gallery Restaurant under the chairmanship of Dr. B. W. Richardson.

In chemical science there is little to note this month. In a contribution to the *Chemical News* of July 13th, Dr. C. R. A. Wright gives the analysis of two Australian wines, and devotes especial attention to the presence of iron as a natural constituent. Dr. Wright certainly admits knowledge in the past of the occurrence of iron in the ashes of some wines, but he is not "as certain as to how far this iron was precontained in the grape juice employed." To determine this point in an absolutely satisfactory manner, it would be well to employ grape juice in the investigation, and not wine itself, however genuine and carefully prepared. But the fact is that chemists at all experienced in wine chemistry were previously perfectly well acquainted with most of the facts brought forward by Dr. Wright. If a man drinks a cuprous solution, copper may be detected afterwards in his body, and it has been shown that plants assimilate with ease a great variety of matters not essentially, and in the truest sense unnatural therefore as constituents. Iron is one of these, and recently a striking instance was brought forward in these pages, of a case of lead poisoning caused by a person eating cabbages grown on a soil containing white lead. It is not at all likely that the traces of iron often found in wines (and other than Australian wines) exist there in a form at all analogous to blood hematin, and therefore it was not surprising that Dr. Wright found the iron to exist in wine in a state of combination admitting of dialysis. The amount of iron was in both cases ·01 gram (calculated as protoxide, FeO) to the litre, and he compares the wines containing it to "lactophosphate of iron" and "Parrish's Chemical Food," finally suggesting a medicinal value for the said wines as "highly agreeable tonics." No doubt the wines, if good, like all others which are good, are worth drinking, but that from the traces of iron contained therein they are any better as tonics or otherwise, this is too much even to suggest. Parrish's food consists of phosphates of iron and lime; the wine analysed by Dr. Wright contained ·01 gram FeO to the litre; to institute a comparison between such substances requires a certain amount of imagination, and when expressed sounds very much like a "puff."

Chemical elements have been cropping up of late, like new potatoes, and now Mr. Kern, an engineer of St. Petersburg, announces his discovery of yet another, which he calls Davyum. He has obtained it from some residues obtained in the working of platinum, by first precipitating the ruthenium, and heating the mother liquors with nitrate of ammonium. The red precipitate thus obtained yields davyum on calcination. From the theoretical considerations developed by M. Mendeleef, Mr. Kern ranks davyum between molybdenum and ruthenium, and assigns to it a hypothetical equivalent of 100. So far so good; but, as Mr. Allen points out in the *Chemical News*, of July 20, the characters of davyum yet ascertained are not particularly special or striking, and as Mr. Kern's contributions to analytical chemistry have not always been novel, or even correct, it would be well to exercise a wise reserve before accepting the existence of a new metal, although Mr. Kern may be prepared to stake "his Davy" upon it.

The Lavoisier medal of the Société d'Encouragement pour l'Industrie Nationale has been presented to Mr. Walter Weldon for his process now so largely employed in the manufacture of chlorine. By this process more than 100,000 tons of bleaching powder are made annually, besides a large quantity of potassic chlorate; whereas about ten years ago, the total make of bleaching powder in the world did not amount to more than 50,000 tons. M. Dumas, in presenting the medal, pointed out that through Mr. Weldon's process every sheet of paper and every yard of calico has been cheapened. The only other previous recipient of this medal is M. H. St. Claire Deville, to whom it was given in 1870.

The telephone is a physical instrument, which is at the present moment attracting much interest, and although it is only as yet a scientific toy, it may serve some useful purposes in the future. In construction it is really as simple as it is ingenious. By means of a battery an electric current is sent through a wire of any length, and to this wire may be communicated, by the agency of a key board, the vibrations of any one of a series of tuning forks (the whole forming a complete octave), kept in constant vibrations by means of the trembler of an induction coil. In this way the rate of vibration of any one fork, and consequently the pitch of any particular note, may be transmitted to the wire of the telephone. The wire terminates in an electric condenser and sounding disc, consisting of a thin sheet of gutta-percha coated on both sides with silver foil, the attractions and repulsions of which are communicated to the atmosphere as musical sounds. In some experiments which have recently been conducted, various popular airs have been transmitted by means of the instrument from one place to another. In the dim vista of the future the love-sick heart may ease its cares by cooing its plaintive song to the object of its affections, although oceans may roll between.

Just a word in relation to a paper which has been reproduced in the columns of this Journal, and which forms the subject of two lectures by Dr. Emerson Reynolds. As stated in these lectures, Drs. Crum-Brown and Frazer were the first to call special attention to the relations existing between chemical constitution and physiological action of substances. This subject was taken up by a number of physiologists, among them, by Dr. McKendrick and Mr. Dewar and more recently by Dr. Gamgee and some of his students. Now, although it must be granted that a subject of any merit presents a special interest when reviewed in a special light, it is open to question whether the results of experimental science in this direction have been of any considerable value or promise. But apart from this question the whole matter has nothing new in it and but reveals a slowly growing appreciation of the fact that the human body is constituted of chemical principles of like nature and properties with those more particularly studied in the laboratory. And as it is possible by our knowledge of the nature and properties of substances to predict in some measure their action one upon the other, and, in fact, to foretell their next states, so the same holds good when the substances entering into the composition of the animal body form one side or both sides of the equation. Hydrochloric acid acts upon chalk with the evolution of carbonic acid, and it matters not whether it happens in a beaker or in the human stomach, only the one reaction is regarded as a chemical one and the other too often as a purely physiological one. Granted sufficient knowledge of two bodies, and securing the contact of those substances, it is possible sometimes to predict the result. If one of those substances happens to form part of the brain or liver, or lung tissue, then if the other substance be swallowed and come into contact with it the same result will ensue to a certain extent. The retarding influence of vital force, as we are pleased to call it, arises from the state of combination already possessed by substances forming part of the human body, and any experiments which physiologists may perform, having reference to the physiological action of chemical substances, can only result in a more or less imperfect knowledge of this retarding influence. Even when that is known it cannot be considered an absolute advance, because in the first place the action of any substance, be it physical or chemical, is very difficult to localize, and a knowledge of the affected parts is equally difficult to ascertain; and then, after all, the composition of the substances so affected is at the best but very imperfectly known. Above and beyond all other matters affecting health and disease and a knowledge of life, a greater acquaintance with pure animal chemistry is necessitated.

"The Chemistry of the Future" is the title of a paper in the July issue of the *Quarterly Journal of Science*, but this is somewhat of a misnomer, dealing as the article does quite as much with the chemistry of the past and of all ages. In fact, it concerns itself with the theory of the evolution of the chemical elements out of a hypothetical primordial matter. Mr. Huggins' and Mr. Lockyer's researches into the chemical constitution of the sun and other planets are briefly alluded to, the bulk of the paper being concerned with M. Mendeleef's periodic laws regarding the chemical elements. The article by no means does justice to the theory of the homogeneity of matter and the question of its evolution, about which so much has been written since the days of Aristotle. This is a subject to which at an early opportunity we propose to devote some consideration in these pages.

A note contained in *Nature* of June 28th deserves mention by reason of its incorrectness and injustice. After alluding to the varied and cultured tastes of the Emperor of Brazil the note goes on to say that during his stay in London he "conversed with almost every man of science who has been doing any original work during the past few years." In the first place this is impossible, and in the second place it is unjust to those many scientific men who have *done* much original work of late years. It would be interesting to learn whom "almost every man of science" includes in the sense intended by *Nature.*

Dwellers in noisy and smoky cities are now everywhere hurrying away on the wings of steam to enjoy their well earned holidays in some pleasant nook in the country, or in some favourite seaside resort, each one bent on the pursuit of his peculiar hobby. The botanist with his well worn vasculum will probably be seen here and there eagerly stowing away floral treasures, while others preferring the study of fruits to that of flowers will be discussing the merits of different species through the medium of another sense than that of sight. In a few places, such as Hitchin, Mitcham, Banbury, Market Harboro', etc., the harvest time of medicinal plants is now drawing near, and the sweet odour of lavender and other fragrant herbs will soon be perfuming the air. Many of the plants alluded to last month are still in blossom, but Nature, always prolific at this time of the year, furnishes a number of fresh ones sufficiently ample for present discussion.

One of the most graceful objects to be seen in woods and on shady hedge banks is the male fern (*Lastrea Filix-Mas*, Presl.), with its elegant tufts of fronds grouped together in the form of a vase. It is easily distinguished by the kidney-shaped indusium, which covers each of the sori at the back of the frond. Ferns in other genera which have a somewhat similar appearance in the outline and division of the fronds have the indusium of a different shape. The only other species in the genus *Lastrea* with which it could be confounded is the sweet mountain fern, a much rarer plant, which visitors to the Conference at Plymouth will be able to find abundantly in the neighbourhood of Dartmoor. It is easily distinguished by the sweet odour which it gives off when rubbed with the hand, and by the fact that the pinnæ or leaflets decrease in size from the middle of the frond, and are continued down to the base of the stalk, whereas in the male fern they cease a short distance below the middle. Another difference which may be turned to practical account in the examination of the rhizome is that a transverse section of the leaf base is seen under a lens to be furnished with eight woody bundles, while the ferns which might be confounded with it contain only two. It is rather singular that the male fern, although found from Greenland to Natal, and from Japan to Peru, is absent from the Eastern United States.

The borage (*Borago officinalis*, L.) with its brilliant blue flowers bearing a considerable resemblance in size and shape to the flower of the potato, is now to be seen in waste places near villages, and very often it finds a place in the cottage garden. The scorpioid cymes and rough foliage characteristic of the family to which borage gives its name are well marked in this plant. The structure of the flower is rather peculiar. The petals, as in many other plants of the Boraginaceæ, are furnished at their base with a hollow "scale," formed by a small portion of the petal being inverted in the shape of a short tube, the opening into which may be seen by examining the back of the petal. At the back of each anther there is another black tongue-shaped scale, the object of which appears to be to cause the anthers to return to the shape of a cone immediately after they have been separated by the proboscis of the bee, the only insect, according to Lubbock, which is capable of getting at the honey-clad ovary. The stamens are mature before the stigma. The whole plant contains nitrate of potassium, and has been used in the form of infusion as a cooling drink.

The tall fennel (*Fœniculum vulgare*, Gærtn) with its finely cut leaves, capillary leaflets, and umbels of yellow flowers, may be found here and there on grassy slopes and hedge banks, chiefly on a calcareous soil. The sweet fennel (*F. dulce*, D. C.) which yields a larger, sweeter and more aromatic fruit, is distinguished by being a smaller plant, flowering earlier, and having stems compressed, not rounded at the base. It is questionable, however, whether it is anything more than a variety of the former plant, since the fruits diminish in size and change in shape every year, until after four or five years they are hardly to be distinguished from those of the wild fennel. Hanbury mentions, however, four commercial varieties distinguishable by shape, size, colour and flavour. The pericladium or leaf sheath is very well marked in the fennel plant.

Here and there in orchards and hedges near villages the tall elecampane (*Inula Helenium*, L.), with its large yellow composite flowers looking like a small sunflower, becomes conspicuous by reason of its rigid leaves, which in shape and size resemble large leaves of digitalis, for which, however, neither the plant nor the leaves are likely to be mistaken. The dried root is likely to be confounded with undecorticated marshmallow root, which in colour and size it resembles; its internal structure, however, is not white and fibrous, but is hard and has resinous dots, and its surface is not marked with transverse scars like that of the marshmallow root. Inulin, the carbohydrate which replaces starch in the roots of plants belonging to the compositæ, derives its name from this plant. Although formerly used as an aromatic tonic, it is now chiefly used as a cordial in veterinary medicine.

In marsh ditches near the sea, especially in the Eastern counties, the pretty flesh-coloured flowers of the marshmallow (*Althæa officinalis*, L.) are beginning to open. The plant has a more erect and shrubby habit than the common mallow, to which it bears a strong family likeness, and with which it is often confounded. The marshmallow has ovate, soft, velvety leaves, which are irregularly lobed and toothed (crenate) at the margin, and the calyx is furnished with an epicalyx, which has from six to twelve, or even more, teeth. In the common mallow (*Malva sylvestris*, L.) the leaves are reniform in outline, and have five triangular lobes and five principal radiating veins; they are crenately toothed, and the surface is slightly rough. The flowers are of a bluish lilac or mauve colour, and the epicalyx consists of three distinct bracts. In both plants the stamens are monadelphous, and the tube (androphore) formed by the united filaments has all the petals attached to its base, so that at first sight the corolla appears to be monopetalous. By examining the back of the corolla, however, the petals are seen to be quite distinct from each other. The anthers are one-celled, by which character malvaceous plants are distinguished from those of all other families which have monadelphous stamens. The pollen is covered with minute spines, and forms a very pretty microscopic object.

The chicory (*Cichorium Intybus*, L.), with its straggling rigid stems, studded with brilliant blue flowers, may now be met with by the roadside or in cornfields. The flowers, in shape and size, resemble those of the dandelion, but are sessile on the branches, and are often crowded together in twos and threes, only one in each axil being open at one time. The roasted and powdered root when mixed with coffee may be detected by its colouring cold water when dropped into it; or with greater certainty by its microscopical structure, which is described and figured in Dr. Hassall's work on the adulteration of food.

On chalky and limestone banks, the marjoram (*Origanum vulgare*, L.) may now be found abundantly, and is easily recognized by the odour of its leaves and its purplish tinted panicled inflorescence. This colour is due more to the bracts than to the flowers, the latter being sometimes almost white in colour. The inflorescence in most labiate plants is mixed, that is, the flowers in each tuft open from centre to circumference, while the whole floral axis opens from circumference to centre. In this plant, however, this arrangement is by no means obvious, for owing to the non-development of the lateral flowers in each axillary tuft the ultimate branches of the inflorescence appear to consist of small spikes opening in a centripetal manner. The oil of origanum of English commerce is not derived from this plant, but from the common thyme (*Thymus vulgaris*, L.). The cheaper kind, used in veterinary medicine, etc., is too often a mixture of oil of turpentine, oil of spike, oil of rosemary, and oil of thyme, the mixture being coloured with alkanet root.

Other labiate plants in blossom this month are the thyme, spearmint, and white horehound. Spearmint is easily distinguished from peppermint by its sessile leaves and tapering inflorescence, as well as by its odour. Peppermint has stalked leaves, and an obtuse spike-like inflorescence. Both of these mints, as well as pennyroyal (*Mentha Pulegium*, L.), will be in flower during the coming month. Pennyroyal has small leaves and slender prostrate stems, and the inflorescence consists of axillary verticillasters which are never clustered together at the top of the stems as in the peppermint and spearmint. It is not unfrequent in damp ditches on sandy commons or heaths. White horehound (*Marrubium vulgare*, L.), in this country is nowhere a common wild plant, but may occasionally be met with, especially on calcareous soil near the sea. It bears some resemblance to catmint (*Nepeta cataria*, L.) in general aspect, but is easily distinguished by its dense whorl-like axillary inflorescence of small white flowers and the ovate leaves tapering below, which as well as the whole plant have a whitish-green hue. In catmint the leaves are cordate at the base, and the flowers are arranged in terminal clusters, which is never the case with the white horehound.

Lactuca virosa, L., may also be found in flower during this month. It is, however, rather local, and is rarely found in the west beyond Somersetshire, or in Scotland beyond the north-eastern highlands. In general appearance it bears a strong resemblance to the common sowthistle (*Sonchus oleraceus*, L.), but is at once known by the very narrow, almost linear flowerheads (capitula), which any one who has seen the garden lettuce in flower would at once recognize as characteristic of the lettuce genus. The leaves abound in milky juice and turn blackish when bruised.

The vervain (*Verbena officinalis*, L.), although by no means so pretty a flower as its garden relatives, yet sometimes occurs in such profusion as to give a bluish tint to the meadow in which it grows. Its usual position is, however, amongst grass by the dusty roadside, or in stony places, and on this account it was formerly used as a remedy for stone. It appears to have been valued from the earliest times as a charm and to have been used in religious ceremonies. At the present day it is largely sold by herbalists as a tonic, and occasionally as a remedy for epilepsy. The plant is exceedingly bitter. It may easily be recognized by its square stem, opposite pinnatifid leaves, and long slender erect loose spike of small sessile pale blue flowers, and by the ovary not being divided into four distinct pieces, as in the Labiatæ, by which feature the Verbenaceæ are distinguished from that family.

Another very bitter plant, which is much used in domestic medicine in country districts, is the pretty little pink flowered centaury (*Erythræa Centaurium*, Pers.), a gentianaceous plant that may be found abundantly in sandy or calcareous pastures during the present month. The opposite leaves are lanceolate or elliptical, and the delicate pink blossoms are arranged in level topped corymbose cymes. It seems to be very sensitive to light, shutting up its flowers when a cloud obscures the sun for a time. The object of this phenomenon is not clear; it cannot be to protect the honey from being washed away by rain, for no nectar has yet been found in the blossoms. A white flowered variety may occasionally be met with. This plant is sometimes called the lesser centaury to distinguish it from the greater centaury (*Centaurea Centaurium*, L.) a thistle-like composite plant growing in Italy. The American centaury (*Sabbatia angularis*, L.) is very similar in appearance and properties to the lesser centaury, and also belongs to the Gentianaceæ. It is used in America as a tonic and vermifuge.

In the various botanical gardens a large number of plants are now in blossom, although few of them are hothouse plants. At Kew the only plant of medicinal interest in the economic house is the grass known under the singular name of Job's tears (*Coix Lachryma*), the greyish shining tear-shaped fruit of which is about the size of a pea. It is used in the East as a diuretic and tonic. In the open ground *Argemone mexicana*, L., displays its handsome yellow flowers, which are very like those of the yellow seaside poppy (*Glaucium luteum*, Sc.), but the leaves and fruit are very different from those of that plant. The leaves of the Mexican poppy are marked with white veins and bear considerable resemblance to those of the milk thistle (*Carduus marianus*, L.); the fruit is a quadrangular bristly capsule. The seeds are black and spherical and are about the size of turnip seed. The oil obtained from them has been recommended in cholera. The liquorice plants (*Glycyrrhiza glabra*, L., and *G. glandulifera*, W. K.) are now both in blossom at Kew. The former has pinnate leaves with larger leaflets, the terminal leaflet being stalked, and the flowers are of a pale blue colour. In the latter the leaflets are more narrowly lanceolate and the flowers are white and the terminal leaflet is sessile. The chief difference, however, lies in the pod, which is smooth in *G. glabra* and prickly in *G. glandulifera*. The leaves are seen under a lens to be covered with minute sessile glands, which look like tiny particles of clear liquid immersed in depressions of the surface of the leaf. The presence of these gives the leaves a curious sticky appearance that the touch does not confirm. The Russian liquorice of commerce is said to be chiefly derived from *G. glandulifera*. The root has a reddish tint and a scurfy surface which distinguish it from the smoother one of *G. glabra;* both are, however, frequently marked with transverse scars. Sometimes the underground stems are sold with the root; these have no transverse scars, have usually a distinct pith, are in straighter pieces, and have a less sweet taste.

The *Lathyrus sativus*, L., has remarkably pretty blue flowers, exactly the colour and about the size of the small blue butterflies so common in heathy places, and might well have suggested the name papilionaceous for the form of flower so named. The outer surface of the upper petal (standard) is of a pinkish colour. The seeds of this plant are used in India as food, but are worthy of notice here on account of having occasionally poisonous properties attributed to them.

Ecballium officinarum, with its coarse grey heart-shaped leaves, is not easily forgotten when once seen. The plant is monœcious, both male and female flowers being produced on separate stalks from each axil. There is usually only one pistillate flower, but the staminate flowers are often two or three or more in number. The female flower usually opens first, and the male flowers sometimes are not matured, so that unless carefully examined the plant might be supposed to be diœcious.

The scammony plant, *Convolvulus scammonia*, L., is now just coming into flower. The blossom is very similar in size and appearance to the common bindweed (*Convolvulus arvensis*, L.), but the pink stripes are only seen outside the corolla, the inner surface being white. The plant has also a twining rather than a trailing habit. Among the umbelliferæ, the coriander, carrot, hemlock, opopanax and several others will be found in good condition for examination. The coriander has umbels of pinkish flowers and is remarkable for having the lower leaves less finely divided and different in appearance from the upper ones, also for the disgusting odour of the leaves when bruised, which is exactly that of oxalate of amyl, and very different from the fragrant odour of the oil obtained from the fruit. Whether there be any relation between the oil of coriander and oxalate of amyl is a point for future investigators to decide. Those who examine this plant are advised to handle it tenderly, on account of the persistency of its odour. The same remark will apply to another plant now in blossom (*Chenopodium Vulvaria*, L.), whose strong odour of stinking fish, due to trimethylamine, can hardly be removed from the hands without soap and water. *Opopanax chironium*, Koch, has neither the odour nor taste of the gum resin opopanax, and certainly cannot be its botanical source.

Several American medicinal plants are now in blossom: *Apocynum androsæmifolium*, L., or bitter root, used as an alterative in chronic hepatic affections; *Apocynum cannabinum*, L., sometimes called Indian hemp in the United States, a diaphoretic and purgative; *Asclepias Cornuti*, Dec., common silkweed, and *Asclepias incarnata*, L., or swamp milk weed, the former used as an alterative and the latter as a vermifuge. *Asclepias Curassavica*, L., or West Indian ipecacuanha, is also in blossom in the economic house. All these species have the same curious structure of the flower. The five petals are bent backwards, almost hiding the five small sepals. The five stamens have their short filaments united into a pentagonal tube, and the anthers are almost free from each other, but are closely applied to the stigma, so that the only space for an insect to insert its proboscis is a narrow slit between each anther. The pollen is not powdery but agglomerated into two pollen masses, each of which occupies half of the anther and terminates in a small black gland. This gland does not unite the two pollen masses of each anther together, but is united to the gland belonging to the next anther, and these two united glands adhere slightly to the side of the stigma while the pollen remains in the anther cells, so that an insect in visiting the flower would draw out with it a double pollen mass, consisting of half the contents of two contiguous anthers. This may be easily confirmed by inserting the tip of a penknife between the curious boat-shaped processes, one of which is attached to the back of each anther, and drawing it upwards towards the top of the flower. Each of the boat-shaped processes has a short curved horn-like body projecting from its centre, the object of which is not very obvious, unless it be to act as a hook to catch the pollen masses carried by insects from one flower to another. The dull red flowers of the two silkweeds have a sweet honey-like odour. *Heuchera Americana* L., or alum root, so named on account of its astringent properties; *Actæa racemosa*, L. and *Veratrum viride* are also to be seen in blossom. Several abnormal umbelliferous plants are worth examination. *Bupleurum rotundifolium*, L., with perfoliate entire leaves and small umbels almost hidden by the large involucre; *Eryngium maritimum*, L., very like a thistle in appearance, but at once known from the compositæ by its anthers not being united; and *Hydrocotyle asiatica*, L., with its entire peltate leaves and minute umbels of very few almost sessile flowers. *Castanea vesca*, Gærtn, the Spanish chestnut, the leaves of which are useful in hooping cough, is now covered with its drooping catkins.

In the Chelsea Gardens may now be seen in blossom *Delphinium Staphysagria*, L.; *Colutea arborescens*, L., or bladder senna; *Melilotus cœrulea*, L., used in Switzerland to give the characteristic flavour to Schabzieger cheese; *Pimpinella anisum*, L.; *Carthamus tinctorius*, L.; *Lolium temulentum*, L.; *Anchusa tinctoria*, Lam.; *Marrubium vulgare*, L., and many others which want of space forbids us to notice at present. The pretty plumose pappus of the valerian may now be seen in all stages of development, and is well worth examination. At the Botanical Gardens at Regent's Park *Tanghinia venenifera*, Poir, is fully in blossom and *Jatropha Curcas*, L., or purging nut, is just opening its greenish flowers. The oil of the seeds of this plant is the kind which has been supposed to be used in India to adulterate croton oil.

At the drug sales we have seen but few novelties. Egyptian soap root (*Gypsophila Struthium*, L.), which contains a quantity of saponin, and is used by dyers and cleaners for removing grease from silk and other fabrics; oil of cedar wood, "Cuscus"; oil of ginger-grass, the oil which is used in India, etc., to adulterate otto of rose; hog tragacanth, better known to pharmaceutical students under the name of caramania gum, and which is used in Asia Minor for mixing with inferior tragacanth; these are a few of the articles which only occasionally appear in the lists. We have also noticed a peculiar kind of fluid galbanum about the consistence of fresh honey, having a decided taste of galbanum, but an odour which recalls that of turpentine and ammoniacum mixed. It was offered under the name of *Baridche*, and appears to correspond to one of the varieties of Persian galbanum, described by Hirschsohn (see *Pharm. Journal*, vol. vii., p. 371); a new kind of valerian root imported from Yokohama, in Japan, under the name of Kesso, probably the root of a species of a nearly allied genus. It has even a more powerful odour than the common valerian. The drug consists of a very small portion of root, with from six to twelve rather straight rootlets proceeding from it. The rootlets are about the size of those of valerian, but are of a brighter brown colour and have a soft spongy or scurfy surface. By this character and the absence of a well-marked rhizome it is easily distinguished from the English drug, to which, judging only by its odour it may prove to be superior.

Another root strongly resembling valerian in appearance, but nearly odourless, and having a more slender straggling rhizome, has recently been sold for white hellebore. The botanical and commercial sources of this root we have not as yet been able to ascertain. A nearly transparent kind of vermicelli, from Japan, is now also being offered for sale. It is probably made from rice. Dragon's-wood, a substance yielding a bright red colour to alcohol, is another article whose source is at present obscure. Santonin has recently figured in considerable quantity in the lists, but whether of home or foreign manufacture it is difficult to ascertain; remembering the suspected admixtures of strychnine with this principle which have recently been noticed it seems advisable that buyers should test its purity. At the present time it is worth while investigating whether the yellow colour of santonin which has been exposed to light is due to xanthopsin, a body which is supposed to possess poisonous properties.*

From the recent investigations concerning the active principles of calabar bean it would appear that the physostigmine of the English and the eserine of French commerce are identical bodies, and that an ethereal extract of the bean is far superior to an alcoholic one for medicinal purposes, since it will contain neither rubreserine nor the poisonous calabarine, which resembles strychnia in its effects. In other words, the physostigmine of commerce may be purified by treatment with ether which will only dissolve out the pure alkaloid.

In the July number of Bentley and Trimen's Medicinal plants four British species are figured, viz., *Sambucus nigra*, *Anthemis nobilis*, *Mentha Pulegium*, and *Lolium temulentum*. The fruit of *Arachis hypogœa* is probably known by sight to most people, but the curious development of the fruit described in the text will be known to but few beside good botanists. Only one other complete figure of this plant is extant, and that is in the Flora Brasiliensis. The other two plants figured are *Zea Mays*, and an Indian purgative, *Ipomœa Nil*.

Perhaps the most interesting contribution to pharmaceutical knowledge during the past month has been the results of the examination of the distribution of alkaloids in cinchona trees, by Mr. D. Howard. The experiments seem to point to the conclusion that light and oxygen are the two chief factors in the development of quinine and cinchonidine, while cinchonine and quinidine are produced in proportion as these are diminished. We thus get one step nearer to the knowledge of the circumstances under which quinine can be developed to the greatest extent. The relation which climate and soil bear to the successful growth of different species still, however, requires careful investigation.

* See before, p. 25.

The result that has followed the institution in this Journal of a special column for Dispensing Memoranda shows that dispensing difficulties are evidently of daily occurrence. To assist in their solution shall be our earnest endeavour, and we hope that our exertions in this direction will rather stimulate than supersede the efforts of those who are more immediately brought into contact with the difficulties themselves; when their own shoulders are at the wheel, the call for help shall be cheerfully responded to. The memoranda are here referred to in the order in which they appeared.

No. 1 is a prescription containing tinct. guaiaci. The mixture was sent out having the usual appearance of a guaiacum mixture, but it was alleged to have been made up incorrectly, and to have been since dispensed perfectly clear at a West-end establishment. This mixture cannot be other than an opaque mixture, with, as stated, the usual guaiacum appearance. As to its having been sent out perfectly clear by a West-end establishment, this "West-end establishment" is often a bugbear to dispensing houses of a smaller type, and it is recommended that in all cases of this description reference should at once be made to the house in question, that the mistake may be explained or the misrepresentation exposed.

No. 2. An attractive mixture is required from the ingredients contained in the prescription, and information is asked as to the order in which they should be mixed together to obtain the desired result. If the vin. ipecac. and chlorodyne be mixed together, and added to the tinct. tolu and tinct. opii ammon. previously mixed, and finally the glycerine, a homogeneous mixture will be formed that will not readily separate; and a still more satisfactory and permanent result is obtained by the addition of one drachm of mucilage; but whether the mixture be an attractive one or otherwise will mainly depend on the patient's view of a bottle of medicine which has to be taken in repeated doses.

No. 3. An explosive mixture from a prescription containing bismuthi subnit. and sodæ bicarb. That explosions do occur from this combination there has been abundant evidence in the subsequent correspondence, and there can be no doubt that it is immediately due to the evolution of carbonic acid, either through the presence of free nitric acid, resulting from imperfect washing of the bismuthi subnit., or decomposition of the bismuth salt in the presence of bicarbonate of soda. As the change does not take place with all samples of bismuth. subnit. it is very desirable that a sample of that from which the explosive mixture was made should be forwarded for examination; decomposition not being a necessary result of the combination of bismuth. subnit. and sodæ bicarb., most probably the explosion is due to an impure sample of the bismuth salt. It is possible for a mixture to be chemically incompatible, yet not medicinally so, and the *intention* of the prescriber should always guide the dispenser. If it be found that a mixture with these ingredients, now frequently prescribed, cannot be dispensed without the probability of an explosion, it is specially one of those instances where reference should be made to the prescriber, and his attention directed to the circumstance. At the same time, bismuth. carb., which is growing in favour, may very properly be suggested as a not incompatible alternative. Prescriptions, the ingredients of which are so incompatible that the combination results in medicinal destruction, should not be sent out without reference to the writer; the dictum that "there is no alternative but to follow the letter of the chemical incompatibilities as ordered" is a view of a dispenser's duties which his education and intelligence will call in question.

No. 5. Ung. sulph. hypochlor. crass. The formula for ung. sulph. hypochlor. is generally sent out on a printed form on each bottle of sulph. hypochlor., one drachm to the ounce of lard or simple cerate. By "crass." it is evidently intended that it should be of firm consistence. The sulph. hypochlor. is made by passing chlorine gas over sulphur, but it is questionable if a definite compound is formed. When freshly made it is very liable to burst the bottle, filling the atmosphere around it with chlorinetted and sulphurous vapours; on the other hand if it be kept any length of time the contents of the bottle will be found to be little else than sulphur. Formerly this ointment was often prescribed, but of late years it has not so frequently been met with. The hypochloride of sulphur is one of the subjects on the "blue" Conference list, demanding investigation, and it is to be hoped that at no distant period some member of that body may undertake the examination of this substance, although the subject may remain long in abeyance as being too large for small minds and too small for large ones.

No. 6. This chloric ether question is one that presents some difficulties. The spirit of chloroform was introduced into the British Pharmacopœia with the view of supplying an official solution of chloroform miscible with water, and superseding the non-official but very generally used chloric ether (1 in 10). At the present time most dispensing establishments use the official spirit of chloroform when either chloric ether or spirit of chloric ether is ordered in a prescription. A difficulty will sometimes occur in determining whether the prescription was written before the introduction of the British Pharmacopœia. If this be evident, clearly chloric ether (1 in 10) should be used, but if written subsequently to the issue of the B. P., the official spirit of chloroform takes its place. The rule which obtains in most of the leading dispensing establishments of the metropolis is that in prescriptions written since the issue of the B. P., whether æther. chloric. or spt. æther. chlor. be ordered, the one official preparation, spirit of chloroform, is used. It is true that there is an article known as spt. æther. chloric., which has for many years been made by a house in the north, and this is by some houses in London considered the correct thing to use when spt. æther. chlor. is ordered. But this view is exceptional. In retail it is now the practice to send out chloric æther when this article is asked for. Uniformity with regard to the use of spirit of chloroform when either æther. chlor. or spt. æther. chlor. is ordered in a mixture is most desirable, and dispensers should take every opportunity of bringing the subject under the notice of medical men, with the view of educating them to the uniform employment of the official spirit of chloroform of the British Pharmacopœia.

No. 8. This question is how to combine one ounce of carbolic acid (Calvert's No. 5), two drachms of bichloride of mercury, and eight ounces of water so that no separation should take place when further diluted. In this mixture a dark coloured, oily matter separates, but the addition of a little mucilage will emulsify it and no further separation will take place on the addition of water.

No. 9. Here mist. febrifuga is ordered in a prescription. It would, therefore, be proper to refer the prescription to the writer for particulars. If that be not feasible the dispenser must be guided by his own judgment, and he would do well to adhere to a simple saline composed of bicarbonate of potash and citric acid, in the proper proportions to form citrate of potash. This would be safe, and he could justify the course he had taken.

With regard to some of these questions it is desirable that leading houses should state their practice, and give their reasons for it, so that smaller establishments in their sense of duty and conscientious regard in carrying out the intentions of the prescriber may find that they are on "all fours" with those "West-end houses" so often referred to by correspondents, who are supposed to have the ear of the leading men in the medical profession.

Before closing, mention may be made of a substance that promises to be of interest to the pharmacist. Unguentum Petrolei is the name of a preparation very similar to vaseline, which is prepared by Messrs. Houghton and Co., of Philadelphia, and supplied in this country by Messrs. Allen and Hanbury. Like vaseline it consists of a mixture of heavy petroleum oils and contains a large amount of the paraffins and olefines of the formulæ $C_{16}H_{34}$ and $C_{16}H_{32}$. It melts at 38° C., and being non-oxidizable it forms a valuable lubricant for surgical instruments, etc. It is further recommended as a surgical dressing.

Also, Messrs. Mawson and Swan, of Newcastle, have recently brought out a new form of water-jet aspirator, which admits of use by attaching it to any pipe supplied by ordinary town water. In exhausting effect it is certainly better than most forms of aspirators hitherto employed, and it may be used with great advantage for the purposes of quick filtering, drying and evaporating *in vacuo*.

FORMULÆ FOR NEW MEDICAMENTS ADOPTED BY THE PARIS PHARMACEUTICAL SOCIETY.

(*Continued from page* 47.)

NARCEINE.—$C_{23}H_{29}NO_9$.

To obtain narceine, solution of ammonia is added to the uncrystallizable mother liquors left in the preparation of morphine and codeine by Gregory's process. A precipitate is thus formed, consisting of narcotine, thebaine and a resinous matter. To the filtered liquor is added solution of lead acetate, which produces a precipitate. The solution is again filtered, excess of lead removed by sulphuric acid, and the liquor neutralized by ammonia and evaporated at a gentle heat until a pellicle is produced on its surface. Upon cooling, a crystalline deposit is formed, which augments by standing. This mass is thrown upon a cloth, washed with cold water, and then boiled with a rather large quantity of water; upon cooling, silky crystals of narceine are deposited.

These are purified by treatment with animal charcoal, and again crystallizing from water. By a final treatment with ether any meconine the product might contain is removed.

Narceine appears under the form of delicate prismatic needles, slightly soluble in cold water and cold alcohol, more soluble in boiling water, very soluble in boiling alcohol, and nearly insoluble in pure sulphuric ether. It commences to fuse at 145°. Narceine does not reduce iodic acid and is not coloured blue by solutions of ferric salts. A 2 per cent. solution of iodine gives with narceine a fine blue colour.

Syrup of Narceine.—Water containing 6 grams of Hydrochloric Acid (sp. gr. 1·16) per litre, 100 grams; Narceine, 1 gram; Powdered White Sugar, 650 grams; Water, 250 grams. Dissolve the narceine with heat in the acidulated water, add the 250 grams of water and the sugar, and make a syrup by simple solution. The syrup will contain 10 centigrams of narceine per 100 grams, 2 centigrams in a tablespoonful (20 grams) and 5 milligrams in a teaspoonful (5 grams).

Pancreatine.

The pancreas, freed from all the foreign parts accompanying it, is suspended in twice its weight of water containing a small quantity of chloroform to prevent alteration. After digesting for a time, throw upon a filter; press the residue, and after filtering add the liquor obtained to the preceding. Evaporate rapidly in a current of air and in vessels exposing a large surface at a temperature not exceeding 45° C.

0·10 gram of pancreatine added to 5 grams of fibrine and 25 grams of water and heated for twelve hours to 50° C. produces complete solution and transformation. The filtered liquor should give scarcely any turbidity upon the addition of nitric acid. 0·10 gram of pancreatine added to 100 grams of paste containing 5 grams of starch gives a liquor filtering very readily and decolorizing four times its volume of Fehling's liquor.

Zinc Phosphide.—P_2Zn_3.

Fragments of pure distilled zinc are introduced into a tubulated stoneware retort, so as to occupy about one-fourth of its capacity; the retort is placed in an ordinary furnace, and a current of dry carbonic acid is passed into it through the neck. Over the tubulure is placed a crucible cover so as to close the orifice incompletely and allow the carbonic acid after traversing the retort to escape. When the zinc enters into ebullition, small fragments of previously dried phosphorus are successively thrown in through the tubulure, the cover being removed and returned after each addition to prevent loss of phosphorus. From time to time it is necessary to break the crust of phosphorus formed in order to expose a new layer of metal to the action of the phosphorus. The operation is terminated by increasing the heat strongly, a precaution that is indispensable in order to separate as completely as possible the zinc phosphide from the metallic button of nearly pure zinc which collects at the bottom of the retort. Further, the zinc phosphide should be reduced to a very fine powder and the fragments which resist the action of the pestle, however slightly, should be reserved for another operation. The product pulverizes the more readily in proportion as it approaches more closely the formula P_2Zn_3. In this state it resembles iron reduced by hydrygen, and only thus should it be used by pharmacists. It is completely soluble in hydrochloric acid.

Zinc phosphide crystallizes in right prisms with a rhombic base, and having a metallic lustre. Its sp. gr. is 4·72. It is very friable, the powder being slate-coloured; it keeps without alteration exposed to the air. Treated with dilute hydrochloric, sulphuric or tartaric acid, it is decomposed, giving rise to zinc salts and an evolution of phosphoretted hydrogen.

Zinc phosphide is administered under the form of pills containing 8 milligrams of the compound, representing 1 milligram of active phosphorus.

Picrotoxin.—$C_5H_6O_2$.

Powdered cocculus indicus is exhausted with two successive quantities of boiling alcohol. The liquors are submitted to distillation to remove the alcohol and the residue boiled with water. A little lead acetate is added to the boiling solution to remove colouring matter, and after rapid filtration excess of lead is removed by sulphuretted hydrogen. The cold liquid is again filtered and evaporated, when it deposits the greater part of the picrotoxin. This is purified by crystallization from boiling water.

This substance, which is not an alkaloid, occurs under the form of white prismatic needles, without odour, but having an insupportable bitter taste. It dissolves in 150 parts of cold water, 25 parts of boiling water, 3 parts of strong alcohol, and 2½ parts of ether. Sulphuric acid colours it saffron red. It does not give off ammonia when heated dry with the fixed alkalies, and leaves no residue upon incineration.

Alcoholic Extract of Podophyllum Peltatum.

The *podophyllum peltatum* (leaves and stalks) is employed under the form of a powder in doses of from 25 to 60 centigrams. By means of alcohol (90°) a yellowish green resinoid matter is extracted from it to which the name of "podophyllin" has been improperly given. To obtain it in a state of purity the alcoholic solution is precipitated with water. The dose in which this is employed is from 2 to 6 centigrams, rarely more.

Syrup of Polygala.

Polygala Root, 50 grams; Boiling Water, 350 grams; Sugar, 650 grams. Infuse during six hours, strain and press, filter, add sufficient water to make 350 grams of liquid, and dissolve the sugar in it by the aid of a covered water-bath.

Tincture of Polygala.

Polygala Root, 100 grams; Alcohol (60°), 500 grams. Bruise the polygala root, add the alcohol, macerate during ten days with occasional agitation, strain and press, and filter.

Syrup of Potassium Bromide.

Potassium Bromide, 50 grams; Distilled Water, 50 grams; Simple Syrup, 900 grams. Dissolve the potassium bromide in the distilled water with the aid of a gentle heat, and mix the simple syrup.

Each tablespoonful (20 grams) contains one gram of potassium bromide.

By substituting the syrup of bitter orange peel for simple syrup, the *sirop de bromure de potassium à l'écorce d'oranges amères* will be produced.

(*To be continued.*)

THE MANUFACTURE OF PALM OIL IN WESTERN AFRICA.

A very full and detailed account of the cultivation and produce of the oil palm (*Elaïs guineënsis*) on the West Coast of Africa, has recently been received at Kew, from the Colonial Office. From this report the following extract is quoted in the *Gardeners' Chronicle* for June 30:—

"Referring to cultivation, we are told that the ground is first well raked, and the ripe nuts which have been selected for sowing are scattered broadcast over the prepared ground and lightly covered with earth, or a number of nuts ranging from six to ten is deposited in one spot, at various distances, and covered with earth. The planting must be during the rainy season, as it requires a good quantity of water. When the young shoots have grown to about one foot in height they are carefully removed in the evening and transplanted at distances of at least fifteen feet from each other, and if planted during one season it is better to allow them to remain until the next before they are transplanted.

"The palm grows luxuriantly and bears more abundantly at the height of from ten to twelve feet in a damp semi-marshy soil, but where water does not, however, stand. In arid dry soil it becomes stumpy, and grows very slowly, and sometimes bears at four feet; but to cultivate the plant so as to ensure a proper growth, a development of a good number of spadices, large in size, with nuts or fruits well supplied with flesh, or what is technically called "fat nuts," the trees must be at a distance of at least twenty feet from one another, and well supplied with water. The supply of nuts fit for use is biennial, but the most abundant supply of commercial oil is obtained from nuts gathered during the rainy season.

"For the production of commercial palm oil, that is, oil for exportation, we are told that the spadices are cut down from the trees, and put in a heap outside in the air, where they are allowed to remain for a week or ten days, which causes the joints of the nuts to be weakened by the process of decomposition, and they are easily detached by simply beating them. The nuts or fruits are gathered together, and the husks that adhere to their base are removed either by the hand or by rubbing them together, and separated by throwing them in the air, and allowing a strong breeze to blow them away. A hole about four feet deep is dug in the earth, which is lined with plantain leaves, into which the nuts with the hard unyielding pulp are put and covered over, first with plantain leaves and then with palm leaves and earth. The nuts are allowed to remain for various periods—from three weeks to three months—until more or less decomposition has taken place, so that when removed the pulp is soft, and appears as if it had been thoroughly boiled. They are now put into a trough made by digging a hole four feet deep in the earth, and paving it below and around with rough stones. In some cases a portion of the nuts is boiled in iron or earthenware pots and then mixed with the unboiled portion before putting into the trough. They are now pounded with wooden pestles by several persons standing round the trough until the pulp is quite removed from the surface of the hard nut; the whole is removed from the trough, put into a heap, and the stones taken out, leaving the oily fibrous pulp, which is put into a pot with a small quantity of water under a good fire, and well stirred until the oil begins to melt out. The pulp is then removed and put into a rough net open at both ends, to which are attached two or three short sticks, by turning which in opposite directions the oil is squeezed out from the nets: it runs into a receiver or tub, leaving the fibre behind. The longer the oil-nuts remain underground the thicker the oil will be when made; the quality will also be inferior and the smell bad. On the other hand, the shorter time, within certain limits, the nuts are underground the more superior will be the quality of the oil made from them. This in a great measure will account for the difference in the quality of the oil shipped from different parts of the coast.

"The following is given as the method of manufacture of the oil for internal consumption: The spadices are kept in a hot place for three or four days, and the nuts are then taken out. A small quantity—from 3 lb. to 4 lb.—is made at a time. They are boiled in iron pots, then put into a wooden mortar and pounded with wooden pestles. The pulpy mass is then mixed with tepid water with the hand. The chaff is first removed, and afterwards the stones. The oil remains mixed with the water, which is passed through a sieve to remove the remaining chaff into a pot placed on the fire, and heated up to boiling point, and allowed to continue in that state whilst the oil floats up as a bright red substance. The water at this stage is being continually stirred, and the oil removed as it floats up until the whole is removed. The oil is now put into a pot and heated, to drive out any water that may remain. The nuts which have been subjected to the process already described in making oil are deprived of their external pulp, or old nuts picked up from under the palm trees are put in the sun for days, and even months, until they are perfectly dry. They are then broken between two stones, and the kernels obtained whole or in perfect condition and fit for exportation, and so form the commercial palm kernels. If they have not been perfectly dried the kernels break into pieces. The oil obtained from these kernels by the following process is called white kernel oil: They are put into wooden mortars and pounded very finely, then removed to a grinding-stone and ground into a homogeneous mass, which is put into cold water and stirred with the hand. The oil rises in white lumps on the surface of the water, which is collected and boiled. It is of a very light straw colour, and, when exposed to the sun and dew, becomes, after a time, perfectly white.

"Brown or black oil is thus obtained. The kernels are put into a pan and fried, the oil oozes out and is strained, the fried nuts are put into wooden mortars, pounded, and afterwards finely ground on a grinding-stone. The mass is thrown into a small quantity of boiling water and stirred continually, the oil rises, and is continually removed until it ceases to rise. The pulpy mass is removed from the fire and spread out in a large bowl and allowed to cool, after which it is again ground and put by until the cool of the day, when it is mixed with a little water to soften it. It is now beaten with the hand for some time until the oil comes out in white pellets. As soon as this is observed a large quantity of water is put into it, and the oil in some fatty substance floats on the top, which is skimmed off and boiled, and the pure oil obtained. As pointed out in the report, under the circumstances here detailed the exported kernels could not possibly retain their germinating powers, so that it would be impossible to raise plants from them."

CHEMISTRY OF THE BARKS OF THE OAK, WILLOW, AND ELM.*

BY E. JOHANSEN.

The investigation was undertaken with the view of ascertaining the nature of the different tannin-like substances contained in the barks of the oak, willow, and elm, and it was hoped, by isolating these and carefully examining their properties and the nature of their principal compounds, to ascertain whether they were analogous or even identical. By a long and elaborate process, the different tannins were separated from the three barks in something like a pure state.

Oak Tannin is a red-brown amorphous glistening body, easily soluble in alcohol, slightly soluble in ether, and forms an imperfectly clear solution in water. In its behaviour to litmus paper, metallic salts, and alkaloids, it is completely analogous to gallotannic acid. Dried at 110°, it lost 8·48 per cent. of water. On analysis, it gave 54·61 per cent. of carbon, 5·32 per cent. of hydrogen, and 40·07 per cent. of oxygen, agreeing approximately with Wagner's formula, $C_{14}H_{16}O_8$, which requires 53·85 per cent. of carbon, and 5·13 per cent. of hydrogen. It contains also 0·77 per cent. of nitrogen and 0·13 per cent. of ash.

Willow Tannin consists of a brown-red amorphous body, with a slightly astringent taste; easily soluble in alcohol, slightly soluble in ether, and forming a thick solution with water. With ferric salts it gives a deep black colour, turned violet-red by alkalies. It precipitates mercuric nitrate and chloride, and zinc and copper sulphates, as well as albumin, starch, and alkaloids. At

* From *Arch. Pharm.* [3], ix., 210–248. Reprinted from the *Journal of the Chemical Society*, June, 1877.

120° the willow tannin lost 10·10 per cent. of water, and on analysis gave 51·13 per cent. of carbon, 4·78 per cent. of hydrogen, and 44·09 per cent. of oxygen. It contains also 1·88 per cent. of nitrogen, and 1·63 per cent. of ash. Another specimen, prepared in a different manner, though possessing the same reactions as the last, contained 51·26 per cent. of carbon and 5·99 per cent. of hydrogen, besides having independently 0·44 per cent. of nitrogen, and 1·42 per cent. of ash.

Elm Tannin.—In appearance and solubility this variety resembles oak tannin. With ferric chloride, it gives a dirty-green precipitate, turned violet-red by sodium hydrate. With ferrous sulphate, it gives a pure-green precipitate. It precipitates lead and copper acetates, and zinc sulphate after some time. With zinc chloride, mercuric nitrate, calcium acetate, etc., it gave the usual reactions. At 110° elm tannin loses 3·32 per cent. of water, and, on analysis, gives 44·54 per cent. of carbon, 4·72 per cent. of hydrogen, and 50·71 per cent. of oxygen, besides containing 1·21 per cent. of ash.

The salts of these three tannin acids (quercitannic, salitannic, and ulmotannic) were next examined.

Lead Salts.—Quercitannate of lead is a chocolate-brown, amorphous mass, slightly soluble in water, insoluble in alcohol or ether. On heating it to 110°, it lost 9·66 per cent. of water; and on analysis it gave 22·85 per cent. of carbon, 1·47 per cent. of hydrogen, 9·14 per cent. of oxygen, and 36·54 per cent. of lead oxide. The salitannate of lead resembled the last body, and on drying at 120° lost 4·50 per cent. of water, and on analysis gave 22·53 per cent. of carbon, 1·35 per cent. of hydrogen, and 53·28 per cent. of lead oxide. By fractionally precipitating with a lead salt, both these acids gave salts of varying constitution. Ulmotannate of lead was greyer than the last body; and on analysis gave 21·36 per cent. of carbon, 1·51 per cent. of hydrogen, 10·32 per cent. of oxygen, and 66·81 per cent. of lead oxide.

Copper Salts.—Quercitannate of copper is a brown substance, insoluble in alcohol and ether, and sparingly soluble in water. At 110° it lost 12·23 per cent. of moisture, and on analysis gave 39·99 per cent. of carbon, 2·38 per cent. of hydrogen, 28·14 per cent. of oxygen, and 29·49 per cent. of copper oxide. Salitannate of copper forms a dark reddish-brown salt, which lost at 120° 12·4 per cent. of moisture; and on analysis gave 39·36 per cent. of carbon, 2·35 per cent. of hydrogen, 27·83 per cent. of oxygen, and 30·46 per cent. of copper oxide. Ulmotannate of copper is chocolate-brown, and after drying at 110° gave 39·68 per cent. of carbon, 1·93 per cent. of hydrogen, 17·98 per cent. of oxygen acid, and 40·41 per cent. of copper oxide.

Tin Salts.—Quercitannate of tin is a greenish-brown substance, insoluble in alcohol and ether, and only sparingly soluble in water. At 110° it loses 5·98 per cent. of moisture, and on analysis gave 36·32 per cent. of carbon, 2·56 per cent. of hydrogen, 20·69 per cent. of oxygen, and 40·43 per cent. of stannous oxide. The formula $C_{30}H_{26}O_{13}.3\,SnO$ agrees fairly with these numbers. Salitannate of tin is a chocolate-coloured body, which loses 7·18 per cent. of moisture at 120°, and on analysis gives 35·17 per cent. of carbon, 2·79 per cent. of hydrogen, 15·05 per cent. of oxygen, and 46·50 per cent. of stannous oxide. Ulmotannate of tin on drying at 110° gave 38·99 per cent. of carbon, 2·40 per cent. of hydrogen, 13·66 per cent. of oxygen, and 44·95 per cent. of stannous oxide.

When these different tannins were acted on by dilute acids in the usual manner, as Grabowski has already shown, the oak tannin yields an easily decomposed saccharide and a crystalline body. The amount of these bodies obtained varies with the strength of acid employed. On purification the saccharide is obtained as a brown substance, forming a dark-brown bitter syrup. Similar bodies were obtained from the willow tannin. On analysis the saccharide obtained from the willow tannin gave 36·94 per cent. of carbon, 5·19 per cent. of hydrogen, and 57·87 per cent. of oxygen. Elm tannin, on the contrary, yields no crystalline body, but only a saccharide resembling in every respect the last.

On fusing with potassium hydrate, the oak tannin yields, amongst other products, butyric acid amongst the volatile products, and protocatechuic acid from the residue. Willow tannin, similarly treated, yielded acetic and butyric acid amongst the volatile products, whilst the residue in the retort contained a body whose identity could not be satisfactorily made out. Elm tannin, treated in the same manner, yielded acetic and butyric acids among the volatile products, and oxyphenic acid in the residue.

SATURATION-TABLE OF SALICYLIC ACID.*

BY DR. H. HAGER.

Saturated or neutral solutions of solium salicylate may be prepared by the following table :—

5·0	of salicylic acid	require	3·25	sodium bicarbonate.
6·0	„	„	3·90	„ „
7·0	„	„	4·55	„ „
8·0	„	„	5·20	„ „
9·0	„	„	5·80	„ „
10·0	„	„	6·50	„ „

Or, to state it more correctly, the weight of salicylic acid, multiplied by 0·65, gives the weight of sodium bicarbonate necessary for saturation.

If it is desired to use crystallized sodium monocarbonate, or sal soda, the proportions will be as follows :—

5·0	of salicylic acid	require	5·2	of sodium carbonate.
6·0	„	„	6·3	„ „
7·0	„	„	7·3	„ „
8·0	„	„	8·3	„ „
9·0	„	„	9·4	„ „
10·0	„	„	10·4	„ „

Or, to state it more exactly, the weight of salicylic acid, multiplied with 1·04, gives the weight of sodium carbonate necessary for saturation.

NOTE ON GINGER.†

BY JOHN STENHOUSE, LL.D., F.R.S., AND CHARLES E. GROVES.

As the nature of the resinous substance contained in ginger, and to which its pungent character is due, has not as yet been investigated, it seemed possible that a careful examination of it might lead to interesting results. The few preliminary experiments we made, however, did not appear very promising.

The ground ginger, *Zingiber officinale*, from Cochin China, was extracted by boiling with alcohol and the solution evaporated after filtration. The viscid residue had a strong odour of ginger, and when heated in a current of steam yielded a small quantity of essential oil lighter than water. A portion of the extract was fused with three times it weight of soda, and the product neutralized with sulphuric acid, and extracted with ether in the usual way. The ethereal solution, on evaporation, left a mass of crystals impregnated with a dark coloured liquid ; these, after purification by pressure and two or three recrystallizations from water, were examined and proved to be protocatechuic acid. They gave the ordinary well-known reactions of protocatechuic acid, and fused at the same temperature. On heating them with excess of bromine in a sealed tube, carbonic anhydride and tetrabromopyrocatechin were formed.

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* From *New Remedies*, June, 1877.

† From the *Journal of the Chemical Society.*

The Pharmaceutical Journal.

SATURDAY, JULY 28, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

SUGAR IN THE BLOOD AND GLYCOSURIA.

DR. PAVY has recently communicated to the Royal Society two papers which have commanded a deal of space in medical literature, on a subject in relation to which he has been working for many years past. In our opinion, the results of this work seem to bear a very poor relation to the toil. That this is so may be gathered from what follows. Many years ago BERNARD and HENSEN discovered in the liver a kind of dextrin ($C_6H_{10}O_5$), elaborated as they concluded through a decomposition of albumin exerted by that organ, and eventually a theory called "the glycogenetic function of the liver" was developed. On this theory the liver first of all produces dextrin or glycogen, and this becomes sugar which, passing into the blood by way of the hepatic vein, there becomes oxidized in the circulation. The disease known as diabetes mellitus was therefore conjectured to consist in a lack of oxidizing power, so that the sugar is voided in the urine.

At first Dr. PAVY was one of the chief admirers of the theory to which we have alluded, but without entering further into the history of the matter it may be said that in course of time he changed his opinions, and from his later experiments (which were until quite recently of a purely physiological order), he was led to different conclusions. In these studies Dr. PAVY has investigated the causes of glycosuria, or artifical diabetes, and he explains its production when brought about through influences on the nervous system, as due to a vasomotor paralysis affecting the vessels of the chylo-poietic viscera, by which means the blood reaches the portal system without having been dearterialized.* Dr. PAVY was thus led to believe that glycosuria is the result of the presence in the arterial blood of a particular ferment capable of transforming the liver dextrine into sugar. He found that inspiration of carbonic oxide or oxygen gave rise to comparable results, but while by elaborate methods of research he thus attempted to lend weight to his conclusions, he virtually destroyed them, for if glycosuria be the result of the presence of a particular ferment to which oxygen gives rise in the blood, then carbonic oxide cannot give a like result; if it does, then Dr. PAVY's conclusions are wrong, and he himself has shown that the two gases behave similarly. Moreover, many years ago Dr. PAVY claimed to have demonstrated that temporary glycosuria could be induced by impeding respiration. Now unless he can show that under these conditions blood also reaches the liver in an arterial condition, what becomes of his conclusions which regard glycosuria as the particular resultant of an action brought about by arterial blood?

* *Proc. Roy. Soc.*, vol. xxiii., p. 539, and vol. xxiv., p. 51. Also criticism of these researches by C. T. Kingzett (*Chemical News*, vol. xxxii., p. 183).

To be brief, these researches have thrown but very little new light either upon the function of the liver or the disease known as diabetes. We are without a knowledge of its causes, and are not possessed of a rational treatment of the disease. The last two papers read by Dr. PAVY before the Royal Society, on the 14th and 21st ults., relate however to a method of determining sugar when present in the blood, and the application of this method in various cases.

The method virtually consists in properly preparing the blood by coagulation, filtration, and otherwise, and then boiling the solution with excess of potassio-tartrate of copper. The suboxide of copper thus obtained is oxidized by a few drops of peroxide of hydrogen, and the resulting cupric oxide dissolved in nitric acid. From the solution the copper is electrolytically deposited on a platinum spiral, and weighed. In all this we may say at once, there is nothing new. With every particular of the method chemists have long been acquainted, and all that Dr. PAVY can claim is the application of the method to his special objects, but even here he has been anticipated in some measure. However, the results he has obtained are as follows:—In parts per 1000, dogs' blood proved to contain, on an average, 0·787; sheep's blood gave 0·521 part; bullocks' blood an average of 0·543 part sugar per 1000.

Dr. PAVY contrasts these figures with some obtained by BERNARD, who has stated* that the lowest limit of sugar in the blood is 1 per 1000, and that normally it varies from 1 to 3 per 1000. But Dr. PAVY in criticizing BERNARD's results does not tell us whether these figures refer to human blood or not; and other physiological chemists have found sometimes as much as 2 per cent. of sugar in blood. He continues to show that between arterial and venous blood there is virtually no difference in the amount of sugar, whereas BERNARD has arrived at totally distinct conclusions. Both PAVY and BERNARD agree in the spontaneous change occurring in blood after death, which results in the disappearance of sugar; but as regards the other matters to which we have alluded, and wherein these physiologists disagree it is not easy to decide how far each is right or wrong, and further work of a strictly chemico-mathematical nature is required before this can be done.

* *Comptes Rendus*, June 19, 1876, p. 1409.

THE CONFERENCE MEETING.

The Local Secretary of the Conference is apprehensive that our remarks last week on the subject of lodging accommodation for those who attend the forthcoming meeting at Plymouth, may mislead intending visitors. We think this is scarcely possible, but in order to avoid any such result, we may state that though Mr. Clark has found the publication of a tariff of lodgings to be entirely out of the question, he is prepared to secure accommodation for those who apply to him at once with that object. At the same time he adds that there should not be any delay in doing so, and therefore we take this opportunity of impressing upon our readers the desirability of giving prompt attention to the advice of the Local Secretary, and not leaving their applications to the last few days before the meeting if they desire to avoid being awkwardly situated.

BILL TO AMEND THE SALE OF FOOD AND DRUGS ACT.

Quite at the fag end of the Parliamentary Session just as it has become an interesting question, which of the Bills before the legislature will meet the untoward fate of being included in the "slaughter of the innocents," a Bill to amend the Sale of Food and Drugs Act (1875) has been brought forward in the House of Commons. Leave to bring the Bill in was given to Mr. Isaac on Monday, and on Wednesday it was read a first time and ordered to be printed. At the hour of going to press, however, copies could not be obtained.

THE UTILITY OF LOCAL ASSOCIATIONS OF PHARMACISTS.

We are pleased to find that the chemists in country towns are becoming alive to the fact that it is greatly to their interest to form associations. We have received from the Lancaster and District Chemists' Association a List of Dispensing Prices which it appears to have adopted. We have no doubt the Hon. Secretary to this Association, Mr. Bagnall, would gladly forward a list and other information to gentlemen who are desirous of forming societies in other country towns.

DEATH OF DR. A. HUSEMANN.

We regret to announce the death, on the 17th inst., of Dr. August Husemann, of Coire, at the early age of 44 years. Dr. Husemann is perhaps best known in this country as the author, in conjuncture with his brother, of the valuable work, 'Die Pflanzenstoffe in chemischer, physiologischer, pharmacologischer und toxicologischer Hinsicht.'

We observe that Messrs. T. and H. Smith and Co., of Edinburgh and London, have received a diploma of honour and gold medal—the highest award bestowed—for chemical products, and a gold medal for essence of coffee and aërated waters, at the South African International Exhibition. In connection with the same exhibition, a gold medal has also been awarded to Mr. Hickisson, the proprietor of the Crystal Palace Marking Ink.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

July 12th, 1877.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Haselden, Linford, Martindale, Moss, Southall, Taylor, and Umney.

MAJOR EXAMINATION.

Twelve candidates were examined. *Three* failed. The following *nine* passed and were declared qualified to be registered as Pharmaceutical Chemists:—

Avison, David ....Wakefield.
Fletcher, Redfern.............. Newcastle-upon-Tyne.
Hardwick, Stewart ....Sleaford.
Holmes, Alfred John ....Preston.
Jones, Thomas ....Tenby.
Longman, John Ham ....Exeter.
Simpson, John ....Lewes.
Tuck, Walter Barber ....Eastbourne.
Wallis, Owen ....Hastings.

MINOR EXAMINATION.

Nineteen candidates were examined. *Seven* failed. The following *twelve* passed, and were declared qualified to be registered as Chemists and Druggists:—

Atkins, William Ralph ....Salisbury.
Balcombe, Charles ....Ticehurst.
Bartlett, Hubert ....London.
Cliff, James ....Wakefield.
Gosney, Charles Frederick ......Crewkerne.
Harding, Christmas ....Denbigh.
Kent, Edward ....London.
Lister, Charles Edward ....Manchester.
Middleton, Ambrose ....Nottingham.
Milton, Harry ....Exeter.
Wilkerson, Wallace .... Weymouth.
Williams, Alfred Joseph ....London.

July 13th, 1877.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Haselden, Linford, Martindale, Moss, Southall, Taylor, and Umney.

Dr. Greenhow was present on behalf of the Privy Council.

MAJOR EXAMINATION.

Eleven candidates were examined. *Nine* failed. The following *two* passed and were declared qualified to be registered as Pharmaceutical Chemists:—

Reece, Thomas ....Llandilo.
Snell, Charles Henry ....York.

MINOR EXAMINATION.

Sixteen candidates were examined. *Nine* failed. The following *seven* passed and were declared qualified to be registered as Chemists and Druggists:—

Foster, James Edward...........Bridgwater.
Jackson, Barnet Edward.........Heywood.
Newbery, Frank ....Lambeth.
Revell, John ....Plymouth.
Roe, Robert ....Lancaster.
Shone, Owen Ellis ....Lambeth.
Todd, Matthew James...........Sunderland.

MODIFIED EXAMINATION.

One candidate was examined and declared qualified to be registered as a Chemist—

Hickman, William ....Dorking.

July 18th, 1877.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Haselden, Linford, Martindale, Moss, Southall, Taylor, and Umney.

Dr. Greenhow was also present on behalf of the Privy Council.

MAJOR EXAMINATION.

Eight candidates were examined. *Four* failed. The following *four* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Burden, John Britten ....London.
Chapman, Joseph John ....Chertsey.
Giles, William Egbert ....Penydarran.
Griffiths, John Moore ....Birkenhead.

MINOR EXAMINATION.

Twenty-two candidates were examined. *Seven* failed. The following *fifteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Austin, Josiah ....Nechells, Birmingham.
Clarabut, Frank Stone............Folkestone.
Clarke, Ethelbert..................Maidstone.
Harpham, John ....Newark.
Jones, Thomas Bevan ....Merthyr.
Lacey, James ....Clifton.
Mead, Charles John...............Wimborne.
Moore, John William ....Northampton.
Nichols, Arthur Fitzroy ....Leicester.
Oldershaw, William ....Nottingham.
Ord, Septimus William ....Newcastle-on-Tyne.
Perry, John ....Congleton.
Saunders, James Warnes ......Hackney.
Slinger, Robert Thomas .... Manchester.
Warburton, William ....Haslingden.

July 19th, 1877.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Haselden, Linford, Martindale, Moss, Southall, Taylor, and Umney.

MAJOR EXAMINATION.

Seven candidates were examined. *Four* failed. The following *three* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Barron. William ....Leamington.
Maggs, Frederick Richard ......Yeovil.
Rickarby, Árthur George ......Bromley.

MINOR EXAMINATION.

Twenty-two candidates were examined. *Eleven* failed. The following *eleven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Abbott, George......................Liverpool.
Bishop, Henry ....Wisbeach.
Cobb, Joseph Septimus ....Doncaster.
Edwards, Charles Richard ......Harrow-on-the-Hill.
Inglis, William Keiller ....Ashton-under-Lyne.
Jenkins, Henry......................Salisbury.
King, William ....Southend.
Mills, William Hamer............Heywood.
Perkin, Thomas ....Stourbridge.
Walker, Charles Joseph ....London.
Wild, John ....Bury.

July 20th, 1877.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Haselden, Linford, Martindale, Moss, Southall, and Umney.

Dr. Greenhow was also present.

MINOR EXAMINATION.

Twenty-six candidates were examined. *Eighteen* failed. The following *eight* passed, and were declared qualified to be registered as Chemists and Druggists:—

James, Richard.....................Camborne.
Longbotham, Alonzo ....Ripon.
Riley, John Cowgill...............York.
Roberts, David ....Rhyl.
Singleton, Richard ....Preston.
Taylor, Henry Patrick............London.
Ward, John Septibo...............Stamford.
Wooldridge, Elijah ....Cradley Heath.

PRELIMINARY EXAMINATION.

The undermentioned certificates were received in lieu of the Society's examination:—

Certificates of the University of Cambridge.

Lewis, Albert Sturt ....London.
Littlewood, Harry ....Hempstead.

Certificate of the University of Oxford.

Watkins, William Richards ...Llanelly.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

The competitions for the two sets of prizes announced by the Council of the Bristol Pharmaceutical Association took place on June 22nd and 29th. Messrs Stoddart, Schacht and White kindly undertook the conduct of the examinations, and the report of these gentlemen was as follows:—

CHEMISTRY.

Seven candidates presented themselves. The questions were creditably answered by all, the three first returning exceedingly good papers.

1st prize, £3 3*s.* 0*d.*—Mr. Morris.
2nd prize, £2 2*s.* 0*d.*—Mr. R. S. Cuff.
Extra Prize, £1 1*s.* 0*d.*—Mr. W. Stroud.

BOTANY.

Four candidates came forward. The papers in this subject were not so good as the preceding, and only a second prize of £2 2*s.* was awarded to Mr. W. Stroud.

Candidates for the above were obliged to be associates of the Bristol Pharmaceutical Association, and must have attended a systematic course of instruction on the subject in which they competed.

HILLS PRIZES.

This competition was open to all associates of the Bristol Pharmaceutical Association who had not passed either the Minor or Modified examination at Bloomsbury Square. Four gentlemen presented themselves for this examination in materia medica and pharmacy, and the examiners report that very good and careful papers were returned.

1st prize, £3 3*s.* 0*d.*—Mr. T. W. Hall.
2nd prize, £2 2*s.* 0*d.*—Mr. W. Stroud.
3rd prize, £1 1*s.* 0*d.*—Mr. W. Powell.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

The annual meeting was held at the Great Western Hotel, on Friday 13th inst., Mr. Arblaster in the chair. The Committee presented their Annual Report and Balance Sheet.

The Chairman congratulated the Association upon its satisfactory financial condition, there being a balance of £30 1*s.* 8*d.* in the hands of the Treasurer.

The report of the Librarian was very satisfactory, the library having been more resorted to than in any previous year. Many additions to the library of useful and valuable works were reported, and several books had been very kindly presented by the authors. The Committee recommended a further grant of money for the purchase of books.

Mr. Stokes Dewson reported that the educational work of the past year showed very gratifying results, just over 30 students had presented themselves during the past year, of these 25 had passed; and in a recent examination in London out of seven candidates from this school six had passed; such results he considered placed the Birmingham school in the foremost rank among provincial schools and compared very favourably with results obtained in the metropolis. One student also obtained Queen's prize for botany. Considerable additions were recommended to the prizes (which are awarded after competitive examination only to those who have passed their pharmaceutical examinations), and a new prize of one guinea was offered by the President, Mr. W. Jones.

The result of the recent prize examinations was as follows:—

First prize (for men holding Minor qualification), 1876 Mr. R. Hollick.

First prize (for men holding Minor qualification), 1877 Mr. C. Arblaster.

Second prize (for men holding Minor qualification), 1877 Mr. S. Russon.

First prize* (for men having passed Preliminary), Mr. Prosser.

Second prize (for men having passed preliminary), Mr. Norman Smith.

The election of officers was then proceeded with. Mr. W. Jones, the President, was unanimously re-elected, Mr. F. S. Morris, the vice-president, Mr. Lucas, the treasurer, were also re-elected. Mr. Stokes Dewson was appointed honorary secretary, *vice* Mr. H. Sanderson, who from pressure of private business had resigned. The following gentlemen were elected to form the Committee:—Messrs. Alldridge, Arblaster, Barclay, Brassington, Brown, Chase, Churchill, Gibson, Green, Grieves, Healy, Holdsworth, Pare, Price, Sanderson, Snape, A. Southall, W. Southall, Wilkes, Wilcox, Whittles.

It was also reported that the soiree had been a success and a good balance of profit had been realized.

On the motion of Mr. Hayden, seconded by Mr. Pare, the meeting was adjourned until August 8th, when Mr. Churchill will read his paper upon the "Position and prospects of the trade." A cordial vote of thanks to the Chairman brought the meeting to a close.

Proceedings of Scientific Societies.

KING AND QUEEN'S COLLEGE OF PHYSICIANS.

THE INFLUENCE OF CHEMICAL CONSTITUTION ON PHYSIOLOGICAL ACTIVITY.†

BY J. EMERSON REYNOLDS, M.D., F.C.S.,

Professor of Chemistry, University of Dublin, etc.

Introduction.

(*Concluded from p. 57.*)

Another view of the matter may be taken, which is in accordance with the results of the experiments hitherto made. If we suppose that both the pyro- and meta-phosphates are attracted to and accumulated within an important organ by means of an essential basic constituent of that organ with which the phosphates form slightly soluble compounds, we are justified in expecting that the interference of the pyro-phosphate with the performance of the functions of the organ would be much greater than that of the meta-phosphate, because a given weight of basic substance is capable of attracting to a particular point precisely twice the weight of phosphorus in the form of pyro-phosphate as in that of meta-phosphate (see diagram); and the interference with the functions of an organ is, at least, likely to bear some simple and direct proportion to the amount of foreign matter accumulated within or around it. This view is evidently consistent with the fact that the pyro-phosphate is the most poisonous of the two compounds; but, I must add, that the explanation which I have just given in outline, is but one of many which might be suggested—my chief reason for having selected it for remark, in preference to others, being that it is the one which seems to be least open to objection on chemical grounds.

I will now refer to some corresponding experiments on vanadates made by Messrs. Priestly and Larmuth.

The admirable researches of Roscoe have recently made us acquainted with the true nature and relations of the compounds of the rare metal vanadium. It has been long known that vanadium yields several acids analogous to the phosphoric acids to which reference has been made. Roscoe has shown that a series of sodic vanadates exist corresponding to the sodic phosphates already referred to. Thus we have ortho-, pyro-, and meta-vanadates, which are the strict analogues of the ortho-, pyro-, and meta-phosphates, and their formulæ may be written in a similar manner, the pentad element phosphorus being replaced by vanadium (=V), which is also a pentad. In a very elaborate memoir Priestly has given the results of his researches on the physiological action of the vanadic salts, and has shown that they exert a strong irritant action on the gastro-intestinal mucous membrane, while they are also remarkably active as poisons of the spinal cord, the medulla oblongata, and the heart. The active vanadium compounds paralyse the vaso-motor centres; they do not affect the vagus as a cardiac inhibitory nerve, but exert some influence upon the intrinsic nervous mechanism of the heart.

Larmuth has compared the action of the three sodic vanadates, and shown that the ortho-vanadate exerts distinct poisonous action, though less than the pyro- and meta-vanadates; he has further proved that the pyro-vanadate is most energetic as a poison, while the meta-vanadate is intermediate in activity between the two extremes. The order of activity is, therefore, the same in the group of vanadates as in that of the phosphates. I may add that the analogous arsenates agree to some extent with the vanadates in being all poisonous, and in exhibiting differences in degree of activity.

In the cases just mentioned the observed differences in extent of action are probably to be explained by the aid of the considerations which guided us in dealing with the group of phosphates, for it is evident that the degree of activity is in the inverse ratio to the degree of satisfaction of the triad nucleus (PO''', VO''', or AsO''') with basic material, and seems to be dependent upon that condition. It will be noted, however, that the ortho-vanadate and the corresponding arsenate differ from the ortho-phosphate in exerting well-marked physiological action. It may be that this marked distinction is to be connected with the facility with which ortho-vanadates and arsenates can be reduced to lower states of oxidation by means which are wholly insufficient to effect the reduction of phosphates. The product of such reduction is necessarily an unsaturated compound, and is, therefore, capable of exerting physiological action. Rabuteau has shown that certain bodies easily suffer reduction or deoxidation during absorption—thus selenious acid (H_2SeO_3) and tellurous acid (H_2TeO_3), or selenites and tellurites, lose oxygen in transit, and are reduced to selenuretted hydrogen (H_2Se) and telluretted hydrogen (H_2Te) respectively.

* Prize value 30 shillings, given by Mr. R. T. Barclay.

† The substance of two lectures delivered before the King and Queen's College of Physicians in Ireland, being the first and second of the Annual Scientific Lectures for 1877. From the *Dublin Journal of Medical Science.*

But this reducing action is not very powerful, as shown by the fact that sulphurous acid (H_2SO_3) and sulphites do not suffer reduction, and in fact are oxidized into sulphuric acid and sulphates; and even the salt commonly called "hyposulphite of sodium" (Na_2SO_3S, or sodic thio-sulphate) resists reduction like the sulphites and the sulphates. Vanadates and arsenates seem to belong to the class of bodies which suffer partial reduction during absorption, or when in contact with insufficiently oxidized blood, while the phosphates do not suffer that change, so far as we know.

In view of these facts we have reason to think that the action of the vanadates and arsenates is complicated by secondary changes, whose effect is quite intelligible in altering physiological activity. It is, then, in the group of phosphates that we recognize most distinctly the influence of the degree of saturation or satisfaction of the grouping element upon the physiological activity of the compound.

If the reduction theory which we have just suggested be true, a saturated vanadium or arsenic compound which happened to be *difficult of reduction* ought, even if easily dissolved and absorbed, to be physiologically inactive. I cannot bring forward evidence affecting vanadium compounds as yet, but the researches of Bunsen have made us acquainted with a very remarkable compound of the much more energetic metal, arsenic, which fulfils our expectations completely. The substance referred to is called kakodylic acid, and is related to one of the arsenious acids in the following way:—

Arsenious Acid.	Kakodylic Acid.
$O{=}As{<}:$ $\vert$ OH	$O{=}As{<}^{CH_3}_{CH_3}$ $\vert$ OH

Arsenious acid we all know to be highly poisonous, but the easily soluble kakodylic acid, containing 54 per cent. of metallic arsenic, is inert.

Passing from this group of bodies, let me now briefly refer to the alcohols. We are acquainted with a large number of chemical compounds which are classed by chemists as alcohols, because they resemble more or less in chemical relations the body to which the term "alcohol" is commonly restricted; thus the syrupy liquid glycerine belongs to one division of the alcohols, and the white crystalline substance mannite, extracted from manna, belongs to another section. The bodies with whose action I now propose to deal differ from those just referred to in being very closely related to the chief member of the group—the common alcohol of wine—as well in their chemical relations as in their action upon the animal organism. Their names and formulæ are as follows:—

Monatomic Alcohols.

Methyl alcohol (wood spirit)	$-H$ $\vert$ CH_2 $\vert$ $-OH$
Ethyl alcohol (spirit of wine)	$-CH_3$ $\vert$ CH_2 $\vert$ $-OH$
Propyl alcohol	$-CH_2CH_3$ $\vert$ CH_2 $\vert$ $-OH$
Butyl alcohol	$-CH_2(CH_3)_2$ $\vert$ CH_2 $\vert$ $-OH$
Amyl alcohol	$-CH_2CH(CH_3)_2$ $\vert$ CH_2 $\vert$ $-OH$

All these alcohols, except the first of the series, are produced during the fermentation of grain spirit; but the three last-named occur in very small quantity, and are found in the poisonous "fusel oil" of new whiskey. The poisonous action of "fusel oil" is chiefly due to the presence of these higher alcohols.

These alcohols, or isomeric modifications of them, have been made the subject of numerous and interesting researches, conducted with a view to the comparison of their physiological action. The experiments which are of most direct interest to us in the present connection are those of Messrs. Dujardin-Beaumetz and Audigé, and of Dr. B. W. Richardson, of London. As the researches of Dr. Richardson on this subject are, no doubt, familiar to my hearers, I shall confine my remarks to the work of the French investigators.

Messrs. Beaumetz and Audigé have shown that the alcohols above named act most energetically when introduced into the stomach of an animal. By means of a series of experiments, which seem to have been conducted with care, they have arrived at the conclusion that the lethal dose of each alcohol per pound weight of animal is approximately—

42	grains of	ethylic	alcohol
33	„	propylic	„
13	„	butylic	„
5	„	amylic	„

It would appear, then, that the alcohols which have the most complex molecules are most energetic. Beaumetz has, however, still more recently shown that methyl alcohol (the lowest term of the series of compounds) is more poisonous than the alcohol of wine. With this important exception, the statement seems to be generally true.

Now, all these bodies are represented in the diagram as saturated compounds, and they are so; but they all contain one atom of hydrogen which is easily displaced by various radicles, so that under favourable conditions they are capable of acting as if they were unsatisfied though saturated. It is probable that the physiological activity exhibited by the lower members of the series—with the exception of methylic alcohol—is due to this cause, but it cannot be the sole cause, else we should expect all the members of the group to act with nearly equal energy; and Beaumetz and Audigé's results, cited above, as well as Richardson's, prove that the alcohols are not equally active. It is probable that the members of the series of more complex constitution not only act as I have just mentioned, but partially break up in the organism under the influence of oxygen or other agents, and afford as products of their decomposition more simple but unsaturated bodies, which then exert the marked effects of compounds of that class. As the number of carbon atoms in the molecule of the alcohol increases, the number of unsaturated bodies which a given weight can yield also increases; and it is, at any rate, a remarkable coincidence that there is a corresponding gain in physiological activity.

It is now necessary to turn for a moment to the first member of the group of alcohols—methylic alcohol—a body which is, according to Beaumetz, more poisonous weight for weight than the more complex alcohol of wine. If we admit the fact, the explanation of it is probably to be found in the circumstance that methyl alcohol can be much more readily broken up by oxidation than ethyl alcohol; and one of its products of oxidation is formic acid—a substance which, though seemingly inactive when directly introduced into the system, appears, according to the researches of Byasson, to be capable of producing very marked effects when formed within the organism, and so presented, as it were, in the nascent state.

Before leaving the group of alcohols, I may add that we are acquainted with isomeric propylic, butylic, and amylic alcohols, whose physiological effects yet require careful study.

If time permitted I might refer to other and highly interesting researches in support of our proposition—notably to those of Cahours and Jolyet on the action of substituted anilines, and of Dewar and M'Kendrick on the action of the pyridine bases, while the study of the action of chloral hydrate and its homologues, of formic and oxalic acids, and of many other bodies, could be shown to afford additional evidence—but I trust enough has been said to show that a strong experimental foundation exists for the statements made.

Before passing to the consideration of our next proposition, I may be permitted to digress so far as to point out that we can alone correctly compare the physiological activity of one element with that of another when we study compounds of similar chemical constitution. Thus sodic nitrate (meta-nitrate), meta-phosphate, meta-vanadate, and probably meta-arsenate, accord in composition with the general formula, $NaRO_3$, and are similarly constituted bodies. If otherwise suitable, their comparative study ought to afford us data for the determination of the relative physiological activity of the elements, nitrogen, phosphorus, vanadium, and arsenic, when in that particular form of combination. So far as experiments of this kind have been made with the four elements just named, it appears that nitrogen is lowest in the scale of activity; then follow phosphorus and vanadium, while the most energetic of all is arsenic. If we now compare the atomic weight of these elements, we find that the physiological activity increases with the atomic weight. Thus, the

Atomic weight of nitrogen is	. . .	14·0
,, ,, phosphorus	. . .	31·0
,, ,, vanadium	. . .	51·2
,, ,, arsenic	. . .	75·0

Considerations of this order led Rabuteau to state generally that the physiological activity of an element is directly proportional to its atomic weight. I need only to mention here, however, that "Rabuteau's law" is but partially true, even when we compare similarly constituted groups of active bodies, for when we thus compare some corresponding compounds of chlorine, bromine, and iodine, we find that chlorine (at. wt. 35·5) is more active than bromine (at. wt. 80), and bromine than iodine (at. wt. 127). In fact, if we substituted for "Rabuteau's law" the statement that the physiological activity of an element is in the inverse ratio to its attraction for oxygen, we should enunciate a "law" which seems to be, on the whole, open to fewer objections than Rabuteau's, but which is. nevertheless, governed by the question of constitution.

In this connection I might also refer to the interesting experiments of Blake, who sought to connect the physiological action with physical structure, and who asserts that isomorphous salts produce similar effects on the animal organism; and to the experiments of Dr. B. Wills Richardson on the comparative effects of the ordinary urea and the sulpho-urea which I discovered some years ago; but I must leave the detailed consideration of these cross-comparisons for another and more convenient time.

THIRD PROPOSITION.

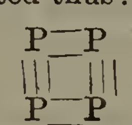
Our third proposition asserts "*that bodies which are unlike in composition, but which agree in being either actually or constructively unsaturated, and are alike in certain marked chemical relations, often agree in physiological action.*"

Few bodies differ from each other more than the element phosphorus from the well-known compound called pyrogallic acid, or pyrogallol; yet Personne asserts that they act in the same way in the animal organism, because they agree in one strongly-marked chemical character—namely, intense avidity for oxygen.

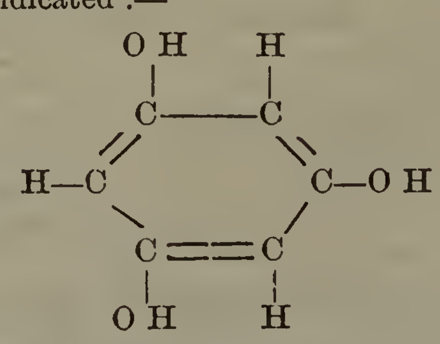
Personne believes that absorbed phorphorus poisons by abstracting oxygen from the blood, and that the death of an animal poisoned by phosphorus is really due to asphyxia. If this be a true explanation, argued M. Personne, any other body capable of absorbing oxygen with equal energy from the blood ought to resemble phosphorus in its action on the animal organism. Pyrogallic acid is such a body, especially when present in a slightly alkaline liquid; consequently Personne injected sixty grains of the pyrogallic acid, dissolved in a large quantity of water, into the stomach of a dog. Symptoms of poisoning were quickly developed, and closely resembled those caused by phosphorus. The animal died, and the morbid changes observed were precisely similar to those well known to be produced by phosphorus. A second dog received a dose of thirty grains of the pyrogallic acid, and the same train of symptoms and morbid appearances were observed.

Ordinary waxy phosphorus is, as is well known, a body which possesses most energetic properties, and is unsaturated, as all elements are. It is, moreover, one of the very few chemical elements which admits of being absorbed to any sensible extent in the elemental condition, owing to its solubility in, or miscibility with, fatty matter. Pyrogallol, or pyrogallic acid, has the composition represented by the formula $C_6H_3(OH)_3$, and the carbon atoms within its molecule are very far from having their "bonds" completely saturated by hydrogen and hydroxyl, as there are at least six "bonds" latent in the group, and some of these appear suddenly to become active when the compound is mixed with an alkali, although in the absence of alkali the pyrogallol does not exhibit any very energetic properties. The extreme avidity with which ordinary gaseous oxygen is absorbed by the alkaline pyrogallic solution seems to be due to the breaking up of the pyrogallol, under the influence of the alkali, into a number of unsaturated groups, which are as energetic in some at least of their chemical relations as phosphorus, for they even more readily combine with free oxygen. Personne's view—that any pyrogallol introduced into the slightly alkaline blood acts in a similar manner—was, therefore, not an unreasonable one.

The molecule of pentad phosphorus is chemically divisible into four parts, or atoms, unlike the free molecules of most other elements, which consist of two atoms only. The probable structure of the phosphorus molecule on this view is represented thus:—



The probable structure of the molecule of pyrogallol may be thus indicated:—



This mode of writing the formula enables us easily to understand how the body can break up symmetrically under the influence of alkali into unsaturated groups. While ready to accept Personne's experiments I am not disposed to follow him to his conclusion that phosphorus poisons by abstraction of oxygen because (1) the symptoms of phosphorus poisoning are not those common to asphyxiants; and (2) Curie and Vigier have shown that the quantity of phosphorus required to poison a rabbit weighing 3 kilogrammes (6·6 lbs.) is only sufficient to absorb one centigramme (·154 grain) of oxygen. The facts only warrant the statement contained in our proposition, as phosphorus and pyrogallol seem to agree in physiological action as well as in power of absorbing oxygen, though they are wholly unlike in composition; and it is highly probable that this resemblance in activity is due to the actually unsaturated condition of phosphorus, and to the constructively unsaturated condition of pyrogallol.

FOURTH PROPOSITION.

I have now to assert that "*the result of chemical addition to unsaturated molecules is either to destroy or to materially modify their physiological action.*"

In all the cases hitherto dealt with we have been able to connect physiological activity with the actual or constructive unsaturation of the molecule of the body considered. We now have to determine the effect of chemical addition to the unsaturated or unsatisfied groups, upon the physiological activity of the body experimented with, and to note how far this is altered. In all such experiments we have to take care that the elements or groups added shall produce a new compound which will not easily decompose in the animal organism.

Carbonic oxide is a good example of an unsaturated compound whose special action is destroyed by the addition of an atom of oxygen, so as to form the familiar carbon dioxide or "carbonic acid." In carbonic oxide the tetrad carbon atom has but two of its four "bonds" satisfied by diad oxygen; in the higher oxide all the bonds are engaged.

Carbonic oxide.	"Carbonic acid."
$:>C<>O$	$O<>C<>O$

The unsaturated carbonic oxide we know readily unites with the hæmoglobin of the blood to form Preyer's carbonic oxide-hæmoglobin—a body which, when once formed, very slowly undergoes change, even in presence of oxygen, and therefore neutralizes, for the time, a certain quantity of the great oxygen carrier of the blood, and interferes to a corresponding extent with the vital processes. If the amount of carbonic oxide compound formed is large, the absorption of oxygen by the blood can take place to a very limited extent, and death ensues. On the other hand, "carbonic acid"—the saturated compound—does not combine with hæmoglobin, and, when inhaled by an animal, prevents oxidation chiefly by excluding air, or by so diluting it as to render the oxygen supply insufficient for the amount of blood pumped through the lungs, and consequently favours the accumulation of effete products in the system.

The poisonous action of carbonic oxide is direct and consequent on the unsaturated condition of its molecule. The poisonous action of "carbonic acid" seems to be, in great part, traceable to a physical cause. The result of the chemical addition in this instance is, at any rate, to materially modify physiological action.

Bunsen's remarkable experiments on the kakodyl compounds, already alluded to, have shown that chemical addition of a certain kind ($2\ CH_3$) to an arsenious acid destroys the power of that well-known poison.

Again, Rabuteau states that cyanates are not poisonous. If we regard potassic cyanide as the analogue of a carbamine, as I have already pointed out, its relation to a cyanate may be thus shown:—

Potassic cyanide.	Potassic cyanate.
$:>\overset{\diagup K}{N}{=}C<:$	$:>\overset{\diagup K}{N}{=}C<O$

Thus by the addition of an atom of oxygen to potassic cyanide the salt loses its extraordinary physiological activity.

I may remind you of the experiments which have been previously dwelt upon, and which prove that sodic ortho-phosphate is inert, though the pyro- and meta-phosphates exhibit considerable physiological activity. I have pointed out that the two latter salts can easily be converted into the inactive ortho-phosphate by the addition of basic oxide; hence chemical addition in these as in the other cases mentioned destroys the physiological activity of the body so treated.

In most of the cases just cited in support of our proposition there is a seemingly total destruction of the physiological activity of each body consequent upon the complete satisfaction of the tendency to accumulate matter within the molecule. I shall now turn to the work of the distinguished pioneers of this branch of inquiry—Drs. Crum-Brown and Frazer, whose results place beyond question the fact that chemical addition to unsaturated compounds—notably to the vegetable alkaloids—can materially modify, but not necessarily destroy their physiological activity; but it must be borne in mind that in all those cases in which a certain residual effect has been observed we are unable to assert that all the "bonds" of the body treated have been fully satisfied. In fact, the argument from analogy rather leads us to the conclusion that the satisfaction is but partial.

The two well-known alkaloids, strychnia and brucia, are unsaturated bodies, for they both easily unite with methyl iodide or sulphate to form seemingly saturated compounds whose relation to the parent base may be thus represented in the cases of the iodides:—

Strychnia.	Iodide of methyl-strychnium.
$C_{21}H_{22}O_2N_2)<:$	$C_{21}H_{22}O_2N_2)\begin{matrix}\diagup CH_3\\ \diagdown I\end{matrix}$
Brucia.	Iodide of methyl-brucium.
$C_{23}H_{26}O_4N_2)<:$	$C_{23}H_{26}O_4N_2)\begin{matrix}\diagup CH_3\\ \diagdown I\end{matrix}$

The methylated derivatives of these and other alkaloids are not only easily prepared, but they possess the great advantage of being difficult of decomposition by the agents they are likely to meet in the animal organism. The comparative physiological experiments made by Drs. Crum-Brown and Frazer with strychnia and its methylated derivatives, conducted as they were, with consummate skill, have afforded the remarkable results which I can best state in the words of the distinguished investigators:—

"These experiments clearly prove that the methyl derivatives of strychnia possess a very different action from strychnia itself. In none of our experiments, not even in the fatal cases, were the symptoms those of strychnia-poisoning; no starts nor spasms occurred, nor did stimulation give evidence of the slightest increase of reflex excitability.

"In fact, a condition exactly the reverse of that produced by strychnia was produced by these compounds. In place of violent spasmodic contractions and muscular rigidity, the appearances were those of paralysis, with a perfectly flaccid condition of the muscles. The limbs of the animal first yielded, its head gradually sank until it rested on the table; by-and-by it lay in a perfectly relaxed condition, and when death occurred it was due to stoppage of the respiratory movements. In the autopsies further evidence was obtained to distinguish the effects of the methyl-strychnium compounds from those of strychnia. The heart was found acting with nearly its normal rapidity; the spinal motor nerves were either paralysed or nearly so; and in place of the almost immediate occurrence of *rigor mortis* that follows the action of strychnia, the muscles continued flaccid, contractile, and alkaline for many hours.

"These symptoms are sufficient to suggest a close resemblance between the action of the methyl derivatives of strychnia and that of curare (*wourali*)—a well known and elaborately studied poison. In a recent publication Professor Schroff, of Vienna, has indicated a resemblance of this kind between the nitrate of methyl-strychnium and curare. Both substances undoubtedly produce a condition of general paralysis; but the special characteristic of curare-poisoning is that this paralysis is the result of an impairment or destruction of the function of the peripheral terminations (end-organs) of the motor nerves. It is impossible to demonstrate such an action without undertaking experiments of a special character. We accordingly extended our research for the purpose of examining this question.

"The sciatic artery and vein were tied at the knee of a frog, and one-tenth of a grain of sulphate of methyl-strychnium, dissolved in distilled water, was injected under the skin of the back. Eight minutes afterwards the frog was lying in a perfectly flaccid state, and in ten minutes irritation of any portion of the skin produced energetic movements of the tied limb *below the points of ligature*, but nowhere else. The sciatic nerve of the untied limb was now exposed, and, on stimulating it with a weak interrupted galvanic current, movements occurred in the tied limb only; not the slightest effect occurred in any part to which the poison had access. At the same time the muscles were everywhere active, and freely contracted when directly stimulated. The sciatic nerve was then exposed in the tied limb *above the points of ligature*, and on stimulating it energetic movements occurred below the knee of that limb, and there only. The heart was at this time acting at the rate of fifty per minute.

"This experiment was repeated with one grain of iodide of methyl-strychnium, and the same general results were obtained. The evidence that was thus acquired in favour of an action on the peripheral terminations of the motor nerves was strengthened by a modification of this method of experiment.

"The right gastrocnemius muscle of a frog was carefully dissected from its connections, excepting that its origin and insertion, and the nerve-fibres entering it, were untouched, and that all its blood-vessels were ligatured. One tenth of a grain of sulphate of methyl-strychnium, dissolved in five minims of distilled water, was then injected under the skin of the back. Twenty minutes afterwards, the animal being in a perfectly relaxed and motionless condition, the two sciatic nerves were exposed. Galvanism of the left produced no movements of the left limb, while galvanism of the right produced energetic movements of the right limb, which were seen to be due solely to contraction of the right gastrocnemius muscle, the other muscle remaining motionless. At the same time direct stimulation by galvanism caused contractions as freely in the poisoned muscles as in the non-poisoned right gastrocnemius.

"In an experiment, in which iodide of methyl-strychnium was substituted for sulphate, the effects were the same. We have, therefore, demonstrated that the methyl-strychnium derivatives produce paralysis and death by destroying the function of the motor nerve end-organs, and that their mode of action is, therefore, identical with that of curare. This conclusion is an extremely curious and interesting one. It is difficult to imagine a more decided modification in the action of any substance than has been produced by the addition of iodide or sulphate of methyl to strychnia. The striking characteristic of strychnia-action is the great and uncontrollable activity of the muscular-system; that of curare, of iodide and sulphate of methyl-strychnium, and, as we shall presently see, of several other similarly modified poisons, is the flaccid and motionless condition caused by the impossibility of exciting muscular action through the nervous system. So opposite are their effects that physiologists look upon curare as a powerful counter agent to strychnia, while physicians have employed it with success in the treatment of strychnia poisoning and of tetanus. It is remarkable that by so simple a chemical process so thorough a change should be produced in physiological action."

The same line of experiment was adopted in the case of brucia, thebaia, codeia, and morphia, and with similar results. The convulsant action of morphia was destroyed by the addition of methyl iodide or sulphate to the group; and, strange to say, the alkaloid so modified did not produce hypnotic effects in man or other warm blooded animals.

The results afforded by atropia, however, possess even greater interest than those which I have just referred to. Atropia, unlike the other alkaloids, not only acts as a convulsant, but also on the peripheral terminations of the motor nerves, though in a minor degree. The new compound produced when the alkaloid is treated with methyl iodide—the iodide of methyl-atropium—does not act as a distinct convulsant on the animal organism; but the action of the alkaloid upon the motor nerves is greatly exalted by the addition, without interfering with the mydriatic action of atropia.

The general conclusions arrived at in the course of this highly important investigation were—

1. That the addition of methyl iodide or sulphate to the alkaloid molecule profoundly alters the physiological action of the body.

2. That the methyl derivatives of all the alkaloids act on the peripheral terminations of the motor nerves.

The first of these results is evidently of chief importance for our present purpose, as my aim in this portion of the lecture has been to show that the result of chemical addition to unsaturated molecules is to materially modify their physiological action.

We know so little of the chemical constitution of these alkaloids that we are unable to assert that the addition of a methyl compound fully saturates the molecule. But even if, strictly speaking, *saturated* by methyl iodide, the attractive powers of the components of the bodies are not necessarily fully *satisfied*—a distinction the value of which I endeavoured to point out in referring to the experiments with the sodic phosphates. The convulsant action of any of the alkaloids experimented with is unquestionably connected with the existence of two unsaturated "bonds" which tend strongly to attach the molecule to other matter. Save in the case of atropia, this power of attachment is so great that the widely different paralysing action scarcely comes into play until the molecule has been saturated with CH_3I. In atropia the paralysing action rises more nearly to the level of the convulsant, so that in that alkaloid we have, as it were, a polar condition.

The train of thought suggested by these considerations is highly attractive, but were we to pursue it we should probably be led beyond the bounds of legitimate scientific speculation. I must, therefore, rest content with having suggested a probable cause for the residual and distinct action of the alkaloidal groups after the saturation by methyl iodide or sulphate.

Conclusion.

The evidence adduced in support of the four propositions which I sought to establish in these lectures could have been largely supplemented, but I preferred to select some well marked cases for comment rather than to attempt to deal with the whole of this wide subject in the necessarily short time allotted to these discourses. I trust, however, that the observations made have sufficiently shown that the study of the chemical constitution of medicinal substances, and of bodies not yet used in therapeutics, should go hand-in-hand with the study of their physiological action, as the latter is evidently dependent to a great extent on the mode of grouping of the components of the molecules.

Having thus connected chemical constitution, rather than mere composition, with physiological activity, it is reasonable to expect that the effect produced by an active body within the organism can be explained on ordinary chemical principles. In dealing with several of the cases of physiologically active bodies I have shown that we can trace out to a certain small extent the probable *rôle* performed by some of the compounds within the organism; but our knowledge of the chemical changes involved in vital processes is as yet too limited to justify us in going far in this direction. I may, however, supplement any observations made under special heads by pointing out here that if we exclude from consideration those bodies which exert a local corrosive action on the gastrointestinal surface, and those which seem (like carbon dioxide) to act *chiefly* by quenching oxidation, the remaining substances which are chemically and physiologically active can directly or indirectly interfere with the production of nerve force in one or more of at least five different ways :—

1. By directly removing oxygen from the blood, and thus interfering with the ordinary processes of oxidation.
2. By uniting with hæmoglobin to form compounds analogous to carbonic-oxide-hæmoglobin, or to Ray Lankester's cyano-hæmoglobin, thus preventing the normal production of oxy-hæmoglobin.
3. By combining with effete material and increasing the difficulty of its removal by oxidation or otherwise.
4. By withdrawing from living tissue material essential to its vitality.
5. By chemically combining with living tissue and interfering with the performance of its proper function.

In concluding this section, and with it these lectures, permit me to express the hope that the outline I have endeavoured to give of some recent work on the borderland between chemistry and physiology, may serve to show that the progress of true therapeutics must, in the future, largely depend on the extension of our knowledge of the chemical changes involved in the so-called vital process.

Parliamentary and Law Proceedings.

Prosecution Under the Apothecaries Act.

At the Redruth County Court, on Tuesday, July 17, 1877, before Mr. M. Bere, Q.C., Judge, the case of the Master, Wardens and Society of the Art and Mystery of Apothecaries *v.* T. J. T. Corfield, of St. Day, was heard. Mr. G. A. Jenkins appeared for the plaintiff, Mr. W. T. Tresidder for the defendant, and Mr. G. T. Bray watched the case on behalf of the Redruth Medical Association.

Mr. Jenkins said the action was brought under the 55th George III., chap. 194, and the plaintiffs brought it against Mr. Corfield to recover a penalty of £20 for practising as an Apothecary, having no right to do so. The 14th section of the Act prohibited persons from practising without being duly examined and certified. The defendant was a chemist, carrying on business at St. Day, and for a long series of years he had been in the habit of visiting persons, taking diagnoses of their diseases, prescribing for them, supplying them with medicine, and practising as a licensed apothecary. It was of great importance that gentlemen who had pursued a course of study for many years and were properly licensed should not have their practice interfered with by persons not qualified to pursue the course which the plaintiffs said Mr. Corfield had pursued. He wished the same course could be taken in the legal profession, as they were poached upon a great deal by many persons who act as attorneys, but who should be prohibited from so doing. He was prepared to call six witnesses, to all of whom the defendant had acted in the capacity of an apothecary.

Mr. Tresidder said it would save time if before any evidence was called, he directed attention to the 30th section of the Act, which laid down that notice of action must be given twenty-one days before the action was brought, whereas he had received no notice of action.

Mr. Jenkins urged that there had been a correspondence with Mr. Tresidder on the subject.

Mr. Tresidder contended that that was insufficient, as no notice of action had been given.

His Honour held that the notice was imperative. The summons was issued on the 5th April, and the plaintiff must show that twenty-one days before that date notice was given.

Mr. Jenkins said that a letter on the subject was written to the defendant from the office in October, 1876. Mr. Upton, the clerk to the society, sent a notice.

Mr. Tresidder disputed that statement.

His Honour adjourned the case, but made no order as to costs in order to see upon what pretext the objection was raised.

Mr. Tresidder, after stating that there was an appeal from the Nottingham County Court shortly to be heard, in which a Mr. Shepperley had been mulct in the penalty, asked his Honour to postpone the case until the appeal had been heard.

His Honour, in assenting, said the cases were not quite analogous, as in the case referred to a policeman went into Mr. Shepperley's shop complaining of a sore throat, when defendant gave him some medicine, telling him to call again ; and that the judge held to be prescribing within the meaning of the Act.

Mr. Tresidder stated that a similar action was, on the 2nd and 3rd July, tried before the judge of the Birmingham County Court, in which His Honour had deferred judgment until after the appeal in Shepperley's case should have been argued.

The case was then further adjourned until the November Court.

Dispensing Memoranda.

We are constantly in receipt of requests for aid in over coming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be conidered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions. *See before, p. 66.*

[10]. Ext. Tarax. Liquid.—In reply to the question of S. I. W.—"Which preparation of taraxacum should be used when ext. tarax. liquid. is prescribed in a mixture—the old-fashioned treacly preparation made by dissolving extract of taraxacum in water, and adding a little spirit, the more elegant liquor tarax., or the succus?"—in my opinion the prescriber intends the liquefied extract, and not either the liquor or succus. If he did not he would certainly write liquor or succus as the case might be.

The rule in practice in one of the largest dispensing establishments, some years ago, was to use a liquefied extract, and I have myself ever since continued the usage. The extract of taraxacum of the present Pharmacopœia does not resemble the old-fashioned treacly preparation met with formerly, and obtained by boiling the crushed root and evaporating the decoction, but is the clarified juice of the roots evaporated, and possessing the characteristic odour and flavour of taraxacum in a vastly more concentrated state.

J. B. Barnes.

[11]. TINCT. FERRI PERCHLORIDI.—I have found a great deal of difficulty in making tinct. ferri perchlor., B. P., with liq. ferri perchlor. ; when made as directed in the B. P. it soon deposited ferri oxyd. I

therefore used one part water, and two parts sp. vini rect. for dilution, instead of sp. vini rect. three parts. This product does not deposit, but soon generates what appears to be chlorine gas, which darkens the tincture, and gives it a very strong smell rendering it unfit for use. Can any reader suggest a way for making it so that it will remain unimpaired?

A prescription was presented to me a few days since, as follows:—

℞. Tinct. Ferri Sesquichlor.
Acid. Nit. Hyd. dil. . . . . āā ℥vj.

and which I dispensed with t. ferri seschlor., P. L. It had been previously dispensed in London aad in a town in a Midland county. That dispensed at the latter had exploded, and burst the bottle. Evidently B. P. t. ferri perchlor. had been used and gas generated, which caused the explosion.

J. S. H.

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[12]. PILL COATING.—Can any reader inform me how pills may be coated with a preparation of liquorice, without heat, so as to give them a shiny black appearance?

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[13]. QUININE MIXTURE.—I shall feel obliged if you will kindly insert the following prescription among the dispensing queries. I want to know if it can be dispensed containing the quinine in solution. A similar one I have been told has been made up at one of the leading dispensing establishments in London, with a satisfactory result, I always find the quinine separate.

℞ Pot. Bicarb . . . . . . ℈ij
Pot. Iodid. . . . . . . ℈j
Quinæ Sulph. . . . . grs. xx
Spt. Ammon. Co. . . . . ʒiij
Aquæ. ad . . . . ℥viij
M. ft. Mist.

D. MORRIS.

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[14]. DISPENSING QUERY.—Can you inform me how the following prescriptions may be dispensed clear? The first has been sent out so.

℞ Quin. Ferro-Cit. . . . . . ʒj
Acid. Phos. Dil. . . . . . ʒij
Liq. Strychn. . . . . . . ʒj
Sp. Chlorof. . . . . ʒij
Aq. Dest. . . . . ad ℥vj
M.

℞ Sp. Ammon. Co. . . . . . ʒvj
Pot. Brom. . . . . ʒj
Ferri Quin. Cit. . . . . . ʒj
Tr. Aurant . . . . ʒss
Aq. ad . . . . ℥vj
M.

T. H. W.

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[15]. MIST. AMMONIACI CONC. Will anyone favour me with the formula for the above preparation, 1 to 7? W. H. R.

Obituary.

Notice has been received of the death of the following:—

On the 1st of July, 1877, Mr. Thomas George Rees, Chemist and Druggist, Red Lion Square, Stamford. Aged 43 years.

On the 11th of July, 1877, Mr. Aubrey Lum, Chemist and Druggist, Chesham, Bucks. Aged 73 years.

On the 12th of July, 1877, Mr. John Heaton, Chemist and Druggist, Colne, Lancs. Aged 66 years.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE WORD DISPENSER.

Sir,—I am not quite sure that I can agree with your correspondent, Mr. Langridge, as to the derivation of the word "dispenser." I have always thought that it came directly from the two Latin words "dis," asunder, or apart, and "pendo," to weigh. Penso is sometimes used instead of pendo. The meaning is therefore simply "a weigher apart." A dispenser of medicines is one who "weighs medicines asunder," or into portions, and this precisely expresses what an ordinary dispenser does. I think this is the "top and bottom" of the whole matter.

8, *The Strand, Torquay.* EDWARD SMITH.

ILLEGAL SALE OF POISONS.

Sir,—I am grateful for the energetic manner in which the Committee of the Trade Association is defending the rights and privileges of chemists and druggists, but I must demur to the course they are taking in pressing on the Council of the Pharmaceutical Society the discontinuance of the Secretary's warning letter in cases of infringement of the Pharmacy Act of 1868.

There is nothing very dignified in prosecuting by the dozen sellers of pennyworths of laudanum and red precipitate, and it would, in my judgment, be harsh and unfair, if not impolitic, to take legal proceedings without previous warning. I hope, therefore, the Council will continue to give the Secretary, in all first offences, a discretionary power, which I am sure he will exercise judiciously. I believe the cautionary letter has generally been effective, and I do not speak without some knowledge of the subject. At any rate we should, in the event of ulterior proceedings having to be taken, stand better with the court, by having sent such a letter.

Hull, July 24th, 1877. JAMES BAYNES.

"*Sebe.*"—We agree with you that the practice of prescribing medicines under names that are understood only by certain dispensers is open to serious objections, and we have given expression to this opinion on several occasions. With regard to the other statements in your letter, in their present form they are too indefinite for publication.

"*Pharmacist.*"—We do not think that the instance you quote substantiates your allegation that the questions for the Preliminary examination were too difficult; no less than four other subjects having been given, from which the candidate was at liberty to select one for his theme.

R. Modlen.—*Œnanthe silaifolia.* The Curator would be glad of two or three specimens with both root and fruit.

S. M. Seward.—Yes.

J. C. H.—(1) the answer to your question would depend upon the conditions under which the preparation is sold, especially as to whether or not it is recommended for the relief or cure of disease. (2) Your second question we do not quite understand.

"*Spes.*"—Place some odoriferous substance together with the paper in a closed box.

"*Finance.*"—(1) *Cryptogamme crispa;* (2) Too fragmentary to name; (3) *Polypodium vulgare,* var. *cambricum;* (4) *Lastrea Filix-mas, β Borreri;* (5) *L. Filix-mas, δ abbreviata;* (6) *Lastrea spinulosa;* (7) *Epichloe typhina.* Specimens to be named in the Journal should be addressed to the Editor, not to the Secretary.

F. C.—Your question should be addressed to the Editor of a medical journal.

T. P. B.—*Trifolium arvense.*

J. T. Fox.—(1) *Anthemis Cotula;* (2) May be *Carduus pratensis;* send larger specimens; (3) *Ranunculus flammula;* (4) *Sium angustifolium;* (5) Send larger specimen; (6) *Sparganium ramosum.*

"*Vincere.*"—(1) *Sium angustifolium;* (2) *Torilis Anthriscus;* (5) *Filago germanica;* (6) *Hypericum androsæmum;* (7) *Equisetum arvense.*

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Tresidder, Prof. Dymock, Mr. Rowe, Mr. Heanley, Colorado, J. S. H.

THE TURPENTINES AND RESINOUS PRODUCTS OF THE CONIFERÆ.

BY DR. JULIUS MOREL,

Professor of Chemistry in the Industrial School, Ghent.

(*Continued from page 23.*)

III.—COMMON TURPENTINE.

Synonyms.—E.: Crude Turpentine.—G.: Gemeiner Terpenthin.—F.: Térébenthine commune; Térébenthine de Bordeaux; Térébenthine de Pin maritime; Térébenthine de Boston or d'Amérique.

Botanical Origin.—The plants which yield the common turpentine may be divided into two groups, (1) those yielding the turpentine of Europe and (2) those yielding the turpentine of America.

(1) European turpentine is yielded by the *Pinus sylvestris* of Russia and Finland, by the *P. Laricio* of Austria and Corsica, by *P. maritima*, Poiret, of the Landes Department and the neighbourhood of Bordeaux.

(2) American turpentine is best known in France under the name of "Boston turpentine," because it is sent to Europe by the way of Boston. It comes from the United States, especially from Virginia and the Carolinas, where it is obtained from *Pinus australis*, Mich., and *P. tæda.*

Botanical Synonyms of Pinus maritima.

Pinus maritima altera, C. Bauh., Pin., 492; Duham., Arbr., ii. 125, t. 29.

Pinus sylvestris maritima, coniis firmiter ramis adhærentibus, J. Bauh., Hist., i. 345; Tourn., Inst., 586; Gerard, Fl. Gall. Prov., 546.

Pinus sylvestris β, L., Spec., 1418.

Pinus sylvestris, Mill., Dict., n. i.

Pinus pinaster, Sol. in Ait. Hort. Kew., ed. 1, iii. 367; Lamb., Pinet., éd. 2, i. 17, t. 3-10; Loud., Arbor., iv. 2213, f. 2100-2101; Encycl. of Trees, 961, f. 1781-1782; Ant., Conif., 18, t. 6, f. 1; Forb., Pinet. Wob., 29; Link. in Linnæa, xv. 498; Schonn., Ann. Sci. Nat., 3 sér., iii. 235; Endl., Syn. Conif., 168; Lindl. et. Gord., Journ. Hort. Soc., v. 217 (exclus. syn. *Massoniana*); Knight, Syn. Conif., 27.

Pinus maritima, Lamb., Dict., v. 337; DC., Fl. Fr., iii. 273; Duham., Arbr., ii., t. 29. n. 4; Loisel, Nouv. Duham., v. t. 72; Spach, Hist. Veg. Phan., xi. 382; De Chambr., Tr. Prat. Arb. Résin., 251, pl. ii. et pl. v. 1; Carr., Man. des Pl., iv. 355; Tr. Gén. Conif., 365; Gord., Pinet., 176 (excl. syn. Lamb); J. E. Nelson, Pinæ., 123.

? *Pinus Japonica*, Hort. Œlig.

Pinus Nepalensis, Royle ex Lindl. et Gord. l.c.

Pinus Syrtica, Thore, Promen. en Gascogne, 161.

Pinus Chimensis, Knight, ex Gord. Pinet.

Pinus Novæ Hollandiæ, Lodd.

Pinus Nova Zelandica, Hort.

Pinus Sancta Helenica, Loud. ex Gord. l.c.

Pinus neglecta, Low.

E.: Pinaster; Cluster Pine; Maritime Fir.—G.: Italienische Kiefer; Strandkiefer.—F.: Pin de Bordeaux; Pin des Landes; Pin maritime.

In France the maritime pine forms considerable forests (*pignadas* in Gascony), principally in the Landes department and along the sea coast to Mans; it reaches even to Brittany, but there it proceeds from artificial sowing. It is found on the shores of the Mediterranean, and in the mountainous regions of Corsica it attains an elevation of 1000 metres. It prefers particularly light silicious soils.

Botanical Synonyms of Pinus sylvestris.

Tæda, Plin., Hist. Nat., xvi. 19.

Pinaster vulgaris prior, Clus., Panon.

Pinaster sylvestris vulgaris Genevensis, J. Bauh., Hist., 1-2, 253.

Pinus sylvestris vulgaris, C. Bauh., Pinet., 491.

Pinus sylvestris, L., Spec., 1418 (excl. var.); Lamb., Pinet., ed. 2, i. t. 1; Rich., Conif.. t. 11; Loud., Arbor., iv. 2153, f. 2043-2044; Encycl. of Trees, 951, f. 1759-1760; Ant., Conif., 9, t. 4, f. 3; Schonn., Ann. Sc. Nat., 3 ser., iii. 331; Spach, Hist. Vég. Phan., xi. 376; DC., Fl. Fr., iii. 271; Desf., Hist. Arbr., ii. 610; De Chambr., Tr. Prat. des Arb. Résin., 142, pl. 1, f. 78 and pl. 5, f. 2; Endl., Syn. Conif., 171; Lindl. et Gord., Journ. Hort. Soc., v. 218; Knight, Syn. Conif., 26; Carr., Man. des Pl., iv. 355; Tr. Gén. Conif., 372; Gord., Pinet., 184 (excl. syn. Fitsch and Don).

Pinus sylvestris Genevensis, Hort.

Pinus sylvestris, α communis, Endl., Syn. Conif, 172; Carr., Tr. Gén. Conif., 372.

Pinus sylvestris Haguenensis, Loud., Encycl. of Trees, 952.

Pinus sylvestris squamosa, Bosc., Nouv. Cours. d'Agric., art. Pin.

Pinus sylvestris scariosa, Lodd.

E.: Scotch Pine; Scotch Fir.—G.: Gemeine Föhre; Weissföhre; Gemeine Fichte; Kiefer; Tanne, and 55 other names which are given in Haynes's 'Abbildung.'—F.: Pin d'Ecosse; Pin sauvage; Pin sylvestre; Pin de Horgenau; Pin de Genève; Pin rouge.

The habitat of the *Pinus sylvestre* ranges over a widely extended surface, but is rather restrained in altitude; the tree constitutes vast forests in the North of Europe, as far as Siberia. In France it is met with alone or mixed with the oak, birch or fir, in the plains and upon the lesser ranges of mountains; in the south, as for instance, in the Pyrenees, it does not make its appearance until an altitude of about 1200 metres is reached. The weight of the frost and snow that accumulates upon its long acicular leaves, and the fragility of its branches, exclude it from very elevated regions. Usually it occupies the zone immediately below that of the fir. It prefers silicious and fresh soils, but succeeds in dry ones.

In consequence of the very precocious development of a periderm in the interior of the liber layers, the bark of the *Pinus sylvestris* loses from its earliest years its epiderm, its suberous envelope, its green cellular envelope, and with this its reservoirs of turpentine. This periderm, composed of reddish cells with thin walls that rupture easily, is arranged in numerous laminae, concave outwardly, and separating the liber in flakes of a corresponding form. The cellular tissue of the liber thus divided, is transformed and grows into a brown, dry, and fragile suberous parenchyma, which being quickly driven outwards by the increasing formation of periderm, gives rise to a rhytidoma cracked in every direction, and especially in long scales, becoming with age of a considerable thickness at the foot of the tree. It is reddish-brown or grey-brown, according as the activity of the vegetation provokes a more or less rapid superficial scaling. In an old tree the formation of the bark is modified greatly for a dozen metres above the soil. The periderm is of organized very thin concentric continuous layers, and causes the unmodified liber to fall off in membranous flakes, resembling paper. The bark, therefore, does not thicken, but remains thin, smooth, shining, and of a clear red colour, which is brighter in proportion as the vegetation is more vigorous.

Botanical Synonyms of Pinus Laricio.

Pinaster, Plin., Hist. Nat., xvi. 17.

Pinus sylvestris, ε maritima, Ait., Hort. Kew, ed. 1 iii. 366.

Pinus Laricio, Poir, Dict., v. 339; Loisel, Nouv. Duham,

v. t. 6 and t. 71, f. 2; Lamb., Pinet., ed. 2, i. 9, t. 4; Forb., Pinet. Wob., 23; Loud., Arbor., iv. 2206, f. 2081-2084; Encycl. of Trees, 957, f. 1768-1769; DC., Fl. Fr. iii. 274; Desf., Hist. Arbr. ii. 611; Ant., Conif., 3, t. 2, f. 1-2; De Chambr.. Tr. Prat. Arbr. Resin., 245, pl. iii., f. 12-13 and pl. v. f. 6-7; Link., Linnæa, xv. 494; Schouw., Ann. Sc. Nat., 3, iii. 234; Spach., Hist. Vég. Phan., xi. 384: Endl., Syn. Conif., 27; Lindl. and Gord., Journ. Hort. Soc., xi. 384; Knight, Syn. Conif., 27; Carr., Man. des Pl., iv. 357; Tr. Gén. Conif., 384; Gord., Pinet., 168.

Pinus maritima, Ait., Hort. Kew, ed. 2, v. 315 (non Lamk. nec Lamb.).

Pinus Laricio Poiretiana, Hort.

Pinus Laricio Cebenensis, Hort. ex. Gord. l. c.

Pinus Laricio Corsica vel *Corsicana*, Hort.

Pinus Laricio altissima, Hort. alis.

Pinus nigricans, Hort.

E.: Corsican or Larch Pine.—G.: Schwarzfôhre.—F.: Laricis de Corse.

The Corsican larch pine is met with in mountainous regions, where it occupies a zone above that of the *Pinus maritima*. It commences to appear at an altitude of 1000 metres, and rises to 1700 metres, an elevation at which it exists only as a stunted bush. It seeks the argillaceous gravels that result from the disintegration and decomposition of granites, and attains its maximum growth when these are moderately fresh. Its growth is sometimes very rapid.

Botanical Synonyms of Pinus australis.

Pinus americana palustris, Hort. Angl.; Duham., Arbr., ii. 126.

Pinus palustris, Mill., Dict., n. 14; Soland. in Ait. Hort. Kew, ed. 3, 368; Duroi, Harbk., ed. Pott. ii. 66; Wangenh., Beitr., 78; Willd., Baumr., 270; Lamb., Pinet., ed. 4., i. 30, b. 21; Forb., Pinet. Wob., 59, t. 22; Ant., Conif., 23, t. 6, f. 2; Desf., Hist. Arbr., ii. 612; Link. in Linnæa, xv. 506.

Pinus australis, Mich. fil., Arbr. For., i. 62, t. 6; Sylv. North Amer., 60, t. 41; Loud., Arbor., iv. 2255, f. 2156-2160; Encyc. of Trees, 987, f. 1842-1845; Loisel, Nouv. Duham., v. 246, t. 75, f. 3; Spach., Hist. Vég. Phan. xi. 392; Endl., Syn. Conif., 165; Lindl. and Gord., Journ. Hort. Soc., v. 217; Knight, Syn. Conif., 30; Carr. Man. des Pl., iv. 353; Gord., Pinet., 187.

Pinus Georgica, Hort. ex Gord. l. c.

Pinus palmiensis, ex Gord. Pinet. Suppl., 63.

Pinus Palmieri, Manetti ex Gord. Suppl. l. c.

E.: In *America*, Long-leaved Pine, Yellow Pine, Pitch Pine and Broom Pine in the Southern States; Southern Pine and Red Pine in the Northern States; and Yellow Pine and Pitch Pine in the Middle States. In *England* and the *West Indies*, by the timber merchants, Georgia Pitch Pine.

This pine is found in Virginia and Florida, on the downs near the sea, and it is very common in certain parts of the Southern States, to which the name of "pine barrens" has therefore been given. In America the tree attains a height of 60 to 70 feet; in England it seldom exceeds 10 or 12 feet.

Botanical Synonyms of Pinus tæda.

Pinus Virginiæ tenuifolia, Plukn., Almag. 297.

Pinus foliis longissimis, Cold., Nov. Fl. in Act. Ups. 1743, No. 230.

Pinus foliis ternis, Gronow, Virgin., 152.

Pinus tæda, L., Spec., 1419; Willd., Baumr., 269; Lamb., Pinet., ed. 2, i. 26, t. 17-18; Loud., Arbor., iv. 2337, f. 2118-2122; Encycl. of Trees, 978, f. 1816-1819; Desf., Hist. Arb., ii. 612; Loisel, Nouv. Duham., v. 249, t. 75, f. 2; Forb., Pinet. Wob., 43, t. 14; Ant. Conif., 25, t. 7, f. 1; Link. in Linnæa, xv. 503; Mich. fil., Arb. For., i. 97, t. 9; Spach., Hist. Vég. Phan., xi. 391; Endl. Syn. Conif. 164; Lindl. and Gord., Journ. Hort. Soc., v. 217; Knight, Syn. Conif., 30; Carr., Man. des Pl., iv. 353; Tr. Gén. Conif., 344; Gord., Pinet., 210; J. E. Nelson, Pinæ., 136.

E.: In America, White Pine (in Virginia); Frankincense Pine; Loblolly Pine; Torch Pine, Oldfield Pine.—F.: Pin de l'Encens.

This pine inhabits the sandy and uncultivated spaces of Florida and Virginia, where it forms vast forests; it is met with also in North Carolina. It attains a height of 70 to 80 feet.

Extraction.—The process of extraction from the maritime pine is described in great detail by Mathieu ('Flore Forestière,' p. 353). In Gascony, and especially in the department of the Landes, the production of turpentine is sacrificed to that of the wood. When the tree has a circumference of about 1·20 metres at the base, the bark is roughly removed from the side which is to be attacked, and then thinned off with the axe, rendering it smooth and even; next with a special instrument the workman makes towards the foot a rectangular cut which lays bare the sap-wood, and which is generally 10 centimetres wide, and 3 centimetres high. Below this cut a small trough is scooped out in some salient part of the foot of the tree to collect the products. If this be not possible, a portable trough is placed there. Every week the incision is renewed by the removal of a thin shaving from its upper part, in such a manner that the height continually increases, whilst the width is preserved constant, or, better still, decreases, and the incision attains in five years an elevation of about 3 metres. It is then abandoned, and a second is commenced, which is managed in the same manner as the first, from which it is separated by a band of bark 5 to 6 centimetres, or more, wide. In this way, the entire circuit of the tree is made, taking care to carry each new cut a little higher than the preceding one. Next, the spaces between the cuts are attacked; these are widened so as to cover more or less the old wounds, and they are always cut after the same fashion. This operation, when well conducted, can extend over 150 years or more, especially if in the earlier period, whilst the pine is yet weak, a year's rest be given to it after each period of seven or eight years' working.

Sometimes, when the strength of the tree will allow of it, two cuts are made at the same time, one higher than the other. Finally, instead of making the cuts one by the side of another, they are also made opposite to each other, the new ones being cut in the centre of the interval between the oldest.

The method of working calculated to preserve the health of the tree, is called "*gemmage à vie.*" If, on the contrary, the pine has to be worked in a short period, no attempt is made to preserve it; it is cut upon all sides at once, and the height of the cuts is tripled in a single year; the pine is said then to be "*gemme à mort,*" or "*à pin perdu.*"

The working is carried on from May to the end of September, the turpentine flowing into the troughs, from which it is removed from time to time. A good workman can cut from two hundred to three hundred trees per day.

A vigorous pine, standing alone, will produce annually 20 to 40 kilograms of crude matter; when the trees are in masses the figure does not exceed 5 or 6 kilograms. The pines of the Gascony downs are in this respect more productive than any others; those of Provence do not give such satisfactory results.

The crude products are of three kinds: (1) soft turpentine, which is collected in the troughs; (2) galipot, the portion which solidifies in the cuttings, from which it is detached in pieces, bark débris being frequently mixed with it; (3) barras, which has to be scraped off, and is only an impure galipot, mixed with chips, fragments of bark, etc.

The best description for the *extraction of American turpentine* is given by Flückiger and Hanbury.* It is in North Carolina that the extraction is principally carried on.

"In the winter, from November to March, the negroes in a *turpentine orchard*, as the district of forest to be worked is called, are occupied in making in the trunks of the trees cavities which are technically known as *boxes*. For this purpose a long narrow axe is used, and some skill is required to wield it properly. The boxes are made from 6 to 12 inches above the ground, and are shaped like a distended waistcoat pocket, the bottom being about 4 inches below the lower lip, and 8 or 10 below the upper. On a tree of medium size, a box should be made to hold a quart. The less the axe approaches the centre of the tree the better, as vitality is the less endangered. An expert workman will make a box in less than ten minutes. From one to four boxes are made in each tree, a few inches of bark being left between them. The greater number of trees from which turpentine is now obtained are from 12 to 18 inches in diameter, and have three boxes each.

"The boxes having been made, the bark and a little of the wood immediately beneath it, which are above the box, are *hacked*, and from this excoriation, the sap begins to flow about the middle of March, gradually filling the box. Each tree requires to be freshly hacked every eight or ten days, a very slight wound above the last being all that is needed. The hacking is carried on year after year, until it reaches 12 to 19 feet or more, ladders being used.

"The turpentine, which is called *dip*, is removed from the boxes by a spoon or ladle of peculiar form, and collected into barrels, which are made on the spot, and are of very rude construction. The first year's flow of a new tree, having but a small surface to traverse before it reaches the box, is of special goodness, and is termed *virgin dip*.

"The turpentine which concretes upon the trunk is occasionally scraped off and barrelled by itself, and is known in the market as *scrape*, or by the English druggists as *common frankincense* or *gum thus*."

The authors justly remark that the collection of turpentine in the Departments of the Landes and the Girond, in the south-west of France, is performed in a more rational manner than in America, inasmuch as the plan of making deep cavities in the tree for the purpose of receiving the resin is avoided by the simple expedient of placing a suitable vessel beneath the lowest incision.

Contrary to that which has been observed in the case of Strassburg turpentine, the resiniferous ducts are met with in this plant more abundantly in the external layer of the wood than in the bark, and this explains why it is that there is seldom any exudation of the resin from the plant, and also why it is necessary to incise both the bark and the wood in the extraction of this turpentine.

Before sending the turpentine into commerce it is purified by melting it in a boiler, and afterwards passing it through filters of straw or metallic gauze, or exposing it to the heat of the sun in a wooden box in which small troughs are cut so as to catch the impurities whilst the liquefied turpentine runs off into a recipient placed underneath. The latter process is preferable, because by it only an insignificant loss of volatile oil takes place.

Characters.—The characters of common turpentine differ according to the variety.

* 'Pharmacographia,' p. 546.

The variety known as *Bordeaux* is, when fresh, liquid and transparent; by contact with air it becomes opaque, whitish and semi-solid. That of commerce has the consistence of honey, is granular, and has a milky turbidity. When allowed to stand it separates into two layers, the upper being semi-fluid, transparent, and more or less coloured, whilst the lower is resinoid and has a crystalline appearance. Its odour is strong, disagreeable and very characteristic; its taste is acrid, bitter and nauseous. It is the most siccative of all the turpentines, a thin layer solidifying in twenty-four hours. This solidification is still more prompt in the presence of calcined magnesia; one twenty-eighth part being sufficient to give it a pilular consistence. Its density is variable, but always inferior to that of water. This turpentine dissolves completely in alcohol, ether, fixed and volatile oils and carbon bisulphide. Distilled with water it gives about 25 per cent. of volatile oil. Upon polarized light its action is lævogyre.

The variety known as *German* is met with in commerce of a thick consistence, dirty white, turbid and granular; its odour and taste are very disagreeable. It dissolves completely in the same solvents as dissolve Bordeaux turpentine.

The *American* or *Boston* turpentine has also the consistence of thin honey, but it is yellowish and slightly opaque, becoming transparent by contact with the air. Its odour is agreeable and its taste is acrid and bitter. When kept for a long time in a flask it separates into two layers, the upper of which is clear and slightly fluorescent, whilst the lower one is slightly turbid and granular. A portion of the latter layer examined under the microscope presents a mass of small elliptical crystals characteristic of abietic acid. If this turpentine be heated the crystals pass into solution. The turpentines of Bordeaux and Germany present the same microscopic characters.

Composition.—The proportion of essential oil contained in the common turpentines varies between 15 and 30 per cent. This is always mixed, as will be afterwards shown, with a certain quantity of another oxygenated volatile body. The turpentine from the *Pinus Laricis* of Austria gives about 30 per cent. of essential oil to 70 per cent. of colophony or resin.

Uses.—The common turpentines are very little employed in pharmacy; their disagreeable odour and taste have compelled their abandonment, although they partake of the same properties as the other turpentines. They are still, however, used in the veterinary art. For industrial purposes they are used in the preparation of artificial resinous products (tar, colophony, pitch) and spirit of turpentine.

(To be continued.)

ADULTERATED SULPHATE OF MORPHIA.

BY D. B. DOTT.

I lately examined a sample of morphia sulphate (offered in the English market), which was adulterated to such a scandalous extent, that, in the interests both of the trade and the general public, I think the results of the examination should be made known.

This compound contained 34·63 per cent. of anhydrous sodium sulphate, leaving only 65·37 per cent. of morphia sulphate. The morphia was also determined directly and found to be equivalent to the above proportion of sulphate.

It is needless for me to enlarge on the necessity of procuring these important preparations in a state of perfect purity; but it is obviously advisable for druggists to be on their guard when buying morphia salts.

NOTE ON DIALYSED IRON.*

BY JOHN M. MAISCH.

Dialysed iron, which will doubtless become one of the most valuable ferruginous medicinal agents, has been recently introduced into the United States, under various names. Some claiming it to be a solution of *oxide of iron* in water, it was, and is still frequently called in Europe, *ferrum oxydatum dialysatum;* but like the very similar preparation, *ferrum oxydatum saccharatum*, which has been made officinal in several European pharmacopœias (*Am. Journ. Pharm.*, 1873, p. 161; 1874, p. 559), it is nothing more nor less than a very basic oxychloride of iron. To prevent erroneous conceptions concerning its composition gaining a foothold, a brief review of the earlier literature on the subject will not be out of place.

The first paper on this subject deserving notice is one by John M. Ordway, entitled "Examination of the Soluble Basic Sesquisalts," which was published in the *Am. Journal of Science and Arts*, 2nd ser., xxvi., p. 197 (1858), and in which the following language is used: "Time is a very important element in the production of the highly basic compounds. One may easily be deceived as to when the hydrate ceases to be dissolved, and may set down as opaque that, which by longer digestion becomes quite transparent. By successive steps we get pretty easily as far as $Fe_2Cl_6,11Fe_2O_3$, and in the course of several weeks I have gone as high as $Fe_2Cl_6, 23Fe_2O_3$."

The next important paper is by Béchamp (1859), published in *Annales de Chimie et de Physique*, 3rd ser., lvii., 296, which in the main corroborates the statements of Ordway, but gives the most basic compound obtained $Fe_2Cl_6,20Fe_2O_3$. In both cases the solutions of the normal salt were digested with ferric hydrate.

Th. Graham's celebrated essay on the diffusion of liquids ('Phil. Trans.,' 1861, 183) announces the following results: "If recently precipitated ferric hydrate or carbonate of ammonium is added to an aqueous solution of ferric chloride, as long as the precipitates are redissolved, and if the dark-red solution thus obtained, containing from 4 to 5 per cent. of solid matter, is subjected to dialysis, mainly muriatic acid will pass through the septum upon which, after 19 days, remains a red liquid containing for 98·5 parts of oxide 1·5 part of muriatic acid. It remains liquid for 20 days and then gelatinizes, separating ferric hydrate. A similar solution of colloidal ferric hydrate may be obtained by dialysis of ferric acetate, and contains 6 parts of acetic acid to 94 parts of erric oxide."

Calculating Graham's results as an oxychloride, the formula Fe_2Cl_6, $95Fe_2O_3$ would be obtained, which seems to be hardly probable. At the same time, it must be remembered, that none of the so-called soluble oxide of iron has as yet been obtained free from acid. Graham's figures, I believe, are the lowest thus far observed, and the solution was not permanent, but gelatinized spontaneously. It must therefore be granted that any permanent solution of so-called soluble oxide of iron must contain notable quantities of acid; and within the past year such has been proven by Hager to be the case for several European preparations sold as oxide of iron.

The behaviour of the solutions is quite curious and apt to mislead, unless care be taken to arrive at correct results. They will retain their clearness on boiling, ary miscible with alcohol, glycerin, syrup, etc., but readil yield precipitates on the addition of acids not in excess, or of saline solutions, the precipitates disappearing again on diluting with distilled water. Tannin added in small quantities darkens the solution somewhat, and on filtering leaves but little matter in the funnel; on using a stronger solution of tannin a well diffused gelatinous precipitate takes place, having a deep brown, but not a black colour, and the filtrate is colourless. Solution of nitrate of silver added in small quantity does not disturb the transparency of the liquid; on adding more of the former a gelatinous *brown* precipitate takes place, and the colourless filtrate is free from iron, but the addition of distilled water causes the precipitate to dissolve again. Apparently, therefore, the solution is free from chloride; but on adding first a slight excess of ammonia, filtering from the ferric hydrate, acidulating with nitric acid and then testing with nitrate of silver, a white precipitate of chloride of silver is formed. All these reactions as well as the slight astringent, not inky taste, and the intense brown-red colour have been observed by the investigators named above, and they characterize also the commercial products. A sample recently handed to us, and said to contain no, or only traces of, chlorine, yielded when treated as above abundant evidence of its presence.

Physicians and pharmacists should, therefore, bear in mind that there is *no soluble oxide of iron*, but what is sold as such, be it imported or made in this country, is *very basic oxychloride of iron.* This being the case, the question naturally presents itself whether such a solution cannot be obtained by saturating a solution of ferric chloride with hydrate of iron. That question is easily answered if the behaviour to saline solutions is taken into consideration and the fact is remembered that, when solutions of ferric salts are precipitated by alkalies, the ferric hydrate will invariably retain small quantities of the precipitant, which cannot be removed by washing with water. These saline impurities, minute as they may be, are sufficient to prevent the formation of the very basic oxychloride, or if formed it becomes insoluble in the liquid and nothing but dialysis or considerable dilution with distilled water can dissolve it again. To obtain it of the maximum strength indicated by Graham (5 per cent.) and also adopted by the Pharmaceutical Society of Paris (see before page 27), dialysis appears to be unavoidable.

As to the advantage of the dialysed over the oxychloride made by saturation with hydrate of iron, that is best ascertained by comparing their taste, which in the former is scarcely astringent, while that of the latter is distinctly ferruginous. A preparation now before me, imported from Germany, called Ferrum oxydatum dialysatum, I do not hesitate to say has been made by saturation alone, or by incomplete dialysis; for its reaction is distinctly acid and its taste quite styptic. Some French preparations, sold by the same name, were found to be superior to the German in both respects; but one yielded only 3·3 per cent. of solid matter, another less than half that quantity. A 5 per cent. solution of dialysed iron should yield 3 grains of dry residue when 60 grains of it are carefully evaporated to complete dryness.

The characteristics of a 5 per cent. solution of dialysed iron may be stated to be—

1. The deep brown-red colour, which in thin layers is perfectly transparent.
2. The freedom from odour and taste, it being merely faintly astringent to the palate.
3. The absence of even slight acid reaction to test-paper; and
4. The behaviour to tannin and to saline solutions (even spring water), as stated above.

It is best given by itself upon sugar, or mixed with some simple syrup which is free from acid. It should be mentioned yet that the same preparation has made its appearance in Austria as *catalytic iron.*

* From the *American Journal of Pharmacy* for July.

THE VALUE OF MUSHROOMS AS FOOD.*

BY THEOD. HUSEMANN.

The popular use of edible mushrooms and the problem how to facilitate their general employment without risk of poisoning, is a theme which deserves the highest attention of public economists. A valuable article of food, which occurs nearly everywhere in colossal proportions, is at present completely neglected, although it is worthy, on account of its chemical composition, to be placed by the side of meat, the most important nitrogenous food of man. In many portions of Germany the vegetation of fungi, in favourable years, is so prolific that a single person is able to collect in ten or fifteen minutes sufficient food for several families—not to speak of such giant mushrooms as *Fistulina hepatica*, a single one of which sometimes attains a weight of thirty pounds, capable of furnishing sustenance for a whole family. *Clavaria Botrytis* and *Clavaria flava*, *Boletus edulis* and other allied species occur in such immense quantities, that the gathering of several hundredweights would be a very easy task. The food value of mushrooms has heretofore been made the subject of exhaustive investigations by Kohlrausch and Siegel, who found in 100 parts of *dried Morchella esculenta* 35·18 per cent. of protein, in *Morchella conica*, 29·64 per cent., and in *Helvella esculenta*, 26·31 per cent., besides about 2·3 per cent. of fatty matters, and a considerable quantity of sugar (mannite): in *Morchella esculenta* (dried), as much as ten per cent. In addition, these mushrooms contain a very high percentage of potassium salts, and of phosphoric acid, amounting to 46—49 per cent. of the ash. The following other fungi have also been examined:

Boletus edulis: in 100 parts of dry substance, 22·82 protein; 5·14 mannite; 1·98 fat. The ash contains 50·95 potash and 20·12 phosphoric acid.

Cantharellus cibarius: 10·68 protein; 23·43 mannite; 1·38 fat. The ash contains 48·75 potash, and 31·32 phosphoric acid.

Clavaria flava: 24·43 protein; 4·81 mannite; 12·13 fat. The ash: 51·47 potash, and 35·07 phosphoric acid.

Tuber cibarium: 36·32 protein; 2·48 fat. The ash: 55·97 potash, and 30·85 phosphoric acid.

Agaricus campestris: 20·63 protein; 1·75 fat; 4·91 mannite; 7·13 fermentable sugar. The ash: 50·71 potash, but only 15·43 phosphoric acid, most of which are replaced by sulphuric acid.

It is highly probable that age and location promote variations even in the same species, not only as regards the percentage of protein, but also the composition of the ash. But these differences are so insignificant that they have no effect whatever upon the high rank which mushrooms occupy among nitrogenous foods. Kohlrausoh compares the most usual of the latter in reference to their percentage of nitrogen, in the following tables:—

Protein-substance calculated for	Beef.	Veal.	Wheat bread.	Oatmeal.	Barley bread.	Leguminous fruits.	Potatoes.	Mushrooms.
100 parts of dry substance.	38·69	44·05	8·03	9·74	6·39	27·05	4·85	33·0

This comparison shows that the statement made above, regarding the neglect of one of the most accessible and valuable articles of food, is well supported. It is considered one of the greatest merits of Liebig, that he made the immense quantities of otherwise almost useless South American beef serviceable to man in the shape of extract. The nutritive and therapeutic value of this depends in a great measure upon its percentage of potash-salts and of phosphoric acid; and a simple comparison will show that an equally valuable food may be prepared, in the form of extract, from mushrooms.

This extract, besides can be prepared so as to retain the peculiar aroma of the mushroom, which is very pleasant for itself, and is even more highly valued as a piquant addition to meats in the form of catsup, while the Fray-Bentos extract possesses a flavour by no means agreeable to all consumers. It is true, that some species of fungi, as *Boletus* (which are by far the most numerous and common), are almost devoid of this aroma, but they are at least free from any disagreeable twang, and, if proper care be exercised to avoid the poisonous ones, the labour of collecting and preparing an extract from them for culinary and therapeutic purposes would richly repay some enterprising pharmacist.

* From *New Remedies*, May, 1877.

FORMULÆ FOR NEW MEDICAMENTS ADOPTED BY THE PARIS PHARMACEUTICAL SOCIETY.

(*Concluded from page* 68.)

SOLUTION OF POTASSIUM SILICATE (*Silicate de Potasse Chirurgical*).

Purified Potassium Carbonate (indicating 78° alkalimetrical), 36 grams; Fine White Dry Sand, 63 grams. Mix and heat to a white heat in an elliptical reverberatory furnace during four hours. The resulting glass is transparent, very homogeneous and colourless, or presenting a slightly amber tint. To prepare the solution of this salt coarsely powdered fragments are introduced into an iron digester under very high pressure, together with sufficient water to make a solution having a specifi gravity of 1·277 to 1·299. It is important that the water should be as pure as possible and carefully freed from lime salts, which would give rise to the formation of insoluble calcium silicate, rendering the solution of potassium silicate more or less turbid and opalescent. Under these conditions the potassium silicate is entirely dissolved.

POTION DE TODD.

Old Eau-de-vie, 60 grams; Sugar Syrup, 40 grams; Distilled Water, 90 grams; Tincture of Canella, 10 grams. The eau-de-vie is sometimes replaced by rum.

WINE OF QUASSIA.

Lunel Wine, 1000 grams; Quassia Chips, 30 grams. Macerate during ten days with occasional agitation and filter.

QUININE.

QUININE HYDROFERROCYANIDE.

$2\,O_{20}H_{24}N_2O_2 \cdot H_4FeCy_6 + 4\,H_2O.$

Quinine Sulphate, 4 parts; Potassium Ferrocyanide, 1 part. Shake the quinine sulphate in a flask with sufficient distilled water to make a clear solution when boiled; add the potassium ferrocyanide in concentrated solution; raise the temperature of the liquor to boiling for a few moments, and allow it to cool; quinine hydroferrocyanide is then deposited as a resinoid mass. The mother liquor is decanted, and may be concentrated to obtain a further yield of the quinine salt, and the salt is purified by one or two washings with warm water.

This compound may be obtained in small crystals by repeatedly dissolving the amorphous product in boiling alcohol and abandoning the solution to spontaneous evaporation.

Quinine hydroferrocyanide is yellow, amorphous or small acicular masses, and bitter. It is scarcely solubl in water, but very soluble in alcohol, especially when ho It effloresces when exposed to the air. In solution it should not be precipitated by barium chloride. When calcined for some time in the air it should leave a residue of oxide of iron without any soluble potash salt.

Basic Quinine Hydrobromide (*Bromhydrate basique de Quinine*). $C_{20}H_{24}N_2O_2, HBr+H_2O$.

Basic Quinine Sulphate, 10 grams; Dry Barium Bromide, 3·40 grams; Distilled Water, 100 grams. Suspend the quinine sulphate in 80 grams of water, filter, evaporate and leave to crystallize.

Basic quinine hydrobromide crystallizes in needles grouped in silky white tufts. It is very soluble in hot water, soluble in about 60 parts of cold water, and should not be precipitated by soluble sulphates.

One gram of basic quinine hydrobromide is entirely precipitated by 0·401 gram of silver nitrate.

Neutral Quinine Hydrobromide (*Bromhydrate neutre de Quinine*). $C_{20}H_{24}N_2O_2, 2HBr+3H_2O$.

Basic Sulphate of Quinine, 10 grams; Sulphuric Acid (1:10) 11·2 c.c.; Dry Barium Bromide, 6·80 grams; Distilled Water, 75 grams. Dissolve the quinine sulphate in 50 grams of water containing the sulphuric acid, and the barium bromide in 25 grams of water. Mix the two solutions, boil for a few moments, and filter. The liquor, evaporated to 35 grams and cooled, yields beautiful prismatic crystals, very soluble in boiling water, soluble in 7 parts of cold water, and very soluble in alcohol. This salt should not be precipitated by soluble sulphates.

1 gram of crystallized neutral quinine hydrobromide is entirely precipitated by 0·629 gram of silver nitrate.

Quinine Tannate. $C_{20}H_{24}N_2O_2, 2C_{27}H_{22}O_{17}$.

Add to quinine acetate in neutral solution sufficient solution of gallotannic acid (tannin of gall nuts), deprived of resinous matters, to redissolve the white mass of quinine tannate that is at first formed. Neutralize this solution exactly with sodium bicarbonate, which precipitates the whole of the quinine tannate in proportion as the acidity of the liquid diminishes. Collect the product upon a filter, drain off the mother liquor, and leave it to dry in the air; then powder the residue, wash it upon a filter with distilled water, and again dry.

Quinine tannate is amorphous, pulverulent and white. When prepared from the sulphate it always contains a quantity of sulphuric acid. When prepared as above described it contains 20·6 per cent. of quinine and corresponds to ordinary quinine sulphate in the proportion of 3·5 of tannate to 1 of sulphate.

Alkaloidal Soaps (*Savons d'Alcaloides*).

These compounds being nearly insoluble in water are usually obtained by double decomposition. An aqueous solution of quite neutral medicinal soap is made to react upon a concentrated neutral solution of the hydrochlorate of the base it is desired to combine with the fat acids of the soap until turbidity is no longer produced in the soap solution. The precipitate is collected, washed, and dried gently in a stove.

This method of production is preferable to that of uniting the alkaloid directly with the fat acids, because the product resulting from the latter method presents a less constant composition.

Metallic Soaps (*Savons métalliques*).

The metallic soaps (oleomargarates) are obtained by double decomposition. An aqueous solution of a metallic salt is poured into a perfectly neutral solution of medicinal soap until the precipitate ceases to augment. The precipitate is collected upon a cloth and strongly pressed.

The soluble sulphates allow of the preparation of a large number of metallic soaps (oleomargarates of iron, copper, zinc, etc.). For the mercurial soap it is necessary to employ the protonitrate dissolved in a little water acidulated with nitric acid or mercuric acetate.

Sodium Bromide. NaBr.

Soapmakers' Ley (caustic soda), free from chlorine, q. s.; Pure Bromine, q. s. Place the alkaline liquor in a long necked vessel, immerse in it the end of a funnel tube slightly drawn out, and pour the bromine into this gradually, with occasional agitation, until the liquor retains the colour and odour of the metalloid. Evaporate the saline product to dryness in a porcelain capsule. Heat it afterwards in a crucible to a dull redness until it ceases to give off gaseous bubbles of oxygen. Allow it to cool and dissolve the mass in distilled water and afterwards evaporate to dryness or to crystallization.

Sodium bromide is white. It is nearly entirely soluble in its weight of water and is also soluble in alcohol. Its solution should not be precipitated by barium chloride, nor coloured by the addition of a strong acid. When shaken with a little starch paste and nitric acid containing nitrous acid, it should not give a blue or violet colour.

1 gram of pure dry sodium bromide is completely precipitated by 1·650 of silver nitrate.

Sodium Hypophosphite (*Hypophosphite of Soda*). $Na\,Ph\,H_2O_2$.

Calcium Hypophosphite, 10 parts; Crystallized Sodium Carbonate, 16 parts. Dissolve the salts separately in a little lukewarm water, and mix the solution, ascertaining by reagents that neither is in excess. Ammonium oxalate should give no precipitate and hydrochloric acid should cause no effervescence. Filter to separate insoluble calcium carbonate and wash the precipitate to remove any hypophosphite it might contain. Concentrate the united liquors in a water-bath at a temperature of 60° C. to avoid detonations. The dry residue should be preserved in a closed vessel.

Sodium hypophosphite is a white, amorphous or crystalline, deliquescent salt, completely soluble in two parts of water, and 15 parts of 90° alcohol. It possesses the characters of the hypophosphites and of the salts of soda. It ought not to effervesce with acids, nor be precipitated by barium chloride or by the sulphates. Oxalic acid does not give with it any turbidity.

Syrup.—Sodium Hypophosphite, 5 grams; Simple Syrup, 445 grams; Syrup of Orange Flowers, 50 grams. F. S. A. a syrup by simple solution. It will contain in each tablespoonful of 20 grams 0·20 gram of sodium hypophosphite.

Sodium Iodide. NaI.

Sodium iodide is prepared similarly to potassium iodide, substituting sodium carbonate for potassium carbonate (Codex). It is a white deliquescent salt, crystallizing in cubes containing two equivalents of water. It is very soluble in water and soluble in alcohol. Air decomposes it, setting free iodine.

One gram of dry pure sodium iodide is entirely precipitated by 1·13 gram of silver nitrate.

Sodium Lactate. $NaC_3H_5O_3$.

Dilute lactic acid with three parts of water, saturate whilst boiling with sodium bicarbonate, then evaporate and run into flakes.

Sodium lactate is a very deliquescent salt. The solution evaporated to the consistence of a syrup deposits flattened prismatic crystals and stellar groups of needles.

Neutral Sodium Sulphite. $NaSO_3, 7H_2O$.

Prepare a concentrated solution of pure crystallized sodium carbonate (1 part of salt to 2 of water); divide it into two parts and saturate one with sulphurous acid gas; then mix with it the other part, boil to drive off excess of gas, and leave to crystallize. A very neutral sulphite is thus obtained. The crystals should be kept sheltered from the air.

This salt occurs in oblique rhomboidal prisms, containing seven equivalents of water. It is very soluble in water, its maximum solubility being at 33° C., above that temperature it deposits anhydrous crystals of neutral sulphite. Its solution, if slightly alkaline, oxidizes slowly in the air.

100 cubic centimetres of a solution containing 1·26 gram of pure neutral sodium sulphite per litre, with starch paste added, absorbs 10 c.c. of iodine solution containing 12·7 grams per litre before giving a persistent blue colour.

SODIUM SULPHOVINATE. $NaC_2H_5SO_4,H_2O$.

Sulphovinic acid is first prepared by pouring gradually, with great care and unceasing stirring with a glass rod, 1000 grams of 60° sulphuric acid into 1000 grams of rectified 96° alcohol. The mixture is left for some hours in contact, then diluted with 4 litres of distilled water, and afterwards saturated with pure barium carbonate. When the saturation is complete the barium sulphate is allowed to deposit on a filter. The solution of barium sulphovinate is then decomposed with pure carbonate of soda until it ceases to give a precipitate. The liquid evaporated in a water-bath is left to crystallize. If necessary, the crystals are purified by recrystallization. They should be kept in well-closed flasks. The proportions given yield about 1000 grams of sodium sulphovinate.

Sodium sulphovinate crystallizes in hexagonal tables, which are slightly unctuous to the touch and very soluble in water and in alcohol. If heated in a capsule they give off at 120° the alcohol which they contain in combination. They become gradually deprived of bitterness. Sodium sulphovinate ought not to contain sulphuric acid, nor have an acid taste. It should not be precipitated by barium chloride, and especially by soluble sulphates. The possession of either of these properties is a proof of faulty preparation and that a portion of the sulphovinic acid has been decomposed. In such a case it should be rejected.

EXTRACTION OF CAFFEINE FROM GUARANA.*

BY FRANCIS V. GREENE, M.D., U.S.N.

In determining the percentage of caffeine in guarana, Stenhouse (*Pharm. Journ.*, 1st ser., vol. xvi., p. 212; *Amer. Journ. Pharm.*, 1857, p. 68) employed the following process: The finely powdered substance was boiled for some time with distilled water, the insoluble portion removed by filtration, and a slight excess of basic acetate of lead added to the filtrate. The resulting brownish-red precipitate was thoroughly washed with boiling water, and sulphuretted hydrogen gas passed through the filtered liquid. The sulphide of lead was filtered off, the filtrate evaporated to dryness on a water-bath, and the residue dissolved in a small quantity of boiling alcohol and filtered. On evaporating this liquid nearly to dryness, yellowish crystals were obtained, which, after being pressed between folds of bibulous paper, were dissolved in diluted alcohol. By the evaporation of this menstruum, the crystals of caffeine were obtained perfectly free from colour.

In repeating this process for the purpose of estimating the quantity of caffeine contained in a specimen of guarana procured from the Brazilian collection at the Centennial Exhibition, the difficulty of separating the solution from the portion insoluble in boiling water, and the tediousness of the process of washing the mass precipitated by the acetate of lead solution, led me to seek some other method by which these impediments might be avoided, and I therefore determined to attempt the separation by means of litharge, which substance has been highly recommended (*Amer. Journ. Pharm.*, 1875, p. 135) by Professor E. S. Wayne, for the extraction of caffeine from tea and coffee. The result, confirmed by several trials of the process, proves that this compound of lead answers equally well for guarana, and that by its employment the quantitative determination of the caffeine in this substance can be effected with the utmost facility.

The details of the method are as follow: the powdered guarana is intimately mixed with three times its weight of finely divided litharge, and the mixture boiled in distilled water, the ebullition being continued until, on allowing the temperature to fall below the boiling point, the insoluble portion is found to subside rapidly, leaving the supernatant liquid clear, bright, and without colour. The quantity of distilled water required will be found to be about a pint for every fifteen grams of the guarana used in the experiment, and, as the boiling has to be continued for several hours before the desired and all-essential separation mentioned above takes place, water must be added from time to time to supply the place of that lost by evaporation. When cool, the clear liquid is decanted upon a filter, and when it has passed through, which it will be found to do with facility, the precipitate is to be transfered to the filter and washed with boiling water, the washing to be continued as long as yellowish precipitates are produced with either phosphomolybdic acid solution, auric or platinic chloride. A stream of sulphuretted hydrogen gas is now passed through the filtrate to remove the small quantity of lead that has been dissolved, and the sulphide thus formed is separated by filtration. The solution is evaporated on a water-bath to expel the excess of sulphuretted hydrogen, filtered to remove a trace of sulphur, finally evaporated to the crystallizing point, and the caffeine, which crystallizes out on cooling, removed from the mother liquor and pressed between folds of bibulous paper. After being thus treated the crystals will be found to be perfectly white. On diluting the mother liquor with distilled water, filtering and evaporating, a second crop of crystals are obtained, which are also perfectly white, after being pressed as above. The crystals are now dissolved in boiling diluted alcohol, filtered, and the solution set aside to crystallize by spontaneous evaporation. The resulting crystals of caffeine are perfectly pure and colourless.

In order to test the accuracy of the process, fourteen grams of guarana in an impapable powder were treated with the utmost care, as above described. The extracted caffeine, after drying at 100° F. until the weight became constant, was found to weigh ·707 gram, 5·05 per cent., a remarkably close approximation to the results of Stenhouse, who, from 25 grams of guarana, obtained 1·260 gram of caffeine = 5·04 per cent., and from 14 grams 5·1 per cent. Average = 5·07.

As this method of extracting caffeine is entirely devoid of all complicated steps, and requires but a short space of time for its completion, it may be used advantageously in estimating the percentage of caffeine in the fluid extract of guarana, which is prescribed to a certain extent at present, and may possibly be more extensively used in the future.

In regard to the proper accentuation of the name of the substance prepared from the seeds of the *Paullinia sorbilis*, by the Indian tribes on the upper Amazon, I would state that throughout Brazil, and in all parts of South America, where the preparation is used, the word is universally accented on the last syllable, *Guaraná* and never pronounced *Guarána*, the popular method of accenting the term in this country. The placing of the accent on the last syllable in words ending in *a* is not at all unusual in the Guarany language; for instance, as regards localities, Paraná and Ceará, retain their Indian accentuation; and in the vegetable world, the *Caladium esculentum* is always spoken of as the Tajá or Tayá, the *Franciscea uniflora* as the Manacá, and the *Gomphia parviflora*, as the Batiputá.

* From the *American Journal of Pharmacy*, July, 1877.

NOTE ON HYPOPHOSPHITE OF BERBERINA.*

BY J. U. LLOYD.

Take of Sulphate of Berberina, .	1 part
Distilled Water, ...	24 parts
Lead Monoxide, ...	½ part
Hypophosphorous Acid, .	q. s.

Dissolve the sulphate of berberina in the distilled water

* From the *American Journal of Pharmacy*, July, 1877.

at the temperature of 180° F. Add the lead monoxide, and digest at the above temperature until a filtered portion will not produce a precipitate with solution of acetate of lead (or a hot solution of chloride of barium); from 6 to 12 hours will accomplish this. Filter out the excess of lead and sulphate of lead formed, pass sulphuretted hydrogen through the solution to separate any traces of lead which may remain, and filter again. Evaporate the solution of berberina to the measure of 8 fluidounces, add solution of hypophosphorous acid until in slight excess, and allow the mixture to cool. Separate the magma of fine crystals with a filter paper or muslin strainer, and dry.

Hypophosphite of berberina is a beautiful yellow salt, much more soluble than the muriate.

By substituting other acids for the hypophosphorous almost any salt of berberina can be easily formed. When free from foreign substances, I have failed to find any salt of this alkaloid as soluble in cold water as the berberina itself, but the hypophosphite will dissolve readily to a considerable extent, and is the most desirable form I am acquainted with.

COMMERCIAL DRUGS OF THE CHINESE PROVINCE OF KUANG-TUNG (CANTON).*

BY DR. F. HIRTH DU FRENES, OF AMOY, CHINA.

Ginger grows in nearly all parts of the province of Kuang-tung. According to Chinese sources the district Nan'-hai, which belongs to the city of Canton, produces greater quantities and a better quality than the other neighbouring districts. The independent tribe of the Miao-tsu, in the mountains at the north-western border of the same province, are also said to produce large quantities of ginger. In the district of Hsin-hsing—about thirty miles south of the city Chao-ching, on the Western River—three-tenths of the flat land and seven-tenths of the cultivated soil in the hills are planted with ginger. A distinction is made between flat-land ginger (in the Canton dialect tin-keung), which is generally soft and tender, and mountain ginger (shan-keung), which is brittle and very pungent. For home consumption the Chinese pickle it in vinegar; the more expensive syrup-ginger (t'ong-keung) is almost exclusively consumed by foreigners or exported.

A less important, but interesting drug is *galgant* root, which has its original home, and, even now, almost exclusive growth in the province of Kuang-tung. European druggists distinguish two varieties: radix galangæ majoris, the greater galgant; and radix galangæ minoris, the lesser or true galgant. The latter is the Chinese drug. The dried root, which is sold by the grower at the rate of about 1·50 dollar per picul (=133⅓ lbs.), and which may be purchased at present in the new treaty-port Hai-k'on upon Hainan, for 1·60 dollar per picul, is brought by junks to Hongkong and Canton, where its price ranges at about three or four dollars, and whence it is exported to Hamburg or to the United States. Russia also consumes considerable quantities of galgant, which is said to be mostly carried over Hankow; it is there chiefly used to impart a characteristic aroma to a favourite liquor, called Nastoika, and is a favourite spice and medicine among the Livonians and Esthonians.

Another product occurring upon the Canton market is *Curcuma* or turmeric, which is the root of various species of Curcuma growing in the immediate vicinity of Canton, chiefly in the district Tan-yü, to which the eastern half of the city of Canton belongs. A great deal of it reaches the market already in the form of powder.

Much confusion has been caused by the application of the term *China-root* (Radix Chinæ) to various entirely different drugs. In reality this name is applied to two products only, which have only a distant resemblance to each other. The true China-root, which is understood by this name in European pharmacy, grows in the neighbourhood of Canton. In the Chinese herbal, Pên-tsao, it is described under the name tu-fu-ling, while the false China-root, which grows in the province of Sze-chuen, and is brought to market at Hankow on the Yang-tse, is called in the same work by the similarly sounding name fu-ling; and it is not impossible that this resemblance in Chinese names has been the cause of the confusion.* Dr. H. F. Hance, who examined one of the plants from which the true root is derived, declared it to be *Smilax glabra*, Roxb. It is said to be found all over the province Kuang-tung. The description of China-root, which is found in Dr. S. Wells Williams's 'Commercial Guide,' refers only to the China-root of the North (a species of fungus, *Pachyma Cocos*), which forms indeed a considerable article of trade, but is scarcely ever exported further than to the Chinese colonies in Southern China and in the Malay Archipelago. On the other hand, the China-root of the South—which is the only one in demand for the European Market, although it fetches a much lower price—is exported from Canton either direct or by way of Hong-kong to Europe, the United States, or to the East Indies.

Canton is also a chief market for various industrial oils, principally *pea-nut oil* from *Arachis hypogæa.* This plant is of great agricultural importance in Southern China, particularly in the four western departments of the province of Kuang-tung.† The oil obtained from the nuts is carried upon junks belonging to a great commercial native corporation, first to Ch'en-tsun, a river-harbour close by Canton, whence it is distributed to the interior by means of a highly-ramified system of canals. Of the various grades of the oil produced in the neighbourhood of Canton, that from Tsung-hua, about 20 miles north of Canton, is considered the best. The trade in other oils is insignificant in comparison to that just mentioned; nevertheless, a few deserve mention. *Tea-oil*, obtained from the seed-kernels of *Camellia oleifera* (Chin. ch'a-shu, *i.e.*, tea-tree), is mostly produced in the northern districts of the province, namely, in Nan-hsiung, Shao-chou, Lien-chou, and Lien-shan. In Kuang-chou fu, in the department "Kanton," and in Chao-ch'ing fu a sweetish aromatic oil is obtained from various sorts of cabbage, which is known in the market as *cabbage-oil* (tsai-yu). All these oils, when purified, are used by the Chinese for culinary purposes, while the inferior sorts are utilized for burning in lamps. Other oils are produced from *sesame*, from the Chinese *olive* (a species of *Canarium*, the fruit of which has only a slight resemblance to the European olive), and from yellow and white *beans*. *Wood-oil* is obtained from the seeds of the wu-t'ung tree (*Dryandra cordata*, Thunb.,‡ which has its home in the north of the province of Nan-hsiung and Shao-chou fu.

The woods of Hainan are rich in aromatic woods, the botanic origin of some of which is still enveloped in doubt. The most important are *eagle-wood* (lignum aloës and *rose-wood*, the chief depot for export being Ai-chou at the south-coast. The principal commercial articles of Pei-hai (Pak-hoi) are sugar, oil, and indigo, the best quality of which latter is produced near Pei-lin (Pak-loa), about 60 miles north of Pei-hei. Next may be mentioned: China-root, galls, incense, myrrh, wood-oil, assafœtida and *star-anise*. Of the latter between 1000 and 2500 piculs are brought to market annually at Macao and Canton. In 1871, at the latter port alone, 2704 pic. were delivered from Pak-hoi in junks. Our pharmacological text-books usually attribute the production of star-anise to Japan, the Philippine Islands and to the Chinese province Fu-chien, while is now well-known that the border districts of An-nam, Kuang-tung and Kuang-hsi are its real home.

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* On China-root see 'Pharmacographia,' p. 648.

† These are called the "lower 4 Fu," "hsia-ssu-fu," namely, Chiung-chou (Hainan) Lei-chou (the peninsula), Lien-chou and Kao-chu.

‡ This is different from gurjun or wood-oil, obtained from various species of *Dipterocarpus*.

* From the *New Remedies*, June, 1877.

The Pharmaceutical Journal.

SATURDAY, AUGUST 4, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE DISPUTE BETWEEN M. PASTEUR AND DR. BASTIAN.

THE hope that, for once, a dispute between scientific men on a point of fact might be settled rationally, and that it would be conclusively ascertained whether Dr. BASTIAN was right in affirming, or M. PASTEUR in denying, that bacteria will swarm in previously boiled urine, after being exactly neutralized by pure caustic potash and carefully protected from contamination,* has been rudely dashed to the ground by an announcement just made. It will be remembered that in order to decide between the disputants a commission consisting of Messrs. DUMAS, MILNE-EDWARDS, and BOUSSINGAULT was appointed by the French Academy of Sciences. The miscarriage of the proceedings of this Commission, as described by Dr. BASTIAN, is certainly very ludicrous.

Learning from the *Compte Rendu* of the sitting that the Commission had been appointed, Dr. BASTIAN wrote on the 27th of February to M. DUMAS, offering to go to Paris for three days at a convenient time to perform his experiments before the members. The reply to this letter appears to have miscarried, for on the 5th of May Dr. BASTIAN received a letter,—that had been misdirected,—referring to one that had been sent three weeks earlier but not received, reiterating that the Commission were ready to receive Dr. BASTIAN, and that the laboratory of the Ecole Normale or any other that he chose would be placed at his disposal. To this Dr. BASTIAN replied, asking for the purport of the missing letter, and saying that in consequence of the delay that had occurred he would not be able to visit Paris until the third week in July. Upon receiving a duplicate copy of the missing letter, Dr. BASTIAN considered it not to be sufficiently explicit as to the limits of the inquiry. He therefore wrote back to say that he considered the essential condition of the inquiry to be, "whether previously boiled "urine, protected from contamination, can or cannot "be made to ferment and swarm with certain organ-"isms by the addition of some quantity of liquor "potassæ which has been heated to 110° C. for twenty "minutes at least." An extension of the inquiry to the theoretical bearings of the experiment he refused to entertain on the ground of the brief time at his disposal. No objection was made to these restrictions, but after a month had passed without reply, Dr. BASTIAN wrote asking for the assurance he required, to which M. DUMAS answered that the Commission would be at his disposal on the 15th of July, and that if possible it would only occupy itself with the subject of urine treated with potash. This did not satisfy Dr. BASTIAN, and he again wrote, asking for a more explicit statement. M. DUMAS replied as follows:—"The Commission "desires, like yourself, that the investigation should "be limited to the point in discussion between you "and M. PASTEUR. It would be only in the case of "your desiring to go further that it would have to see "whether the time would permit more being under-"taken, your visit being short."

* See Vol. vii., p. 758.

After this preliminary epistolary skirmishing, Dr. BASTIAN went to Paris. Upon his arrival, he found that one member of the Commission, M. BOUSSINGAULT, could not attend, and that another, M. MILNE-EDWARDS, would not, unless the Commission were allowed to vary the experiments at discretion. Dr. BASTIAN then suggested that at present his experiment should simply be repeated, and that he should visit Paris again, if any variations were considered necessary. A new member of the Commission, M. VAN TIEGHEM was then appointed by the Academy.

The last act of this comedy was equal to anything that went before. It having been arranged that the experiments should be performed in M. PASTEUR'S laboratory, the disputants and M. VAN TIEGHEM were there at the appointed time. Next M. MILNE-EDWARDS arrived, but, learning then for the first time of the compromise, he at once left the laboratory, followed by M. VAN TIEGHEM. These gentleman appear to have waited for M. DUMAS until they were tired, and then the former went away, and the latter returned to the laboratory. When M. DUMAS arrived, he learnt that M. MILNE-EDWARDS had left, so he went away also, declaring the Commission at an end, without communicating with M. VAN TIEGHEM, M. PASTEUR, or Dr. BASTIAN. And then Dr. BASTIAN went home too.

THE BILL TO AMEND THE SALE OF FOOD AND DRUGS ACT.

THE above Bill, which was mentioned as having been introduced into the House of Commons last week, has made extremely rapid progress, notwithstanding the "obstructiveness" that has since been prevalent in that assembly. It has already been read a second time and passed through committee, and probably before these lines appear it will have been read a third time and passed the lower House. On reading the Bill the necessity for such haste is not altogether manifest in the subject matter, and it presents a novelty in legislation that, although the subject is not strictly pharmaceutical, warrants reference to it here.

The Bill consists of a preamble and one clause, which provides that in determining whether an offence has been committed under section 6 of the Sale of Food and Drugs Act, by selling to the prejudice of the purchaser, whether wholesale or retail, spirits reduced by the admixture of water, regard shall be had not only to the extent of such admixture, but also to the price at which the spirits so reduced are sold.

The principle here laid down is, from some points of view, a reasonable one. But, as a matter of fact, it has already been acted upon in reported spirit cases, and, for this and other reasons, special legislation on the subject seems undesirable. Of course, the object of the measure is to prevent a dishonest sale of a diluted article. As the Bill stands, however, it appears that the essence of the offence will lie, not in the dilution but in the charge of a relatively high price for a small percentage of spirit, a test, it may be remarked, that leaves out entirely the quality as indicated by aroma and flavour, and might place a mature whisky below a crude one. Whether the magistrates are supposed to be sufficiently cognizant with the average amount of water present in gin sold at 5*d.* or any other price per quartern in their respective localities, or whether they are to be able to appeal to Somerset House when puzzled by the conflicting evidence of experts, we cannot say; the most objectionable part appears in the novelty of giving a tradesman the liberty of selling an article, but prohibiting him from putting his own price upon it. Moreover, if price is to be so important a factor in deciding what is an adulteration of spirit, to be consistent, the plea of a seller of diluted milk, or even of watered sweet spirit of nitre, that the price charged was in accord with the quality of the article sold, ought also to be allowed.

REBUILDING OF THE PARIS SCHOOL OF PHARMACY.

About eighteen months since, as was stated in this Journal at the time, the French Legislative Assembly voted a large sum of money for the rebuilding of the Ecole Supérieure de Pharmacie at Paris. A correspondent informs us us that rapid progress is now being made with the foundations. The works are the more interesting from the fact that part of the building will be over catacombs and disused quarries. The entire space to be utilized is four and a quarter acres, the larger part of which will be a garden, as in the present school. There will be two amphitheatres of 480 square yards superficies each, and capable of holding conveniently 600 pupils. At the back will be a laboratory of three stories, greenhouses, etc. It is expected that the new buildings will be ready in 1880.

Those who know the stifling little theatre and mean surroundings of the present school in the Rue de l'Arbalète will feel inclined to congratulate French pharmaciens.

BRITISH PHARMACEUTICAL CONFERENCE.

The following Papers, in addition to those previously announced, are to be read at the meeting of the Conference at Plymouth on the 14th inst.:—

23. Further Note on the History of Tea Hair. Thomas Greenish, F.C.S.
24. Copaiba Testing. Louis Siebold, F.C.S.
25. A New Medicinal Solution of Phosphorus. Mr. W. W. Urwick.
26. Blood-Albumen. C. T. Kingzett, F.C.S.
27. Note on Pilocarpine. C. T. Kingzett, F.C.S.
28. Note on Hederic Acid. C. T. Kingzett, F.C.S.
29. Effects of Variations of Temperature on Boiled Putrescible Liquids. Mr. W. Willmott.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, August 1, 1877.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present — Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Gostling, Greenish, Hampson, Hills, Owen, Rimmington, Robbins, Sandford, Schacht and Shaw.

The minutes of the previous meeting were read and confirmed.

The following being duly registered as Pharmaceutical Chemists were respectively granted a diploma stamped with the seal of the Society.—

Avison, David.
Barron, William.
Burden, John Britten.
Chapman, Joseph John.
Clark, William Inglis.
Dick, Robert Gibson.
Fletcher, Redfern.
Giles, William Egbert.
Griffiths, John Moore.
Hardwick, Stewart.
Holmes, Alfred John.
Jones, Thomas.
Longman, John Ham.
Maggs, Frederick Richard.
Reece, Thomas.
Rickarby, Arthur George.
Simpson, John.
Snell, Charles Henry.
Tuck, Walter Barber.
Wallis, Owen.

Elections.

MEMBERS.

Pharmaceutical Chemists.

The following Pharmaceutical Chemists were elected Members of the Society:—

Avison, David ....London.
Burden, John Britten ....London.
Chapman, Joseph John ....Bramfield.
Clark, William Inglis ....Edinburgh.
Dick, Robert Gibson ....Edinburgh.
Dimmock, Augustus Frederick London.
Francis, Rawson Parke ....London.
Hardwick, Stewart ....Grantham.
Holmes, Alfred John ....London.
Jones, Thomas ....London.
Longman, John Ham ....Weymouth.
Rickarby, Arthur George ......Kirby-le-Soken.
Simpson, John ....London.
Snell, Charles Henry .... Saõ Paulo, Brazil.
Tuck, Walter Barber ....London.

The following registered Chemist and Druggist was elected a Member of the Society:—

Chemist and Druggist.

Hassall, Elijah ... .Stalybridge.

ASSOCIATES IN BUSINESS.

The following having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year were elected "Associates in Businesss" of the Society:—

Minor.

Davidson, William ....Chester.
Hinks, John ....Worcester.
Ogilvie, William Ogilvie ....Arbroath.
Wild, John ....Manchester.

Modified.

Davis, Joseph Burnard ....Lynton.
Hickman, William ....Red Hill.
McAdam, Robert................. Glasgow.
Taylor, John ....Rochdale.
Tocher, George ....Friockheim.

ASSOCIATES.

The following having passed the Minor examination and having tendered (or paid, as Apprentices or Students) their subscriptions for the current year, were elected "Associates" of the Society:—

Abbott, George...... ....Liverpool.
Atkins, William Ralph ....Salisbury.
Bartlett, Hubert ....London.
Bishop, Henry ....Wisbeach.
Boa, Peter ....Stranraer.
Clarke, Ethelbert ....Maidstone.
Cliff, James ....Wakefield.
Cobb, Joseph Septimus ....Doncaster.
Foster, James Edward...........Bridgwater.
Gosney, Charles Frederick ......Crewkerne.
Harpham, John ....Newark.
Inglis, William Keiller ....Ashton-under-Lyne.
Jackson, Barnet Edward.........Heywood.
Jones, Thomas Bevan ....Merthyr.
King, William ....Southend.
Mead, Charles John ....Wimborne.
Mills, William Hamer............Heywood.
Milton, Harry ....Exeter.
Moore, John William ....Northampton.
Mortlock, William John ....Peckham.
Nicholson, John Hastie ....Moffat.
Pattinson, William ....Hexham.
Perkin, Thomas ....Stourbridge.
Rheeder, Thomas ....Knaresborough.
Saunders, James Warnes.........Hackney.
Shone, Owen Ellis ....Lambeth.
Slinger, Robert Thomas ....Manchester.
Starkey, George Thomas.........Stratford-on-Avon.
Taylor, Henry Patrick............London.
Walker, James ....Auchmull.
Williams, Alfred Joseph ....London.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary examination, and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Borkwood, Edward Turner......Boston.
Brown, Alexander ....Motherwell.
Cappell, Robert................. .....Crieff.
Capper, Henry ....Liverpool.
Clarke, Henry R. Stanhope ...Malvern.
Clay, Charles.......................Clay Cross.
Clayton, Christopher ....Market Rasen.
Cleland, Andrew Hutcheson ...Eastwood.
Cole, William ....West Cowes.
Day, Arthur Joseph..... ....Maidstone.
Gowans, John Bruce ....Perth.
Graham, George Leslie............Maidstone.
Greaves, William Thomas ......Nottingham.
Jackson, George Granger ......Buxton.
Kenny, Thomas......................Boston.
Kett. George Robert ....London.
Laing, Alexander ....Kelso.
Mann, Samuel William ....Bristol.
Marsh, Edward......... ....Luton.
Metcalfe, John ....Darlington.
Moody, Lewis ....Lincoln.
Odhams, George Frederick ......Faversham.
Painter, William, junr. ....Broadstairs.
Parker, Charles.....................Lancaster.
Parker, Henry George... ....Kettering.
Porter, Samuel Edward ....Southery.
Powell, Francis Edward ....London.
Pringle, George......................Kirkcaldy.
Rawes, William ....Hulme.
Richards, Benjamin ....St. Dogmells.
Schofield, Frederick Elston......Morpeth.
Sergeant, Furlow Ross ....Goxhill.
Slicer, Walter ....Bingley.
Thompson, Charles Letchford ..London.
Thomson, Ernest Andrew ..... Plymouth.
Watts, George William ....Clapham.
Wheldon, James Alfred ....Darlington.
Wilkins, Walter Sydney ...... .London.
Williams, Evan Wynne ....Dolgelly.

The names of the following persons were restored to the Register of Chemists and Druggists:—

Charles James Merrick, 52, Great Coram Street, London, W.C.

Francis Miles Stickler, 5, The Pavement, Forest Hill, Kent.

REPORTS OF COMMITTEES.

FINANCE.

The report of this Committee was received and adopted, and sundry accounts were ordered to be paid.

BENEVOLENT FUND.

The report of this Committee included the recommendation of the following grant:—

£10 to a registered chemist and druggist, who had previously received a grant of £10.

Other cases had been considered, but from various causes it was not deemed desirable to make any recommendation in respect to them.

The report and recommendation of the Committee were received and adopted.

Mr. GREENISH brought forward one of the cases in which the Committee had declined to recommend a grant, and hoped the Council would reconsider the decision, but after a short conversation, the motion meeting with no support, it was not pressed to a division.

Mr. OWEN reported that he had expended the thirty guineas voted last month to assist in securing the election of an orphan into an asylum, and that the child was elected. He might add that no money had been wasted, for the number of votes obtained was only seven above the lowest required. He hoped, therefore, that the Council would be encouraged to take up the cases of orphans in future.

The PRESIDENT said the Council was very much indebted to Mr. Owen for the trouble he had taken in this and many similar cases.

LIBRARY, MUSEUM AND LABORATORY.

The Librarian had reported the average attendance in the library during the previous month to have been, day 21, evening 9. The circulation of books had been, in town 141; in the country, to 21 places, 36. He reported donations from Guy's Hospital, Mons. L. Pasteur, Prof. Dragendorff, and Dr. W. Douglas-Hogg. Letters of thanks were ordered to be sent to the donors. The following was recommended for purchase: Cooke's 'Myxomycetes of Great Britain.'

The Committee recommended that the Library be closed in the evening during August and September.

The Curator had reported the average attendance in the Museum during the month to have been, morning 19, evening 4. Donations had been received from Prof. Attfield, Mr. E. Fielding, Mons. Chantre, Mrs. Reeves, Mr. Bullock, Mr. Walter Hills.

A proof of a portion of the chemical part of the catalogue had been submitted, and at the request of the Committee the President and Mr. Greenish had undertaken to revise the proof before going to press. On the application of Mr. Mackay, the curator had been instructed to send labels to the North British Branch for the museum in Edinburgh.

Professor Bentley had reported a very good attendance in his class at the Botanical Gardens, the average being higher than usual.

Professor Attfield had also reported that the attendance in the laboratory had been better than usual at the end of the session.

The Secretary had submitted the returns respecting the educational department of the Society, as ordered at the last meeting of the Council, but the Committee not considering them sufficiently comprehensive had instructed him to prepare further and more detailed particulars.

The arrangements for the evening meetings had been considered and it had been resolved to recommend that the Professors, the Editor of the Journal, and the Curator be appointed a Committee to examine all papers presented for reading at the evening meetings, and that the arrangements made by the Evening Meetings Committee at its meeting on November 18, 1874, be again adopted, viz., that all papers selected to be read at the evening meetings shall, on the recommendation of the Committee, be paid for at the usual rate when published in the Journal. The Committee also recommended that the above arrangement be carried out for not less than one session, and that the Evening Meetings Committee report to this Committee at the end of the session. It was also recommended that a notice be made public, that papers intended to be read at the evening meetings should be forwarded to the Secretary a week previous to the day of the meeting. It was considered desirable that the Evening Meeting Committee should meet regularly, the time of meeting being left to the Committee itself to determine.

At an adjourned meeting of the Committee a letter asking if the Society intended to exhibit specimens of drugs at the Museum of the British Medical Association during the annual meetings to be held in Manchester, had been directed to be answered in the negative. Donations to the library were announced from the Royal College of Veterinary Surgeons, the Surgeon-General of the United States Army, Mr. Udoy Chand Dutt (of India), and the University of Durham, and letters of thanks were ordered to be sent. The following books were recommended for purchase:—(General Fund)—Roscoe and Schorlemmer's 'Treatise on Chemistry'; (Hanbury Fund)—De Candolle's 'Géographie Botanique.' Some conversation took place with regard to the appointment of the Evening Meetings Committee.

Mr. Churchill asked if it were really desirable to close the library in the evenings during the months of August and September.

The President said that no practical inconvenience was found to arise from so doing.

Mr. Betty remarked that the arrangements recommended by the Evening Meetings Committee would be reconsidered at the end of a year.

Some remarks having been made respecting the publication of the Evening Meeting papers in the Journal.

Mr. Atkins observed, though it did not strictly arise out the report of the Committee, that he had been much gratified by the series of the articles appearing in the Journal, under the heading "The Month." He was quite sure that he was only expressing a general feeling in so speaking.

The President said he quite concurred.

The report of the Committee was then adopted unanimously.

House.

The Report of this Committee included nothing beyond trifling details of house management, cleaning, and minor repairs. It was received and adopted.

Law and Parliamentary.

The report of this Committee was lengthy and important. The first portion stated that a Sub-Committee had considered the form of cautionary letter to be sent to persons accused of infringing the Pharmacy Act, and had submitted an amended form, but the Committee had desired the Sub-Committee to further consider the matter.

The Solicitor had sent in his usual report as to matters which had been placed in his hands, in some of which proceedings are still pending.

In the case of John Jones, 197, Westminster Road, Kirkdale, Liverpool, the penalty of £5 and costs had been paid into Court.

In the case of Edmund Mainprize, of 64, High Street, Bridlington, proceedings had been stayed upon payment of costs, an undertaking having been entered into by the defendant not again to violate the provisions of the Act of Parliament.

Several cases of alleged infringement of the Pharmacy Act had been brought under the notice of the Committee, the details of which were reported.

A case of laudanum being sold by an unregistered person under a patent medicine stamp had been considered by the Committee, and it was recommended that the legality of such sale should be tested.

The Committee also recommended that hydrate of chloral be placed in part 2 of schedule A. to the Pharmacy Act, 1868.

The Chemists and Druggists' Trade Association had forwarded a copy of a resolution passed by the Law Committee of that body to the following effect:—"That this Committee regrets the action which the Council of the Pharmaceutical Society has thought best to adopt in reference to cases of illicit trading, evidence of which has been supplied by this Association, particularly the resolution of the Council by which it decided to give the Registrar power to warn in all cases of infringements without receiving the instructions of the Council in each case."

On the motion that the report be received,

Mr. Bottle moved as an amendment:

"That the report and recommendations of the Law and Parliamentary Committee be received with the exception of the copy of resolution annexed to the letter of July 13th, from the Secretary to the Chemists and Druggists' Trade Association."

It seemed to him that it was not pertinent to the discussion which had previously taken place; and he did not think it quite courteous to the Council.

Mr. Rimmington seconded the amendment.

The President said he should be sorry if the amendment were pressed. The resolution come to by the Association seemed a very natural one, and probably the suggestions now thrown out by the Law and Parliamentary Committee would very much remove the objection which was felt by the Trade Association, which chiefly arose from the fact of the Society not availing itself of information which had been very difficult to obtain. It was thought at the Committee meeting, on the previous evening, that some means might be found for utilizing this information.

Mr. Sandford thought Mr. Bottle was perfectly in order, inasmuch as the resolution was addressed to the Council, and had no business to have been laid before the Committee.

Mr. Betty also thought it would be quite out of order for the Council to receive as a portion of a report from a committee, any matter which had not properly come before that committee.

The Secretary said he should like to know for his future guidance, whether all letters addressed to the Council must be submitted to it in the first place; because if he were not allowed to bring such letters before the Committee first, in some instances inconvenient delays would arise.

The President said it was the usual custom to lay such letters before the Parliamentary Committee.

Mr. Hampson regretted that Mr. Bottle had brought forward this amendment. The Committee of the Trade Association was simply exercising the privilege of commenting on the action of another body, and he was quite sure that in so doing it was only endeavouring to carry out what it thought best, without reflecting in any manner on the Council. He was quite sure there was no *animus* on the other side, and he hoped there would be none shown by the Council. The action of the Trade Association was no doubt a delicate one, but the information which had been furnished in respect to illegal trading had been very useful.

Mr. SANDFORD thought it was a pity to discuss the merits of the question. It seemed to him purely a matter of form, whether the Council would be in order in taking this resolution from a Committee to which it had not been addressed.

Mr. HAMPSON said he thought he was in order in speaking to the amendment which he hoped would be withdrawn.

Mr. CHURCHILL also hoped that Mr. Bottle would see his way to withdraw the amendment. It seemed to him that it was necessary for the Trade Association to pass a resolution of some kind, and a more polite one could scarcely have been passed. When a body went to some expense and trouble in getting up information, it was only natural to regret that it was not made full use of. However he was pleased to think that the debate at the last Council seemed to have paved a way for better regulations as to the treatment of cases of infringement in future.

Mr. SHAW said this seemed a very technical question whether this resolution should be received as embodied in the Committee's report, because if it were omitted there it must come before the Council, when the question of sending a cautionary letter in each case might be discussed.

The PRESIDENT said the letter could not raise the question. It was open to any member of the Council to bring it forward again, but it was hardly desirable to do so, considering how thoroughly it was discussed last month.

Mr. ATKINS said he could not of course tell what had been the practice of the Council, but in similar bodies he knew it was usual to refer letters to a Committee for consideration. The address upon it was purely accidental.

The SECRETARY said that the letter was addressed to him and consisted of two portions. The first portion of the letter requested that a resolution, a copy of which was annexed to the letter, should be submitted to the Council, and the other portion of the letter reported a case of infringement of the Pharmacy Act. The letter had therefore been brought, as was usual with all letters containing such information, before the Committee.

Mr. OWEN thought the Council was really making too much of this point. It did not matter whether the resolution came before the Committee or the Council.

Mr. SCHACHT thought the resolution referred to was a most natural one, but it did not follow that the Council was bound to record it on its own minutes, for which he saw no necessity.

The amendment was then put, when 8 votes were given for it, and 8 against.

Mr. BOTTLE said he would withdraw the amendment rather than place the President in the position of having to give a casting vote.

The Council then went into Committee to consider the details of the various cases referred to in the report of the Committee.

After a long discussion, the report and recommendations of the Committee, with one exception, were received and adopted.

CHLORAL HYDRATE.

It was then resolved, on the motion of Mr. SHAW, seconded by the VICE-PRESIDENT—

"That the proceedings in reference to placing Chloral Hydrate on Schedule A. be postponed until the meeting of Council in October next, to afford an opportunity to add other articles if necessary."

COUNTER PRACTICE.

Mr. HAMPSON moved, and Mr. ATKINS seconded, a resolution to the effect that the Council defend, if necessary, a member of the Society, who had been threatened with prosecution under the Apothecaries Act.

Mr. OWEN said he was on the best possible terms with the medical profession, amongst whom he had moved since he was ten years old, but he must confess that a large part of his business was done over the counter. He considered he was doing what he was entitled to do, and that any other member who was doing the same ought to be supported.

Mr. SHAW also supported the motion.

The VICE-PRESIDENT quite concurred with the proposition, but it occurred to him that some difficulty might arise if both the Trade Association and the Society undertook the defence. He did not know how the two solicitors could act together. He had taken the trouble to go through some of the early numbers of the *Lancet*, and found the editor was strongly in favour of the position which chemists were now assuming; in fact, he went much further. The Vice-President proceeded to read extracts from the *Lancet*, written in 1826, which spoke of the Apothecaries Act as being "projected by avarice, supported by intrigue, and enacted by ignorance," and said it could have no other effect than to "excite unmixed contempt for its authors."

The PRESIDENT doubted if these extracts were relevant at the present time.

The VICE-PRESIDENT thought they were; the Act having been passed in 1815, the writers were quite as likely to understand it in 1826 as fifty years later, during which period no action had been taken to enforce it as it was now sought to do. The *Lancet* defined the position of chemists at that time, saying they were accustomed to prescribe and even to visit patients.

The PRESIDENT said that was not the law.

The VICE-PRESIDENT said it was the opinion of men who ought to know. If the case now under consideration were a good one the Council was bound to defend it.

Mr. ROBBINS agreed that the rights of chemists and druggists ought to be supported. The question had often come before the Council and he had always voted against it being taken up, because it had hitherto been always connected with some doubtful case, and he felt that if the Council undertook to defend a man who had been accustomed to prescribing, in the general sense, it would be doing mischief. But in this case the chemist seemed to be conducting his business properly, according to the practice of the majority of the trade, and he ought to be supported.

Mr. SCHACHT hoped he would be forgiven if he endeavoured to check the enthusiastic career of the Council at the present moment, but he sincerely hoped it would take further time to consider before deciding on such an important step. There was, it was true, on the minutes an abstract resolution that the Council would be prepared to entertain a good case where vexatious proceedings were threatened. He had opposed that at the time, and now it came to a concrete proposition that an individual case should be taken up he must oppose it, because it appeared to him that the Council would be taking up the indefensible position of justifying what could not be justified,—the prescribing for disease by those who were not qualified so to do. He did not say whether men were right or wrong in so doing, but legal authorities agreed that in so doing they were acting against the law, and it seemed to him to be a great mistake to set themselves against the law as interpreted by the best authorities. If one man were defended all ought to be, but though some of his neighbours and friends did the same, as Mr. Owen said he did, they said to him that they knew they were offending against the law, and if they were proceeded against they were prepared to take the consequences. That seemed to him a manly course for those who knew they were legally wrong, though they might consider themselves morally in the right; and he did not see that they had any right to throw the defence on the Society. Those who so acted reaped the benefit, the Society did not, and it ought not to be involved in the question. He admitted it was very hard on gentlemen to be put in the position of having to do things which were illegal, or which many persons deemed illegal, but he considered the proper course was to try and obtain a more favourable definition of their position, and for that purpose he proposed to bring forward a motion in October that the Council communicate with the Apothecaries' Company, and endeavour to arrive at some amicable arrangement as to the limits which should be laid down as being unobjectionable.

Mr. Betty said this matter would not be decided by the personal influence of medical men, or their amicable relations with particular chemists and druggists. He hoped the Council would not take any step without being well advised in the matter. The chemists and druggists' position as prescribers of medicine was ambiguous, especially in the face of Baron Bramwell's opinion, and he hoped the Council would adopt Mr. Schacht's proposal, and at any rate do nothing at present.

Mr. Bottle said he would not occupy many minutes, especially as the Committee had sat until half-past 10 on the previous night in considering this and other matters; but he did think the time was now come when it was the duty of the Council to endeavour to settle on a firm basis what were the rights of chemists and druggists. Whether that was to be done by defending a particular case in the County Court, and if necessary, in a superior court, or by bringing the matter before the House of Commons, he thought it was the duty of the Council to look the matter fairly in the face, and he was therefore prepared to support the motion, but he could suggest a modification in its terms to the following effect—

"That this Council authorizes its Solicitor at his discretion and at the expense of the Society to defend the gentleman referred to in the threatened prosecution by the Apothecaries' Society."

After some conversation, Mr. Hampson and Mr. Atkins agreed to accept this form.

The President said the real question was whether the Council was prepared to defend the case at all. He must remind the Council that it had for many years protested against medical practice by chemists and druggists, and not a single resolution would be found on the minutes which either encouraged or sanctioned it. He could not himself agree that it was right for the Society to protect a practice which he could only look upon as illegitimate. Chemists and druggists had no education, properly speaking, in the practice of medicine, and under these circumstances he did not see how they could defend the system objected to, although he admitted its universality, and its public convenience. He looked rather to the good sense of the medical profession than to any decision in a court of law for protection.

Mr. Hills agreed with the President. It was very easy to run into law but more difficult to get out of it. It was very difficult, if not impossible, to define the proper limits of counter practice, and he should like much more consideration to be given to this particular case before the Council pledged itself to defend it.

Mr. Shaw was glad Mr. Hampson had accepted Mr. Bottle's suggestion, especially, as Mr. Flux had already stated that he had no doubt of the issue of any case that went into court for *bonâ fide* counter practice.

Mr. Cracknell said he had many old customers who would feel highly offended if he refused to prescribe for them; but at the same time he felt that he did so entirely on his own responsibility, and if he were attacked he should not think of applying to the Society for assistance. He did not consider it right for such a body to undertake the defence of a practice which he could not help thinking was somewhat doubtful, and he should, therefore, vote against the motion.

Mr. Churchill said he was surprised that no reference had been made in this discussion to their 3000 or 4000 constituents, whose interests were affected. Personally, they all agreed that the less prescribing and the more dispensing they did the better, but it seemed to him that the course some medical men were now taking would tend to crush out the chemists and druggists altogether, for they would not be allowed to prescribe or to dispense. He did not wish to see any extension of counter practice, but the case under discussion seemed to him as plain and simple a one as could be imagined, and he thought it was the duty of the Council to defend it. He should be quite prepared to support Mr. Schacht's proposal, when he brought it forward, for endeavouring to make an arrangement with the Apothecaries' Society; but it appeared to him that if they gave up entirely the right of counter practice they would have little chance of obtaining from medical men the right of dispensing. The Society must go into Court and defend the case, because the Solicitor of the Society had information which it would be difficult to obtain elsewhere, and if the history of the saving clause with regard to the rights of chemists which was introduced into the Apothecaries Act could be traced it would no doubt be very useful. The opinion of Baron Bramwell would be very likely to influence the county court judges until a decision of the Court of Queen's Bench was obtained. But whatever the opinion of the judges might be it seemed to him pretty clear that if the decision was adverse chemists would soon have no trade at all, and in a hundred years there would be no one left in the trade.

Mr. Hampson, in reply, said the Council must really face the difficulty, and the difficulty was this, that a certain portion of the medical profession were determined to put a stop to what was called counter practice, though for time immemorial up to a recent date, there had been been no attempt to interfere with what they considered their legitimate rights. This was an attack upon the trade and the public as well, and it was the duty of the Council, representing both, to take up the matter.

On the motion being put, the following voted:—

For.—Messrs. Atkins, Betty, Bottle, Churchill, Gostling, Greenish, Hampson, Owen, Rimmington, Robbins, Savage, and Shaw—12.

Against.—Messrs. Cracknell, Hills, Schacht, and Williams—4.

The motion was therefore carried.

Reports of the Council Proceedings.

The President read the following letter which he had received from the Editor:—

"Pharmaceutical Society of Great Britain,
"17, Bloomsbury Square, London, W.C.,
"July 30, 1877.

"Journal Department.

"To the President of the
"Pharmaceutical Society of Great Britain,

"Sir,

"In the report of the proceedings of the Council published in the *Pharmaceutical Journal*, of the 7th inst., statements are represented to have been made by some members of the Council which appear to require notice, since they are not in accord with the facts of the case; I refer to the observations of Mr. Hampson and Mr. Sandford respecting the official report of the Council proceedings.

"In the first place, Mr. Hampson is represented as urging that it was impossible for the Council reporter to give an absolutely genuine report of the proceedings, and the reason given by Mr. Hampson for this allegation appears to have been expressed in the following words:—

"'After he [the Council's own reporter] had written down what he considered to be important the remarks of each speaker were sent to the Editor, and were put into type, and were then sent to the town members and they had an opportunity—a very pleasant one he might admit —to amend, to improve, or to add to, or possibly to suppress a portion of the report.'

"As regards the procedure systematically followed with the reports of the Council's proceedings, the first part of Mr. Hampton's statement is substantially correct, but the interpretation which he offers of that procedure is erroneous, and I therefore think it necessary to state that though a proof of the reported remarks of each town member is sent out on Friday morning no opportunity is given for any amendment of the report beyond such verbal corrections as will not affect the general tenour and purport of the speaker's remarks. Neither is any opportunity furnished for adding to or suppressing any portion of the report as it is handed to me by the official reporter.

"The assumption that the report of the Council's proceedings is altered, supplemented, and in part suppressed while passing through the Editorial department is one entirely without foundation in fact, and, as regards the performance of my duties as Editor, I think it necessary to point this out, since it appears to be solely upon the basis of that assumption that Mr. Hampson expressed the opinion that the official report now published in the Society's Journal was not such a report as he desired should be published.

"Mr. Sandford's remarks on this subject may also be read as indicating a misapprehension similar to that evinced by Mr. Hampson, for he is reported to have said, 'The reporter took notes and sent them to the Editor, who published just what he liked, and the members of the Council themselves had no authority to interfere.' So far from attempting to exercise any such censorship over the report of the Council proceedings, I have always considered it to be imperative on me to publish whatever is handed to me by the Council's official reporter. I have always acted upon that principle in regard to these reports, and have uniformly assigned that as my reason for declining to adopt alterations which appeared to me to be beyond mere press corrections.

"As regards the advantages enjoyed by some of the members of the Council in having proofs of their remarks submitted to them, it is entirely incorrect to suppose that this proceeding involves anything unfair to others, or that any distinction is made in this respect between town and country members of the Council; as, in fact, both have enjoyed this advantage, and it has always been open to all; the only real difference arising from the inaccessibility of members of the Council who are not on the spot at the time available for the purpose. On numerous occasions country members of the Council have stayed in town for the purpose of seeing proofs of their remarks, but it would be obviously useless to send proofs to them in distant parts of the country.

"In addressing you on this subject I do not desire to raise any further discussion, but have done so because it appeared to me that the remarks I have referred to conveyed some reflection upon me in my position of Editor, and that it was desirable on that account, so far to place on record my individual protest against them. I shall, however, feel obliged if you will exercise your own discretion in deciding whether or not it is desirable to take any official cognizance of my letter.

"Believe me,

"Yours very truly,

"BENJ. H. PAUL."

Mr. SANDFORD said he thought Dr. Paul had unintentionally misrepresented him. What he meant to convey was, as he believed the context would show, that the *Council* exercised no control over the report.

Mr. HAMPSON also referred to the subject, and said he must adhere to what he had before stated; and he must add that in his own case he had made more than verbal corrections, though he had always done so in perfect harmony with the opinions he had expressed at the Council. He also again expressed the opinion that in some cases gentlemen were not reported so fully as those who had heard the proceedings would have expected.

THE PHARMACEUTICAL CONFERENCE.

The President said it had been suggested that the Council should send delegates to the Pharmaceutical Conference to be held at Plymouth, as was done by several other bodies. He would therefore propose that all members of the Council who intended attending the Conference should give their names and be appointed delegates. The duties would be purely honorary, of course.

The President, the Vice-President, and Messrs. Atkins, Betty, Cracknell, Greenish, Owen, Robbins, and Schacht were thereupon elected delegates accordingly.

GENERAL PURPOSES.

The Professors' Reports, etc.

Professor Redwood had presented a very satisfactory report as to the result of the examinations for the prizes, the result of which will be found below.

Professor Bentley reported in very favourable terms of his class, the average number of marks obtained by the first six candidates having on no previous occasion been so high.

For the botanical prize there had been three herbaria sent in, the first of which contained 715 specimens; the other two were also very commendable.

Professor Attfield also had reported in very satisfactory terms as to the attendance in the practical chemistry class, and the good conduct of the students.

The examiners who had been appointed to conduct the examination for the "Council Examination Prizes," had also made their report, and the result of the competition will be found below.

PRIZE AWARDS.

The following awards were made on the recommendation of the General Purposes Committee:—

Chemistry and Pharmacy.

[Five months' course.]

Bronze Medal	Robert Henry Parker.
Certificate of Merit	Robert Brown Betty.

[Ten months' course.]

Silver Medal	George William Bullen.
Certificates of Honour	Robert Henry Parker. Geo. Fredk. Gutheridge. Rawson Parke Francis.
Certificates of Merit	David Avison. Robert Brown Betty.

Botany and Materia Medica.

[Five months' course.]

Bronze Medal	Robert Henry Parker.
Certificates of Merit	Stewart Hardwick. Robert Brown Betty.

[Ten months' course.]

Silver Medal	Robert Henry Parker.
Certificates of Honour	George William Bullen. Geo. Fredk. Gutheridge. Henry Peirson. David Avison. Rawson Parke Francis.

Practical Chemistry.

Silver Medal	Robert Henry Parker.
Bronze Medals	Geo. Fredk. Gutheridge. Rawson Parke Francis.
Certificates of Honour	George William Bullen. William Ralph Atkins. William Bevan.

Certificates of Merit............	David Avison. Walter Barber Tuck. Fredk. Wm. W. Corden.

Botanical Prize.

Silver Medal..........................J. T. Creswick Williams.
Bronze Medal........ ....Thomas Francis Elton.
Certificate of Honour...............John William Ellis.

Council Examination Prizes.

Pereira Medal (silver); and Books value £5, presented by Mr. T. H. Hills.

George William Bullen.

Pharmaceutical Society's Medal (silver); and Books value £3, presented by Mr. T. H. Hills.

Henry George Greenish.

Pharmaceutical Society's Medal (bronze); and Books value £2, presented by Mr. T. H. Hills.

William Inglis Clark.

In reply to questions from Mr. Shaw and Mr. Schacht, The PRESIDENT said there had been thirteen competitors for the Pereira Medal, twelve in London, and one in Edinburgh; the majority of the London men being practically at work in the laboratory, or studying in the school. He then congratulated those members of the Council whose relatives figured so honourably in the prize list.

Mr. GREENISH said he should shortly take an opportunity of again bringing before the Council the question, whether the papers for the prize examinations could not be set by some competent persons other than the Society's professors. He should like, also, to see the subject of the Pereira Medal further considered, for he was satisfied from an inspection of the last paper on practical chemistry, that the questions were more calculated to encourage cramming from text books than to test the real practical abililty of the student.

JACOB BELL MEMORIAL SCHOLARSHIPS.

The Committee appointed to award, subject to the approval of the Council, these Scholarships reported that the Examination was held on July 2nd, when fourteen Candidates competed, viz., London, 5; Birmingham, 1; Boston, 1; Bristol, 1; Colchester, 1; Liverpool, 1; Macclesfield, 1; Manchester, 1; Nottingham, 1; Portsmouth, 1.

The mottoes adopted by the two Candidates who had obtained the highest number of marks, were "*Facta non verba*" and "*Veritas*," and the Committee recommended that the Scholarships should be awarded to the competitors adopting these mottoes.

The Committee had opened the envelopes bearing these mottoes, and the successful candidates were found to be Henry Allen, London, and John Graham Sangster, of Portsmouth.

The report and recommendation of the Committee were adopted.

The following were declared to be the scholars for the Session 1877-78:

Henry Allen.
John Graham Sangster.

The PRESIDENT thought the result of this Examination was very gratifying. Mr. Henry Allen was a pupil of Mr. Owen's, his father being a printer's reader, and the father of Mr. Sangster was, he understood, a stoker or engineer on board H.M.S. *Spitfire*.

Mr. OWEN expressed his gratification at the success of Mr. Allen who had given him the greatest satisfaction in every respect.

SUPERINTENDENTS AND DEPUTY SUPERINTENDENTS OF WRITTEN EXAMINATIONS.

The following Superintendents and Deputy-Superintendents of written examinations at the various local centres were appointed for the ensuing year:—

SUPERINTENDENTS OF EXAMINATIONS.

Aberdeen	Davidson, Charles.
Aberystwith	Wynne, E. P.
Barnstaple	Goss, Samuel.
Berwick-on-Tweed	Carr, William Graham.
Birmingham	Southall, William.
Boston	Fowler, W. R.
Brighton	Gwatkin, James Thomas.
Bristol	Stoddart, W. W.
Cambridge	Deck, Arthur.
Canterbury	Bing, Edwin.
Cardiff	Procter, Samuel J.
Cardigan	Jones, J. E.
Carlisle	Thompson, Andrew.
Carmarthen	Davies, R. M.
Carnarvon	Lloyd, William
Cheltenham	Smith, N.
Chester	Grindley, W.
Colchester	Shenstone, J. B. B.
Darlington	Robinson, A. F.
Doncaster	Dunhill, W. W.
Dorchester	Evans, A. J.
Douglas, I. of Man	Brearey, W. A.
Dumfries	Allan, William.
Dundee	Hardie, James.
Edinburgh	Mackay, John.
Exeter	Delves, George.
Glasgow	Kinninmont, A.
Guernsey	Arnold, A.
Hereford	Jennings, R.
Hull	Bell, C. B.
Inverness	Galloway, G. R.
Jersey	Ereaut, J., jun.
Leamington	Jones, S. U.
Leeds	Reynolds, R.
Leicester	Cooper, Thomas.
Lincoln	Maltby, Joseph.
Liverpool	Abraham, J.
London	Taylor, Geo. Spratt.
Lynn	Atmore, George.
Macclesfield	Bates, W. I.
Manchester	Wilkinson, W.
Newcastle	East, Rev. W. B.
Northampton	Bingley, J.
Norwich	Sutton, Francis.
Nottingham	Atherton, J. H.
Oxford	Prior, G. T.
Peterborough	Heanley, M.
Plymouth	Balkwill, A. P.
Portsmouth	Rastrick, J. L.
Preston	Barnes, J.
Reading	Hayward, W. G.
Salisbury	Atkins, S. R.
Scarborough	Whitfield, J.
Sheffield	Ward, William.
Shrewsbury	Cross, W. G.
Southampton	Dawson, O. R.
Stafford	Averill, J.
Swansea	Brend, Thomas.
Taunton	Prince, Henry.
Truro	Serpell, S.
Worcester	Virgo, Charles.
York	Davison, R.

DEPUTY-SUPERINTENDENTS OF EXAMINATIONS.

Aberdeen	Kay, James Petrie.
Aberystwith	Davies, J. H.
Barnstaple	Symons, Charles.
Berwick-on-Tweed	Carr, Robert.
Birmingham	Churchill, Walter J.
Boston	Thomas, F.
Brighton	Savage, William Wallace.
Bristol	Schacht, G. F.

Cambridge	Church, H. J.
Canterbury	Amos, D.
Cardiff	Bartleet, John.
Cardigan	Evans, E. C.
Carlisle	Hallaway, John.
Carmarthen	Davies, R. M., jun.
Carnarvon	Hughes, Richard.
Cheltenham	Barron, William.
Chester	Williams, Thomas.
Colchester	Cordley, William. B.
Darlington	Hutchinson, E.
Doncaster	Shaw, H. W.
Dorchester	Durden, Henry.
Douglas, I. of Man	Cannell, C.
Dumfries	Carruthers, R. B.
Dundee	Laird, William.
Edinburgh	Ainslie, William.
Exeter	Lake, J. H.
Glasgow	Davison, T.
Guernsey	Collenette, A.
Hereford	Parkin, T.
Hull	Baynes. J.
Inverness	Galloway, G.
Jersey	Ereaut, J.
Leamington	Davies, H.
Leeds	Smeeton, W.
Leicester	Cooper, Henry.
Lincoln	Battle, J. S.
Liverpool	Shaw, John.
London	Bremridge, Richard.
"	Knapman, J. W.
"	Holmes, E. M.
Lynn	Willis, C.
Macclesfield	Wood, R.
Manchester	Wilkinson, G.
Newcastle	Usher, J.
Northampton	Mayger, W. D.
Norwich	Corder, O.
Nottingham	Fitzhugh, R.
Oxford	Thurland, H.
Peterborough	Buckle, F. G.
Plymouth	Hearder, H. P.
Portsmouth	Rastrick, R. J.
Preston	Barnes, L. R.
Reading	Bradley, Charles.
Salisbury	Orchard, E. J.
Scarborough	Fryer, C.
Sheffield	Maleham, H. W.
Shrewsbury	Cross, W. G., jun.
Southampton	Spearing, James.
Stafford	Averill, H. A.
Swansea	Brend, K. B.
Taunton	Gregory, G. H.
Truro	Richards, J. E.
Worcester	Lunn, Thomas.
York	Cooper, Thomas.

Provision for Orphans.

Mr. Robbins next brought forward the following motion, of which he had given notice—

"That the benefits of the Benevolent Fund be further extended by making a provision for the orphan children of deceased Members or Associates of the Society, according to the intention of the Founders as expressed in the Charter of Incorporation.

"That the surplus income derived from subscriptions be appropriated to the benefit and advancement of such children by the purchase of admissions into Orphan Institutions, or in any other way the Council may deem desirable.

"Candidates for admission by purchase to be nominated by the Council. The election to be by voting papers, and to take place at the same time and in the same manner as the Election of Annuitants."

In proposing this resolution he wished to remove the misconception which existed amongst some members with regard to the position and working of the Benevolent Fund. Whenever a proposal was made for extending the benefits of this charity in any way, a great deal of alarm was excited, and they were cautioned against jeopardizing the safety of the annuitants. Now this arose from total misconception, because they were already as safe as it was possible to make them. The funded capital had been accumulated for that very purpose, and an annuitant once elected had a claim on that fund as long as he lived, or as £30 existed to satisfy that claim. This explanation he generally found re-assuring as regarding the annuitants, but then it was said it would never do to jeopardize the safety of the invested capital. But it appeared to him that the invested capital was as difficult to jeopardize as the position of the annuitants. Suppose for instance the subscriptions were to totally fail—a supposition almost too ridiculous to be urged; in that case the interest of the invested capital would not be sufficient for the present moment, and at first would draw somewhat heavily on that capital, but in the course of a very short time, by the natural process of deaths, the number of annuitants would be reduced sufficiently for the interest to pay all charges; and any one who would take the trouble to work out the problem would be astonished to find how little the invested capital would suffer by such a process. Having reached that point, every annuitant who died would afford capital again for re-investment, so that by the time the last had paid the debt of nature the invested capital would be as much or more than it was at the time of starting. All fears therefore as to the safety either of the annuitants or of the invested capital were purely imaginary. The Benevolent Fund had taken thirty-five years to attain its present position, and it was capable, under good management, of doing whatever it was necessary to accomplish in the way of charity. The time had now arrived, therefore, when some provision should be made for the orphan children of deceased members or associates of the Society. This was particularly mentioned, amongst other things, by the founders of the Society; they mentioned members, associates, their widows and orphans; the first three had already been dealt with, but the fourth had not, but the time had now arrived when the Council ought to complete what was intended by the founders. To accomplish that would be to crown the edifice, the foundation stone of which was then laid. To carry out this proposal there were no difficulties to be encountered at present nor any liabilities to be incurred in future. This was a different proposal to the one he had urged some few years ago, viz., to increase the number of annuitants. In creating an annuity they could not say what liability would be incurred; it might last for one year or twenty, at a cost of £30 or £600, but in electing a child to be provided for in an institution there was no liability incurred. There was surplus money derived from subscriptions already in hand, and according to the practice hitherto adopted that surplus would be taken to Threadneedle Street, and in the course of twelve months there would be returned about $7\frac{3}{4}d.$ in the pound to expend in charity. That, no doubt, in the early history of the Society, was quite right, but at the present time it was quite wrong. All the subscriptions sent in should be used if there was need for them; if not, and no reason could be shown why there should be any need for them twenty years hence, he could not see why the Council should try to build up a great fund, so that chemists twenty years hence should have no need to put their hands into their pockets. Again, in spending the whole of the subscriptions, they would not prevent the Fund from increasing. Donations and legacies would have to be invested as heretofore. Only recently, a gentleman gave Mr. Bremridge fifty guineas for the Fund; and such donations must be invested, and would go to increase the invested capital whether advisable or not, and he must say that to such a society a large invested capital was sometimes mischievous. Some four years ago, when making inquiries on this subject, one secretary of a benevolent institution told him the great difficulty he had to contend with was the large amount of their invested capital, because people would not subscribe when there was so much money in hand. He thought, therefore, the time was come when the Council ought to carry out the intentions of the founders. Looking over the obituary in the Journal, one could not but be struck with the large number of deaths amongst chemists and druggists in the very prime of their existence, whilst their career had yet been too short to make proper provision for those dependent upon them for support. The widows of such persons would frequently rather suffer many privations than ask for a casual grant of £10 or £15.

The PRESIDENT here said he believed they were all of one mind on the abstract question, and suggested that Mr. Robbins should confine his remarks to the question of what was the best way of carrying out the idea.

Mr. ROBBINS continued that he was just going to observe that such persons would welcome the privilege of having a child provided for, and ultimately sent out into the world fitted to fight the battle of life successfully.

The PRESIDENT said all were agreed as to that, he believed, but the question was whether it would be advisable to have elections with voting papers.

Mr. ROBBINS said that was a matter of detail which he was quite willing to refer to a Committee.

The PRESIDENT remarked that the Council had over and over again expressed its desire to make provision for orphans.

Mr. ROBBINS said it had not practically done anything, and he thought it was quite time to begin. There was now about £400 or £500 a year surplus, and if such a plan were adopted he believed the subscriptions would soon be doubled. However, he was quite willing to withdraw the last part of the motion.

Mr. BOTTLE, in seconding the resolution, said Mr. Robbins had left but little for him to say. He was willing to admit a certain amount of good service had been done for orphan children, but there was an opening for more to be done. At the end of every year there was a balance of subscriptions, which under the bye-laws had to be invested, and Mr. Robbins' notion was that the Council should take care to expend that balance rather than invest it. Observations sometimes reached them that posterity had done nothing for them, and they did not see why they should do anything for posterity in heaping up a lump of money for benevolent or any other purposes; but the position taken up by Mr. Robbins would meet that, because it gave an opportunity of doing something for posterity, not by heaping up money, but by taking care of orphans and rendering them useful members of society. The Council knew that as a rule the country practice of a chemist was not a money making business, as might be seen by the advertising columns of the Journal, offering businesses for disposal, the returns of which were £200, £300, or £400 a year,—and what could there be in the way of profits from such establishments? It must follow that there was a large number of people, who, if they managed to make a living for themselves, could not leave much behind them, and though the widow might not come and ask for an annuity she would be much relieved by having one of her children provided for.

The VICE-PRESIDENT doubted the advisability of establishing a separate fund for the purpose of providing for orphans, and thought it would answer every purpose to apply the funds at disposal from time to time in this way.

The PRESIDENT said Mr. SANDFORD had been obliged to leave, but he had left the following observations on this subject which he would read:

"It appears to me that these resolutions are unfortunately framed. I do not for a moment object to the granting of such relief as they propose, but the Council already possesses full power to grant it.

"Clause 1 of the regulations, describing the 'objects of the Fund,' states expressly that 'occasional grants' may be afforded to 'orphan children.'

"Clause 10 empowers the Council, after due investigation to 'decide on the amount and character of the relief to be afforded.'

"Clause 33 specially sets forth that 'the Council may, if they think fit, provide a home by purchase in one of the public asylums for orphans.'

"I believe that in the amended regulations, to come into operation in 1878, this 33rd clause is more prominently put in an earlier part of the regulations.

"The allusion to 'the intention of the founders' is altogether superfluous as the whole rules are framed, and the whole money subscribed, to carry out the objects proposed in the Charter and perpetuated by the Acts.

"To speak of 'the surplus income' being applied to this or that special purpose appears to be unreasonable. All relief granted under the regulations must be a legitimate application of the Fund, and there can be no surplus until the end of the year when the Council has relieved such cases as it had the means, and deemed it right to relieve, whether by grants to distressed men, widows, or orphans.

"Mr. Robbins' third proposition is undoubtedly intended to excite a more general interest in the Benevolent Fund, and thereby to obtain for it increased support. Those who are of opinion that the present system of electing pensioners is open to abuse, entailing unnecessary expense on the candidates and often ending in the election of the least needy and deserving, will scarcely deem it wise to adopt this system of relieving orphans.

"For myself, I am not prepared to support this view, I believe the Council, having full particulars of all the cases before them, could select better than the general body of subscribers, but I think the popularity given by the general voting outbalances the occasional mistakes thus arising, and, bringing in a large income, enables the Council to relieve more freely and extensively than it might otherwise be able to do.

"One serious objection to the proposal seems to me to be, that it would render the relief granted only periodical, instead of available when most needed. For instance: a child becomes an orphan, a month after the election proposed by Mr. Robbins; no other election will occur for eleven months, by which time this child may have passed the age at which he could be admitted to any Orphan Asylum.

"It may be assumed that if the power to grant sums for the purpose advocated by the present proposal be once vested in the Society at large, the Council will for ever relinquish its privileges in the matter, beyond the decision as to the number of children who may be thus assisted and the merits of the candidates. I take it that, although not so stated in words, this would be the natural result.

"I presume Mr. Robbins would not advertise for needy orphans, any more than we now advertise for pensioners: such a course would have what is called a pauperizing effect. The Committee studying the applications for aid from month to month could select as many, or perhaps more than as many, cases in which this kind of assistance would be a great boon as the Fund could afford to relieve.

"Knowing it to be the wish of the Council to give such aid more frequently than hitherto, the Committee would naturally do this; but we are not now to begin *de novo*.

"At the very last Council meeting a sum of fifty pounds was granted 'in aid' for the admission of an orphan. Query.—If these resolutions be passed will the Council have the power to make 'grants in aid' hereafter?"

Mr. Owen said as far as he could gather, Mr. Robbins desired an extention of the principle which had been hitherto acted on, not that they should in every case durchase the admission of an orphan into an asylum, which would cost a great deal of money. He should recommend that the principle acted upon last month so successfully, as he had already reported, should be continued, since it stimulated exertion on the part of those who were specially interested; and £50 or £60 in each case would then be found sufficient.

Mr. Betty said this was a very important subject, and with Mr. Robbins' permission, as several members had left, he would move the adjournment of the discussion to October next, when he should be prepared to state his views upon it.

This motion was seconded by the Vice-President and agreed to.

The Secretary suggested that Mr. Robbins should also bring forward a motion for increasing the amount of annuities by £5 annually in the case of those over 60 years of age, and by £10 to those over 70 years, in view of the increased cost of living since the amount of the annuities was fixed.

Mr. Robbins said this matter had occurred to him, but it was quite distinct from the subject of his motion, and he thought it better to deal with one thing at a time.

Mr. Schacht moved, according to notice, that a sum of money be voted for the purpose of obtaining a report of the proceedings at the Conference.

The motion was agreed to.

The consideration of a further motion that the travelling expenses of country members attending Committees should be defrayed by the Society was deferred.

Report of Examinations.

July, 1877.

ENGLAND AND WALES.

	Candidates. Examined.	Passed.	Failed.
Major 12th	12	9	3
„ 13th	11	2	9
„ 18th	8	4	4
„ 19th	7	3	4
	— 38	—18	—20
Minor 12th	19	12	7
„ 13th	16	7	9
„ 18th	22	15	7
„ 19th	22	11	11
„ 20th	26	8	18
	—105	—53	—52
Modified 13th	1	1	0
	144	72	72

SCOTLAND.

	Examined.	Passed.	Failed.
Major 12th	3	2	1
Minor 12th	9	7	2
„ 13th	10	7	3
	—19	—14	— 5
Modified 13th	1	0	1
	23	16	7

Preliminary Examination.

Candidates. Examined.	Passed.	Failed.
251	139	112

Four certificates received in lieu of the Society's examinations:—

2 University of Cambridge.

1 University of Oxford.

1 Royal Colleges of Physicians and Surgeons of Edinburgh.

The Secretary read letters of thanks which had been received from the Bristol Association for specimens for their museum, and from the Chemists' Assistants' Association, London, for the use of the Society's rooms for their meeting.

Provincial Transactions.

BRIGHTON CHEMISTS AND CO-OPERATIVE STORES.

At the latter end of June a meeting of the chemists of Brighton was called at the Town Hall, by Mr. W. D. Savage, President of the Local Association, to consider whether any steps should be taken to meet the existing action on the part of several chemists in the town who are endeavouring to compete with the co-operative stores by selling patent medicines, drugs, etc., at the same prices. This meeting was, after considerable discussion *pro* and *con.*, adjourned for a month in order to give time for further consideration.

On Friday, July 27th, the meeting again assembled, when the following resolution moved by Mr. Vizer, and seconded by Mr. Haffenden was carried *nem. con.*:

"That in the opinion of this meeting any attempt to compete with 'co-operative stores' and 'underselling chemists' by a systematic reduction of prices of patent medicines, drugs, etc., would be injurious to the real interest of the trade, and prejudicial to its position in the eyes of the public. This meeting, therefore, deprecates any such act on the part of the chemists of Brighton."

Review.

Sanitary Engineering (A Series of Lectures given before the School of Military Engineering at Chatham, 1876). By J. Bailey Denton, F.G.S., M. Inst. C.E., etc.

Mr. Bailey Denton's work of more than four hundred pages is far too bulky to receive anything like a detailed review, and moreover, being somewhat of the nature of a compilation of all matter relating to his subject, it does not particularly call for it.

The work is elaborately got up, and is illustrated with numerous and excellent plates; it has also a full chapter of contents, and a good index.

Mr. Bailey Denton treats of his subject in five divisions, and concludes with an appendix containing much valuable information bearing upon what has gone before.

In his preface he expresses the hope that the work will "be regarded not as an attempt at a finished literary production, but as an earnest expression of the views formed during an active professional life;" and as there can only be one opinion of Mr. Bailey Denton's earnestness in all subjects affecting sanitary engineering, so there can be but one opinion of the skill, knowledge, and comprehension with which he has treated of this science in the volume before us.

The first division of the book is concerned with air, and it may not be inappropriate at this time of the year to remind our readers that the air of the Metropolitan Railway between Gower Street and King's Cross contains ·338 per cent. of carbonic anhydride.

Writing of ozone, the author quotes from Dr. Cornelius Fox the opinion that this substance is simultaneously developed with electricity, partly through "the dashing and splashing, the smashing and crashing of the restless waves on the rocky coast." Dr. Fox's expression reminds us forcibly of a famous poem, where 'The Bells,' so far as we remember, behaved somewhat similarly.

After treating of the quantity of air respired by human beings, and of the foreign matters which are regarded in the light of pollution, etc., the author proceeds to consider the danger arising from the inhalation of ground air, associated as it often is with ammonia, carbonic anhydride, sulphuretted hydrogen, and organic matter. There can be but little doubt that malaria and miasma generally arise from the presence in the air of affected districts of certain nitrogenous substances liable to putrefaction. The beneficial influence of the peroxide of hydrogen and other substances generated in the oxidation of volatile oils from pine and eucalyptus trees, in destroying or burning up this malarial matter, is now beyond doubt, and we could have wished that Mr. Bailey Denton had devoted more consideration to this matter in his book.

In some further sections the influence of dry and wet subsoils upon the quality of the superincumbent atmosphere is studied, and it is pointed out that the amount of watery vapour, which in this country is considered most congenial to health, is from 65 to 75 per cent. of saturation.

Water forms the subject to which the second division of the book is devoted, but comprehensive as it is, we can only notice here one point—and one of importance for rural districts, like the country round Hampton Court and Walton-on-Thames, where the question of water supply is a serious one. Although rain water is "often polluted to a dangerous extent by excrementitious matters," and "rarely of sufficiently good quality to be employed for dietetic purposes with safety,"* it is by no means necessarily so, and if properly collected on the roofs, and stored in a manner protecting it from contamination, it compares favourably with deep-well and spring waters in purity and fitness for use. This is the view entertained by Mr. Bailey Denton and Dr. B. H. Paul, whose chemical investigations regarding such waters have lent strong corroboration to this opinion.

The third division of the book includes all sorts of considerations affecting the dwelling. Of the entire death rate of England and Wales, a proportion of one-ninth is due to consumptive diseases alone, and hence nothing can be more important than that proper precautions be taken in regard to the drainage of the site of dwellings. For it has been well established that pulmonary consumption and phthisis often follow the drying of the soil.

In this section, then, drainage and sewerage are well studied, and the modes of treating the sewage of isolated dwellings are described. Beyond this, the subjects of ventilation, water closets, scavenging, etc., receive a detailed account.

The sanitary engineering of towns and villages is a large subject, and commands lengthy treatment in the fourth division, while in the last one the various processes for the treatment and disposal of the sewage of towns and villages are described and discussed.

In conclusion, we heartily recommend Mr. Bailey Denton's work to all who are interested in public health, remembering that Franklin once said "public health is a nation's wealth."

BOOKS, PAMPHLETS, ETC., RECEIVED.

THE MATERIA MEDICA OF THE HINDUS; compiled from Sanskrit Medical Works. By UDOY CHAND DUTT. With a GLOSSARY OF INDIAN PLANTS. By GEORGE KING, M.B., and the Author. Calcutta: Thacker, Spink and Co. 1877. From the Author.

EPITOME OF SKIN DISEASES, WITH FORMULÆ. For Students and Practitioners. By TILBURY FOX, M.D., F.R.C.P., etc., and T. C. FOX, B.A., M.B. Second Edition. London: H. Renshaw. 1877. From the Editor.

* 'Report of Rivers Pollution Commissioners,' p. 29.

Correspondence.

M. Wilks.—Cholera Mixture.—The following extract contains probably what you refer to:—

"The remedy is the cholera mixture consisting of equal parts of laudanum, tinct. rhei., and spt. camphor. Begin with 30 drops taken clear and unmixed, with a little sugar in the mouth afterwards; repeat the dose after every evacuation, increasing it if the case becomes urgent to 60 drops (a tablespoonful), or 90 drops if necessary. If the diarrhœa is not controlled by this means an injection of from 30 to 90 drops of laudanum in a tablespoonful of starch will prove a valuable help. This may be often repeated. If the diarrhœa ceases, do not entirely intermit the medicine, but give in gradually diminished doses every one or two hours for a period of twelve or even twenty-four hours.

"(2) For the vomiting stage the best remedy is—

℞ Laudanum.
Tinct. Capsicum.
Tinct. Ginger.
Tinct. Cardamoms.

Of each equal parts. To be given 40 to 60 drops undiluted, and followed by sugar, after every fit of vomiting, taking care to give it as soon as the fit ceases; when a useful adjunct to the medicine will be a mustard poultice to the abdomen.

"(3) For the stage of malignancy, the only remedy is stimulants, especially brandy, which must be given with great freedom, from two to four teaspoonfuls every half or even quarter of an hour till heat returns, and pulse and sensibility are restored. It is always to be given undiluted. Alcohol would answer if brandy is not to be had. Continue with this artificial heat. Bottles of hot water, fricture of the limbs (which no one need fear apply), and mustard, perhaps, to the feet and hands, stomach and limbs. Be bold rather than cautious."

"Natura."—(1) *Vicia Cracca*; (2) *Plantago lanceolata*; (3) *Rumex crispus*; (4) *Stachys sylvatica*; (5) *Matricaria inodora*; (6) *Sonchus oleraceus*; (7) *Lapsana communis*.

"Herba."—It is against the rules to name specimens for persons contending for the Botanical Prize.

"Eriophorum," in sending plants to be named, must comply with the rule as to all correspondents communicating their names and addresses.

T. D.—(1) *Scrophularia nodosa*; (2) *Agrimonia odorata*; (3) *Galium Mollugo*; (4) *Galium palustre*.

T. A. R.—(1) Hair Oil Scent: Ol. Lavand., and Ol. Rosmarini, of each 8 parts; Ol. Cassiæ, 1 part; Ol. Caryophylli, 2 parts. (2) Apply to the Secretary for a copy of pamphlet entitled, "Hints to Apprentices and Students."

A. Mitchell.—(1) *Trifolium arvense*; (2) *Euphrasia officinale*.

"Finance."—(1 and 4) *Lastrea Filix-mas*; (2) Send a perfect frond with sori; (3) Send a specimen with sori; (5) *Cystopteris fragilis*; (6 to 9) *Athyrium Filix-fœminea*.

G. Sampson.—(1) Genus *Œnanthe*; send specimens with root and fruit for the determination of species. (2) *Obione portulacoides*.

J. T. Thomas.—The formula for Acetum Ipecacuanhæ approved by Dr. Duckworth (See *Pharm. Journ.* [3], vol. ii., p. 723) is as follows:—

"Ipecacuanha Root (bruised) . 1 oz.
Acetic Acid . . . . 1 oz.
Distilled Water, a sufficiency.

Macerate the ipecacuanha and acid for twenty-four hours, pack in a percolator, and pour distilled water gradually over it until one pint of percolate has been obtained."

"Julus."—You are recommended to consult a solicitor.

"Tinctura."—We do not think any agency exists for the sale of such things.

E. B. J.—The plant is an exotic.

"Pharmacist."—See Mr. Vernon Harcourt's Cantor Lectures on the Chemistry of Gas Manufacture, now publishing in the *Journal of the Society of Arts*.

M. Heanley, R. H. T., and *"Colorado."*—The so-called "Paris Green" is an aceto-arsenite of copper.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Fisher, An Apprentice, Associate, M., R. H. T., S.A.R., H. S. F., C., E. M.

NOTES ON INDIAN DRUGS.

BY W. DYMOCK.

(*Continued from page* 25.)

OCIMUM PILOSUM.—*Local name*, TUKM I RIHAN.

Small, black, oblong, seeds barely, $\frac{1}{16}$ of an inch long, slightly arched on one side and flattened on the other, blunt-pointed. At the base there is a small projection with a white point, where the seed was attached to the ovary. They have no odour. The taste is oily and slightly pungent. When placed in water or in the mouth they immediately become thickly coated with semiopaque mucilage. The plant was obtained by sowing some fresh bazaar seed imported from Persia. It does not grow in this part of India, but is worthy of introduction, as it has a peculiarly delicate verbena odour. Roxburgh describes it as a native of India, and gives the Bengalee name as "Babooi toolsi:" he also notices its use as a medicine. Large quantities of the seed are imported from the Persian Gulf. The Bombay druggists corrupt the name into Takmeria. Medicinally, it is mucilaginous and slightly stimulant.

DALBERGIA SYMPATHETICA.—*Local names*, PETGULI' *and* TITABLI.

The leaves of this plant are used at Goa as an alterative. It is a very remarkable scandent shrub; the stem studded thickly with large blunt thorns, often nine inches long, some of them contorted so as to assist in supporting it upon high trees; the leaves are pinnate and furnished with numerous small delicate oblong, very obtuse, leaflets; the flowers are in short axillary cymes; the legumes generally one seeded, about two inches long. Titabli is the native name at Goa and in the South Concon. In Bombay the plant is not, as far as I know, used medicinally. Cattle eat the leaves.

PLANTAGO PSYLLIUM.—*Local name*, BARTUNG.

Minute, oblong, brown seeds, marked with waved, slightly elevated, longitudinal ridges of a darker colour; one side of the seed arched, the other concave, and marked with a scar showing the attachment to the ovary. They are insipid, and have an oily smell when crushed. Soaked in water they become coated with a transparent mucilage. Bartung, usually pronounced Barhang, is a remedy of great repute in Persia for dysentery. A large quantity is imported into India, through Bombay. We have the evidence of Valentine Baker as to its efficiency when he suffered from the above-mentioned disorder during his travels in Khorasan. When dysentery is supposed by the Hakeems to be due to a heated condition of the humours, Ispaghool (*Plantago Ispaghula*) is preferred. When a cold condition is diagnosed, Bartung is given. The Arabs call it *Lisan ul Hamal* (kid's or fawn's tongue), from a supposed resemblance of the leaves to the tongue of those animals.

PHYLLANTHUS MADRASPATENSIS.—*Local name*, KANOCHA.

Small, polished, heart-shaped seeds of a grey colour, prettily marked with delicate dark brown lines like basket work; length $\frac{1}{10}$ th of an inch; breadth somewhat less. One side of the seed is arched; the other presents two sloping surfaces uniting to form a longitudinal ridge. At the pointed end is a small scar marking its attachment to the ovary. The testa is hard and brittle. When soaked in water it immediately becomes thickly coated with a semiopaque mucilage. The kernel is oily and has a sweet nutty taste. For a description of the plant *vide* Roxburgh's 'Flora Indica,' iii. 654.

HIBISCUS SP.?—*Local name*, ALTI, *or* ULTEE.

The drug consists of several roots branching from a knotted woody stock, the largest being about as thick as the little finger. They are straight, unbranched, and have a thin brown cortex covering a thick white farinaceous parenchyma, in which are seen well-marked yellowish medullary rays spreading from a tough, woody, central column, the diameter of which is less than the semidiameter of the farinaceous portion. Examined under the microscope most of the cells of the farinaceous portion are seen to be filled with starch granules; but some large ones contain mucilage only. The central woody column abounds in large pitted vessels. When soaked in water the root gives out abundance of mucilage having a faintly bitter taste. Alti is used by the Portuguese at Goa as a substitute for Althæa, of which the native name appears to be a corruption. It is a stunted, woody shrub, with cordate, serrated, leaves. I have not seen the flowers or fruit. The roots, when properly scraped and dried, are very white, and apparently an efficient substitute for the imported article.

BIGNONIA XYLOCARPA.—*Local name*, KURSING.

By a rough process of the same nature as that by which tar is obtained from pine wood, a thick fluid of the colour and consistence of Stockholm tar is obtained from the wood of this tree. So much does this substance resemble tar in odour as well as appearance that it may easily be mistaken for it. The wood of *B. xylocarpa* is hard, but easily split. When sawn across it presents a yellow resinous surface. Sections examined microscopially show that the yellow colour is due to a solid resinous deposit in the pitted vascular system.

Heterophragma Roxburghii, Warus, another of the Bignoniaceæ, yields a similar product. It is a large and very common timber tree. These tars have both an established reputation among the natives as remedies in certain cutaneous eruptions of a scaly nature. As oil of cade has lately been recommended in similar diseases, it might be worth while to give them a trial.

PARAMIGNYA MONOPHYLLA.—*Local name*, KARWA WAGUTTY.

This scandent, prickly shrub bears a pulpy four-celled fruit, the size of a small apple. The root is medicinal; it is long and woody. The pieces selected for use are about as thick as the finger, and covered with a somewhat scabrous brown bark, which has a bitter saltish taste. If allowed to remain for some time in the mouth, the salt taste becomes much more decided. Sections of the bark placed under the microscope show from ten to twelve rings, composed of bundles of liber cells closely set and encased in an armour of crystalline cubes, which, from the taste of the bark, are doubtless chloride of sodium. A somewhat similar arrangement of cubes may be seen in several other barks, but in none of those which I have examined is it nearly so marked as in this. *Karwa Wagutty* is considered to have alterative properties. It must not be confounded with Wagutty (*Capparis brevispina*).

CENTAUREA BEHEN.—*Local name*, SUFFED BEHMAN

The dry root is of a whitish brown colour, much shrivelled and twisted; near the crown it is marked by numerous circular lines. It may be either a simple tapering root or more or less branched; sometimes a portion of purplish stem remains attached; the average length is about 2½ inches, diameter ¾ of an inch; the interior is white and spongy; when soaked in water it swells and becomes mucilaginous. The taste is mucilaginous and slightly bitter. Microscopic examination shows that behen contains no starch. The parenchyma appears to consist almost entirely of mucilage cells. There are numerous large bundles of spiral vessels. This drug has been confounded with Ashva-gandha, the root of *Physalis somnifera*, by Ainslie. It is imported into Bombay from the Persian Gulf in considerable quantities, and is always to be found in the shops. The Hakeems prescribe it largely; they consider that it purifies the blood, fattens the body, and greatly increases the virile powers.

SPHÆRANTHUS MOLLIS.—*Local name*, MOONDI.

A very common annual plant, generally about eight inches high; stems winged; leaves thick, sessile, decurrent, obovate; bristle serrate, covered with down consisting of long white hairs; flower heads solitary, mostly terminal, subglobular, the size of a horse bean, purplish when fresh, but lose their colour when dried; roots fibrous. The drug generally consists of the whole plant, but the capitula are sometimes sold separately. The taste is a little bitter; the odour of the capitula terebinthinate. Moondi appears to be well known all over India as an alterative and purifier of the blood; the peculiar odour may be observed in the urine and perspiration of those who take it. It is considered to be hot, and moist in the second degree. Its uses in native medicine are fully described in the 'Makhzan ul Adwiya.' The flower heads of this plant will probably be found to yield an essential oil likely to contain its active principles.

PHYSALIS SOMNIFERA.—*Local name*, ASHVA-GANDHA.

The plant consists of a stout, long, tapering, woody root, an inch or more in diameter, surmounted by a knotted crown, from which spring several shrubby flexuose branches, which are generally round, and from one to two feet long. The leaves are double, ovate, variable in size, but not more than three inches long; flowers axillary, subsessile, crowded at the ends of the branches; corolla campanulate, yellowish green, very small; berry red, smooth, size of a pea, covered by a membranaceous closely fitting calyx, open at the apex; seeds numerous, yellowish white, reniform, laterally compressed, about one sixteenth of an inch long; testa honeycombed. The whole plant is covered with small branched and pointed white hairs, which give it a hoary appearance. The odour is pungent and disagreeable, like the urine of horses; this is expressed in the native name, Ashvagandha. The root consists of a twisted, white, woody column, which is covered by a thickish soft bark, containing a good deal of red colouring matter, visible through the greyish epidermis. The microscopic characters are not in any way remarkable. The fresh root bark has the same odour as the plant; the leaves and fruit are a little bitter and nauseous. This drug must not be confounded with the Asgund of the Bazaars, described in the next article. We have no reliable information regarding the physiological action of *P. somnifera*.

Botanical source uncertain.—*Local name*, ASGUND.

The dry root is from six to eight inches in length, often less, and from one quarter to half an inch in diameter at the thickest portion, a little below the crown; it is plump, smooth, tapering, and of a light yellowish brown colour externally, white internally, brittle, fracture short and starchy. The root is seldom branched. Attached to the crown are the remains of several slender stems. Microscopic examination shows the substance of the root to be principally composed of starch, inclosed in delicate oval cells; the cortical portion is about one twentieth of an inch in thickness. The vascular system consists of a large central bundle of scalariform and dotted vessels; round this several smaller bundles and single vessels are arranged in a radiating manner. Asgund has a mucilaginous and slightly bitter taste. In the 'Makhzan ul Adwiya' it is described as a tonic and alterative, and is said to have much the same properties as *Centaurea Behen*. There is no mention of its being a narcotic. It is uncertain where the drug comes from. The 'Makhzan' describes it as an Indian root.

TIARIDIUM INDICUM.—*Local name*, BOOROONDI.

An annual plant, one to two feet high, common in ditches in Bombay: it seems to like a rich soil. The whole plant is more or less covered with simple hairs; stems several, as thick as the little finger, hollow, branched from the axils of the leaves; leaves generally alternate, cordate-ovate, rugose, long-petioled; petioles margined; spikes terminal, solitary, simple; flowers like those of heliotrope, but smaller; fruit mitre-shaped. The plant has a fetid odour like stramonium; taste a little bitter. It is used as a local application to boils, sores, and the stings of insects.

FERULA ALLIACEA.—*Local name*, HING.

In a former number of the *Pharmaceutical Journal* I briefly noticed the botanical source of this drug, interesting on account of the enormous quantities of it which are used as a condiment by almost every class of vegetarians in India, and for its medicinal properties, which are much more powerful than those of the officinal asafœtida. Early in 1874, the late Mr. Hanbury was kind enough to forward to me the proof sheets of the article upon Asafœtida in the 'Pharmacographia,' with a request that I would obtain further information upon the subject. Unfortunately this could not be done in time for publication in that work, as it involved sending to Persia for specimens of the plant and drug. In August, 1874, through the kindness of Mr. Ardeshir Mehrban, a Parsee merchant, of Yezd, I obtained the first box of specimens collected in the neighbourhood of that city. It contained: 1st. The fresh root, with gum resin adhering to the broken portions, and from which, upon section, a further exudation took place, at first opaque and milky, but drying in the course of a day or two into a light-brown translucent substance. 2nd. The flower stem with flowers and very immature fruit. 3rd. The leaves. The plant arrived in a broken state, and was forwarded to Mr. Hanbury. Upon its receipt, he wrote: "This morning I have devoted to the asafœtida plant, and to a comparison of it with the figures and descriptions published by Borszczow, Balfour, and Hooker; but to decide on its botanical name is at present a difficult, if not impossible task. I suppose it to be either the *Narthex* of the Edinburgh garden, or the *Scorodosma* of Borszczow, admitting for the moment that these are two good species; but the specimen does not furnish all the characters requisite for a strict comparison. I cannot tell whether the plant has the great sheathing petioles that form so striking a feature of the *Narthex*, nor is it possible to say whether the flower stem bore umbels arranged in a tall regular obelisk as *Narthex*, or crowded towards the summit as in *Scorodosma*. The foliage might do for either plant, though in having shorter segments it better agrees with the latter. The inflorescence which I have soaked and dissected consists of fertile female, and abortive flowers, none stameniferous. They are remarkably glabrous, not pubescent, as in Borszczow's plant; but this is of small moment."

Early in 1875 I was able to send another box of specimens, with ripe fruit and a large supply of leaves. In acknowledging it, Mr. Hanbury wrote: "The box containing the asafœtida plant arrived on the 29th January, in excellent order, and its contents have given me great pleasure. The large plant, though it had been rudely broken up and stuffed into a narrow space, proved to be fairly perfect; and by soaking in cold water I was able to restore it to shape, and then to fix it together so as to make a really beautiful specimen, measuring three feet six inches in height. The leaves, also by soaking them and taking some pains, form very decent herbarium specimens, and there are enough of them to supply several collections. But the chief point with me has been to determine the plant. From the foliage, the pink colour of the stem, and the size of the fruit, I judged it might be the *Ferula alliacea* of Boissier; but there being no specimen of this at Kew, I had to transmit a portion of yours to M. Boissier, in Switzerland. His reply was definite. The plant from Yezd agrees in foliage exactly with *F. alliacea*, in stature, size of fruit, and other respects; but the fruit has a broader margin than in M. Boissier's specimen. However, M. Boissier thinks it may be set down as that species, a conclusion in which I entirely agree. *Ferula alliacea* was previously known to me only by description. You will observe that we have named it in the 'Pharmacographia' as a possible source of asafœtida. I have thought it right to make a wide distribution of the fine supply of seeds with which you have favoured me, and I have therefore sent packets to the Botanical Gardens of Kew, Edinburgh, Oxford, Paris, St. Petersburg, Bern, Strassburg, Florence, Pisa, Naples, Palermo, Athens, and to botanical friends on the Mediterranean coast, in South Africa, and a few other places. As the seeds seemed fresh and good, I am in hopes that many plants may be raised."

Soon afterwards I received a sample of the unsophisticated drug, which is obtained by taking thin slices from the crown of the root, together with the gum resin which has collected upon them, until the root is exhausted. In this sample the slices are extremely thin and form only a small portion of the mass. The gum resin is brown and translucent; the odour purely alliaceous. To make the commercial article the exhausted root is collected, cut up, and mixed with the asafœtida, which has been obtained in the manner described above. To do this water is required, which impairs the translucency. Hing comes to Bombay in skins, each package weighing 100 lbs. or more; latterly some boxes have been received. The quality varies greatly, the adulteration consisting in an undue proportion of root. In Bombay it is often still further adulterated by mixing it with gum arabic in different proportions, according to the priced article required. To do this, the package is broken up and moistened, the gum is then added, and the whole trodden together by men with naked feet upon a mat. When sufficiently mixed up, is sewn up in skins to imitate the original packages. Hing must not be confounded with Hingra, the officinal Asafœtida.

NARTHEX ASAFŒTIDA.—*Local name of gum resin*, KANDAHAREE HING.

This substance appears to be quite unknown in Europe; neither Professor Flückiger nor the late Mr. Hanbury had ever seen it until I sent them samples. I have not as yet been able to obtain authentic specimens of the plant from Kandahar, but for the following reasons I consider it likely that it will prove to be the same as that which produces the officinal drug:—

1. Bellew mentions a very high priced asafœtida obtained by wounding the leaf bud of the plant which produces ordinary asafœtida; our article is generally mixed with numerous leaf buds, which have evidently been cut off by a sharp knife; its price is also much higher than that of any other kind.

2. When examining a number of bales of common asafœtida from Kandahar I found some of them to contain particles of the more expensive drug, and a large quantity of what appeared to be gum resin in a transition stage between the transparency of Kandahar Hing and the opacity of the commercial article.

3. A portion of root found in a bale of Kandahar Hing agreed exactly with a piece obtained from a bale of common asafœtida.

Kandaharee Hing comes to Bombay in small quantities; it is sewn up in goat skins, forming small oblong bales, with the hair outside. When it first arrives it is in moist flaky pieces and tears, from which a quantity of reddish-yellow oil separates on pressure; the gum resin also is of a dull reddish-yellow colour, soft, and somewhat elastic, with an odour recalling that of garlic and oil of carraways. By keeping, it gradually hardens and becomes brittle and of a rich red-brown colour; the odour also becomes more purely alliaceous, and approaches to that of the commercial kind. In one instance I have known the drug to arrive in Bombay in a semi-fluid state; this also happens sometimes in the case of common asafœtida, and is probably due to an exceptionally moist season, which makes the juices of the plant unusually liquid. This kind of Hing is, I am informed, used by wealthy people in Central India as a condiment and medicine; it is not generally known in Bombay, and is only to be found in the warehouses of a few wholesale dealers.

NARTHEX ASAFŒTIDA.—*Local name of gum resin,* HINGRA.

This is the asafœtida of European commerce; it arrives in Bombay from Persia and from Affghanistan. The former is produced in the province of Laristan, and is known to Persian merchants as Anghuzeh i Lari; it generally arrives in a moist condition, but soon hardens. The latter comes by the Indus route, and is generally hard and dry. Very fine samples are not uncommon. The stony asafœtida described by Pereira is commonly met with in this market; it is simply a mixture of very fluid common asafœtida with the white sandy soil of the country in which the plant grows; it fetches a very low price, and, as far as I can make out, the mixture is made more for convenience of carriage than for the purpose of deception. Besides, when the juice is unusually fluid it runs out upon the surrounding ground and becomes mixed with the sand. Common asafœtida is only used in India by the poorest classes. The product of *Ferula alliacea* is a much more powerful drug, and is always issued instead of it from the Government stores in Bombay.

BALSAMODENDRON OPOBALSAMUM.—*Local name of fruit,* HAB UL BALESAN.

These berries are imported from Arabia, and are kept by all the native druggists; they have a pleasant terebinthinate odour. I have compared them with the figures and description of the fruit of *B. opobalsamum* in Bentley and Trimen's 'Medicinal Plants,' and consider that there can be no doubt of their identity. If soaked in water they soften and can be easily dissected and the remarkable form of the pulpy layer within the epicarp be seen. Sections of the epicarp show very large ramifying balsam cells, which appear to communicate one with another. The fruit is considered to be a powerful carminative and digestive; it is also praised as a stimulant expectorant, and is usually administered in combination with tragacanth.

PEGANUM HARMALA.—HURMARO AND HURMAL.

The drug, as found in the bazaar, consists of the seeds mixed with a few pedicels surmounted by the five-partite calyx and portions of the three-celled, three-furrowed capsule. The seeds are of a dull greyish-brown colour, irregularly angular, and about one-eighth of an inch long; they have a heavy narcotic odour when crushed, and a bitter taste. Examined under the microscope, the testa, which is rough and squamous, may be seen to consist of two rows of large honeycombed cells, the walls of which contain brown colouring matter. The kernel is greenish, and when a section is placed in glycerine for examination it immediately develops a fine green fluorescence; it consists of two longish cotyledons surrounded by albumen; the cell contents of both appear granular. Some seed crushed and treated with water for a few minutes produced after filtering a pale yellow fluid with a marked green fluorescence; this was destroyed by alkalies and restored by acids.

A further examination of the seeds was made by exhausting them with rectified benzene, spt. rectificatus, and water acidulated with hydrochloric acid. The benzene solution was of a pale yellow colour, and upon evaporation yielded a rich reddish-brown oil having no very marked odour and a nauseous taste.

The tincture made with rectified spirit was of a deep red, like Tinct. lavandulæ comp., very opaque and highly fluorescent. Upon evaporation it yielded a soft extract of the colour of dragon's blood, and the odour of *Cannabis indica.* This, when exhausted, with water, gave a pale red solution with a green fluorescence, which, when treated with a solution of oxalate of ammonia, threw down the red colouring matter and became pale yellow, but retained its fluorescence. The remainder of the spirituous extract after complete exhaustion with water consisted of a soft resin of a deep carmine lake colour, having a heavy narcotic odour like resin of *Cannabis indica.*

The portion treated with acidulated water yielded a pale sherry-coloured fluorescent solution, which upon evaporation gave a soft yellow extract, with an odour like honey; the greater part of this dissolved in rectified spirit, forming a yellow fluorescent solution; this, after filtration, was evaporated to a thin syrup, and upon cooling formed a dark brown crystalline mass, which was not further examined, as the alkaloids contained in the seeds have already been fully investigated. *Vide* Watts' 'Dictionary,' article "Harmaline."

In native works on materia medica Hurmal is described as an alterative and purifying medicine in atrabilis, and also in diseases supposed to arise from cold humours, such as palsy, lumbago, etc.; it is also said to stimulate the sexual system both in the male and female, increasing the flow of milk and menses in the latter. For administration a concentrated decoction is mixed with sweet oil and honey, or the crushed seeds are boiled in wine down to one fourth of the original bulk of the latter, and the mixture strained. *Vide* 'Makhzan ul Adwiya,' article "Hurmal."

Dr. Pandurang Gopal, a medical graduate of the Bombay University, has experimented with this drug. He informs me that the infusion or tincture acts as a stimulant emmenagogue and produces slight intoxication like *Cannabis indica.* He gave the tincture in ½ drachm doses to a female suffering from amenorrhœa, and it had the effect of producing a free menstrual discharge; in five cases of dysmenorhœa he has found it effective in restoring a free discharge; he further says that it is sometimes used by the native midwives to procure abortion. Dr. Pandurang believes that it has properties in common with ergot, savin and rue. The equal activity of watery and spirituous preparations may be explained by the fact that the red resinous colouring matter is a secondary product formed by the oxidation of the alkaloid harmaline; it is only produced after a prolonged digestion of the seeds in spirit.

Hurmal seed is imported from Persia, but the plant has been introduced into India by the Mahometans, and in this presidency is to be found in abundance among the ruins of Beejapur. The Persian name is Sipand. When sprinkled upon burning coals it is supposed to avert the malignant influence of the evil eye. Its medical properties are worthy of further investigation.

(To be continued.)

THE ACTION OF CERTAIN MANIPULATIONS AND REAGENTS ON CALOMEL.*

BY FRED. M. CORWIN, PH.G.

Mercury forms two classes of salts, one containing proportionately twice as much acid radical as the other, and each convertible into the other by certain agents.

The mercurous chloride, or calomel, is mild in its action on the human system, being a safe and much-used remedy.

The mercuric chloride, and mercuric salts in general, are powerful and corrosive agents, often producing serious and fatal results.

The object of the following experiments was to ascertain whether *mercuric* salts were produced from *mercurous* (namely *calomel*) by the agents and methods described.

The agents were either physical or chemical.

The physical agents were trituration, boiling with water, and sublimation.

The chemical agents were certain dilute acids and salts of the U. S. P.

The tests used for the detection and identification of mercuric mercury were metallic copper and hydrosulphuric acid in strongly acidified solutions.

In all cases where a deposit was obtained on copper, the copper, after being thoroughly washed and dried, was placed in a clean dry test-tube and heated to redness.

If mercury was present it sublimed and collected in a cooler part of the tube. A crystal of iodine was then placed in contact with it, and heat again applied, when the yellow iodide of mercury turning red by friction sublimed in another part of the tube.

The hydrosulphuric acid was added in small portions at a time, producing at first a light coloured precipitate, turning yellow, orange, brown, and black as the successive portions were added. This reaction is characteristic of a mercuric salt.

Several attempts to obtain absolutely pure calomel proved unsuccessful. That used, being the purest which was examined, was found to contain a small quantity of ferric iron, probably as ferric chloride.

I. PHYSICAL AGENTS.—a. *Trituration.*—About two drachms of calomel were rubbed in a dry porcelain mortar. On moving the pestle through it with pressure, it produced shining *straw-yellow* streaks, and the whole powder gradually assumed a yellowish tint. After rubbing for half an hour it was macerated with water, filtered, and the filtrate acidified with hydrochloric acid.

Copper: no action. Hydrosulphuric acid: no action.

b. *Boiling.*—1. About two drachms were heated in a flask with water, on a water-bath, for fifteen minutes, the mixture filtered, the filtrate evaporated about one-half on a water-bath, and acidified with hydrochloric acid.

Copper: no action. Hydrosulphuric acid: no action.

2. About two drachms were boiled in a flask with water by direct contact with flame, and under constant agitation, for fifteen minutes, filtered, the filtrate evaporated about one-half on water-bath, and acidified with hydrochloric acid.

Copper: *a deposit.* Hydrosulphuric acid: *characteristic precipitate.*

c. *Sublimation.*—1. About twenty grains were heated in a dry test-tube, the heat being only sufficient to slowly sublime it. It was then macerated with a small quantity of water, filtered, and filtrate acidified with hydrochloric acid.

Copper: no action. Hydrosulphuric acid: no action. The sublimate was perfectly white.

2. About twenty grains were heated so as to sublime rapidly, the glass becoming red hot. It was macerated with water, filtered, and the filtrate acidified with hydrochloric acid.

Copper: *a deposit.* Hydrosulphuric acid: *characteristic precipitate.*

The sublimate had a greyish appearance in places, probably due to metallic mercury.

II. CHEMICAL AGENTS.—a. *Acids.*—The acids used were the dilute acids of the Pharmacopœia. About a drachm of calomel was placed into a five-inch test-tube, the tube was nearly filled with an acid, and allowed to macerate for three days, being agitated occasionally. It was then filtered and the filtrate evaporated about one-half on a water-bath.

With some acids a change was noted in the appearance of the calomel: with others it remained unaltered. The following table exhibits the results:—

Acids.	Copper.	Hydrosulph. Acid.	Appearance.
Hydrochloric . .	Deposit.	Characteristic ppt.	Unchanged.
Nitric	Not used.	,, ,,	,,
Sulphuric . . .	No action.	No action.	,,
Hydrocyanic . .	Deposit.	Characteristic ppt.	Turns dark.*
Nitro-hydrochloric	Not used.	,, ,,	Unchanged.
Phosphoric . . .	No action.	No action.	,,

b. *Salts.*—Of the salts used, sixteen were in solution with water. The solutions were made by dissolving one part of the salt in ten parts of water, with one exception, namely, the potassic chlorate solution, which was made by dissolving one part of the salt in twenty parts of water.

About half a drachm of calomel was placed into a five-inch test-tube, the tube nearly filled with a solution and allowed to macerate three days with occasional agitation. It was then filtered, and the filtrate acidified with hydrochloric, nitric, or sulphuric acid, according to the character of the salt.

With some of the solutions a change was noted in the appearance of the calomel, either immediately or on standing.

Solution of	Copper.	Hydrosulph. Acid.	Appearance.
Potass. Bromide .	Deposit.	Characteristic ppt.	Lead colour.
,, Chlorate .	No action.	No action.	Unchanged.
,, Cyanide .	Deposit.	Characteristic ppt.	Dark, nearly black.
,, Hypophosphite . .	No action.	No action.	Unchanged.
,, Nitrate . .	,,	,,	,,
,, Sulphate .	,,	,,	,,
,, Sulphite .	,,	No ppt. Separation of S.	Green, grey.
Pot. & Sod. Tartrate	Deposit.	Characteristic ppt.	Unchanged.
Ammon. Bromide .	,,	,, ,,	Slate colour.
,, Chloride .	,,	,, ,,	Unchanged.
,, Iodide .	,,	Orange red ppt., which gradually turns dark, same as $HgCl_2$ in NH_4I.	Turns yellow then dark with green tint. Solution is yellow.
,, Nitrate .	,,	Characteristic ppt.	Dark at point of contact. Grey on agitating.
,, Sulphate	,,	,, ,,	Unchanged.
Sodic Chloride . .	,,	,, ,,	,,
Ferric ,, . .	No action.	No action.	,,
,, Pyrophosphate . .	,,	,, ,,	,,

* From a thesis presented to the College of Pharmacy of the City of New York. *New Remedies*, July, 1877.

* On the reaction between calomel and hydrocyanic acid, see a paper by T. H. Powell and J. Bayne in *Pharm. Journ.*, April 8, 1876.

Of the two following salts, about a drachm of each was rubbed, with an equal bulk of calomel, in a porcelain mortar for fifteen minutes. They were then macerated with a small quantity of water, filtered, and the filtrates acidified.

Filtrate from	Copper.	Hydrosulphuric Acid.
Bismuth Subnitrate.	No action	Peculiar ppt. Not characteristic of mercury.
Ferric Ferrocyanide.	,,	No action.

SCLEROTIC ACID, THE ACTIVE PRINCIPLE OF ERGOT.

This Journal last year* contained a condensed summary communicated by Professor Dragendorff, of Dorpat, of his important researches in conjunction with Mr. Podwissotzky, on the constituents of ergot, in which they announced the discovery of a proximate principle of an acid character and exerting in a high degree the specific effects of the drug. Since then the authors have published their results in detail.† In the following translated abstract which we borrow from *New Remedies*, is described their method of preparing this principle, to which they gave the name "sclerotic acid."

Referring to the accounts previously given, and leaving aside the recital of various abortive attempts, on the part of the authors, to obtain the substance in a perfectly pure state, we shall at once give the process finally adopted, which yields a nearly pure product.

Very finely powdered ergot is exhausted with distilled water, the solution concentrated *in vacuo*, and the residuary liquid mixed with an equal volume of 95 per cent, alcohol. This causes the precipitation of a peculiar slimy substance, scleromucin, together with a portion of the salts and the greater part of the suspended fatty matter. The mixture having been allowed to stand on ice for twenty-four or forty-eight hours, it is filtered and the filtrate mixed with a further quantity of 95 per cent. alcohol, sufficient to precipitate all the sclerotic acid in combination with the bases (chiefly as calcium sclerotate). The separation of the precipitate is promoted as before by placing the mixture on ice for some days. This causes the deposited mass, which has a brownish colour, to adhere firmly to the walls of the vessel, so as to permit the supernatant liquid to be easily poured off. The precipitate is kneaded with alcohol of 80 per cent., and immediately thereafter dissolved in a sufficient quantity of 40 per cent. alcohol, when the remainder of the scleromucin and another larger portion of the foreign salts are left behind. The filtered liquid is now mixed with absolute alcohol, whereby sclerotic acid is precipitated in conjunction with certain bases and other substances. The impure product, when carefully dried over sulphuric acid, was found on analysis to contain 8·5 per cent. of potassium, about 0·36 per cent. calcium, 4·3 per cent. sodium, 2·74 per cent. phosphoric and 3·4 per cent. silicic acid, or altogether, 12·9 per cent. of ash.

The greater part of these admixtures may be removed and the sclerotic acid obtained free, by adding, before the final precipitation with absolute alcohol, a considerable quantity of hydrochloric acid (for every 100 c.c. of solution, 5–6 gm. of the acid, spec. gr. 1·100), allowing to stand at ordinary temperature for a few hours, and then proceeding to precipitate. In this manner the amount of ash may be brought down to 3 per cent., and by repeated solution, addition of acid, and precipitation, it may further be reduced to less than 2 per cent. or 3 per cent. A more complete purification is difficult and hazardous, because every addition of hydrochloric acid causes the decomposition of a small quantity of the sclerotic acid, while at the same time a portion of the latter is lost by remaining in solution.

The resulting product, although not chemically pure, is nevertheless, so to say, physiologically pure, as it always produces constant and identical results, no matter from what sample of (good) ergot it was obtained.

Sclerotic acid is entirely odourless and tasteless. In aqueous solution it has a faint acid reaction, and decomposes calcium carbonate slowly, even on warming. Boiling nitric acid of 1·200 spec. gr. produces a little picric and oxalic acid, and a new substance, which assumes a bright yellow colour on adding ammonia or other alkalies. More concentrated nitric acid converts it into picric, oxalic, mucic, tartaric, and aposorbic acids. It is not a glucoside; nor does it lose its effectiveness on the addition of dilute sulphuric or hydrochloric acids; on the contrary, the latter appears to intensify its effects. Boiling alcohol, in presence of sulphuric acid, extracts it from ergot in small quantities, cold alcohol not at all. It is therefore possible to abstract by means of cold alcohol and sulphuric acid a portion of the colouring matter from ergot, before extracting the sclerotic acid with water. But, unfortunately, the aqueous solutions (which carry with them a portion of the alcohol and sulphuric acid) spurt or bump so energetically during the distillation, that this modification of the process becomes unadvisable.

It might be supposed that sclerotic acid is not an acid, but an alkaloid, as it yields with phosphomolybdic acid a yellow, and with tannin an almost colourless precipitate. But other alkaloidal precipitants are without action upon it, and only lead acetate with ammonia produces a strong flocculent precipitate.

When properly purified, sclerotic acid is hygroscopic but not deliquescent, which circumstance distinguishes it advantageously from the commercial purified extracts of ergot. It is found in these in greater or lesser quantity according as a weaker or a stronger alcohol was employed in exhausting the ergot. A few commercial extracts were found to be very deficient. In Bonjean's and Wernich's preparations and in Wiggers' Osmazom it exists in considerable quantity, while scleromucin is almost entirely absent, as is the case in all alcoholic extracts of ergot. In Zweiffel's preparation the acid occurs in a tolerably pure state, in a less pure condition in Buchheim's. In alcoholic tinctures of ergot, and in Wiggers' ergotin it is only present in traces or is entirely absent.

Good ergot contains about 4 to 4·5 per cent of the acid, although samples are met with which contain scarcely 1·5 to 2 per cent.*

* *Pharm. Journ.*, June 17, 1876.

† *Arch. f. experim. Pathol. und Pharmacol.*, condensed in *Pharm. Zeit. f. Russl.*, 1877, No. 5. etc.

* Sclerotic acid (acidum scleroticum or sclerotinicum) is quoted in the United States prices-current at 20 dols. per ounce. It is administered hypodermically in doses of 0·04 0·05 gm. (one-sixteenth to one-twelfth grain).

THE SPONGES OF COMMERCE.†

From a very elaborate and learned paper in a recent number of the Memoirs of the Boston Society of Natural History on the North American Poriferæ, with remarks upon foreign species, we extract the following new and valuable information on the characteristics and classification of the commercial sponges. The great difficulty which is experienced in any attempt to distinguish species results from the extreme susceptibility of all keratose sponges to any change in external conditions. They appear to require for the production of the forms in abundance, tropical or sub-tropical seas, and attain by far their greatest development in the number of the forms and species in the West Indian Seas. The typical forms, the commercial sponges, are essentially confined to the

† From the *Journal of Applied Science*, August 1, 1877.

waters of the Caribbean Islands, Bahaman Archipelago, and the southern and western coasts of Florida in the western hemisphere, and to the Mediterranean and Red Seas in the other. Australia affords a few forms, and I have heard, though I cannot substantiate the fact, of some species on the Atlantic coast of Brazil. Bermuda also has a few of the commercial kinds, which, according to Mr. Goode's report and his suite of specimens, are much coarser than the Keo West, darker in colour, and, in fact, just about intermediate between these and those of Australia. They are occasionally found in the stores, but as a rule, are used only by the fishermen themselves about their boats, the Bahama sponges being preferred for domestic purposes by the inhabitants. Of course no complete report can be written until Mr. Goode's collection from Bermuda, which is very large, and has been very carefully made, can be examined; but it appears that the finest forms grow only in the protected lagoons at depths varying from five to twenty feet on a sandy bottom. The temperature was not stated. They are cured in a very careless manner by exposure to the weather, a process which doubtless does not increase their value. The true spongiæ are all shallow water forms. In the Mediterranean, according to Eckhel, they are not found below thirty fathoms, and in American seas about the same probably, though not fished to greater depths than five fathoms. The fishery is principally carried on in the West Indies by the aid of a sort of hooked fork, like two shepherds' crooked hooks on a long pole. The fishermen cannot so successfully work at considerable depths with this instrument as by diving, or with the diving apparatus or armour, and various forms of drags, etc., employed in the Mediterranean. The greater part of the fishery is accomplished between the depth of three and twenty feet, according to the report of Dr. Palmer, from which these remarks are principally derived. The finest qualities of American sponges are obtained in the Bahamas, the principal depot being at Nassau.

The process of preparation is not so careful as in Europe, probably owing to the greater coarseness and cheapness of the specimens. The actual fishing is done from boats, generally belonging to some schooner or larger craft. The boats are sent out from the vessel manned by two men. One sculls slowly along, while the other watches the bottom with a water glass. This is a tube about a foot square, closed by a pane of glass at the lower end, which prevents the reflection of light from the surface, and enables a keen observer to detect objects on the bottom at a considerable depth. When sponges are sighted, a signal causes the sculler to stop the boat, the water glass is laid aside, and the sponges are dragged up by means of the hooks. When the fishing is at an end, or the vessel loaded, the cargo is taken to land and "killed," as it is called, by exposure for a few days to the air. After this, the now highly offensive mass is moved into the "crawls." These are pens made by driving stakes into the sand where the water is from six to ten feet deep. They are thrown into these cribs and left to be washed clean by the action of the surf. This takes about one week, at the end of which time the skeletons are examined, and if found to be entirely cleansed of animal matter, dried, sorted according to quality, and strung on cords a fathom in length. They are generally sold by the cargo. The bases are clipped off, and the sponge trimmed with shears and packed in pressed bales for transportation to New York or England, where they are largely used for the manufacture of pilot cloth, hats, etc. The coarser kinds and clippings are also used quite extensively for stuffing mattresses, carriage cushions, etc., in place of hair. They are not of sufficiently good quality to compete with Mediterranean sponges, and are therefore rarely employed for domestic purposes, except in Great Britain(?) and the countries of North and South America. The fisheries near shore are abandoned in the winter on account of the turbid state of the water, which becomes "milky" with suspended coral sand during the more tempestuous months. A more limited fishery, however, is still carried on at Anchor Keys, some thirty-five miles outside of Cedar Keys, and in other places where the water is stiller, clearer, and warmer than nearer shore.

The commercial grades coincide very closely in America and in Europe, but it is quite easy to show that each of them may be considered a distinct species if one has an inclination to multiply in this direction. The grades are Glove Sponge (*Spongia officinalis*), sub-species *tubulifera;* Wool Sponge (*Spongia equina*), sub-species *gossypina*, and Yellow and Hard Head (both under the name of *Spongia agaricina*), sub-species *corlosia*. These correspond with remarkable accuracy to the three principal grades of commercial sponges in Europe. These are the Bath Sponge (*Spongia officinalis*), the Horse Sponge (*Spongia equina*), and the Zimocca Sponge (*Spongia agaricina*). This result, in which three species appear on both sides of the Atlantic as representing alone the marketable qualities of the genus Spongia, becomes of double interest when these varieties, or local species as they might be called, are compared one with another. It is then found that the aspect of the surface is closely similar in each of the three; that sub-species *tubulifera* represents *Spongia officinalis*, sub-species *gossypina* offsets *Spongia equina* in the same way, and lastly, sub-species *corlosia* has the same relation to *Spongia agaricina*. In order to make it still more convincing that such a relationship is not the result of an artificial arrangement, it becomes necessary to describe some of the facts more at length. First, their similarities of surface and aspect are precisely the same as those which experience has led me to adopt in the designation of species in this group. Thus, if they had occurred in different parts of the same sea, I should not have hesitated to unite them. Secondly, their differences can be accounted for by the difference in habitat, and are of varietal and not of specific value, according to the accepted use of the term species. For establishing the first proposition, it is only necessary, as previously remarked, to consult the descriptions of the genus Spongia and the figures. The second proposition, however, requires more attention.

The whole group of Keratosa is confined to seas in which the differences observable between the winter and summer isotherms are not excessive. None are found north of Cape Hatteras and the Islands of Bermuda, and doubtless a similar limit occurs to the southward of the equator: at least it is a noticeable fact that the only specimens in the Museum of Comparative Zoology are from the Island of Fenndo Noronha. On the Pacific shore, Southern California and Chili are the extreme points so far known. On the opposite coast of the Atlantic they are recorded from England to the Cape of Good Hope, and also at the Island of Teneriffe. In the Indian Ocean they are found all along the east coast of Africa, at the Mauritius, and on the shores of India. They have been described from the southern part of the sea of Ochotsk, on the Asiatic continent, and specimens are not uncommon on the coast of Australia and New Zealand. In the Pacific they have been found at the Kingmills Island and Hawaiian Islands. The extreme outlying form to the north, on both sides of the Atlantic, is the excessively coarse *Dysidea fragilis*, with its fibres loaded with debris. Those from the Cape of Good Hope and Southern Australia also belong to the coarser genera. The species cited by Miklucho Maclay from the sea of Ochotsk seems to be one of the Phyllospongidæ, but there is no analysis of the characteristics of the skeleton, only the external form being described and figured in his article on the sponges of the North Pacific (Mémoires de l'Acad. Imp. de St. Petersburg, Vol. 75, No. 3). It would seem, therefore, that the finer skeletons of the Keratosa, those of the genus Spongia, were only to be sought in the intermediate zone, where the waters are of equable and high temperature. Again, in examining the species of this genus with relation to each other, it becomes equally evident that they are finest and most numerous in archipelagoes, or off coasts which are bordered by large numbers of islands, or long reefs, or in sheltered seas.

I am informed by Mr. Gurdon Saltonstall that the sponges near Nassau lie on reefs very much exposed to the action of the waves, often thirty miles from land, and always in currents, sometimes running three or four knots an hour. Such currents are usual wherever groups of islands confine the tide water within certain definite channels, and they have also the effect of concentrating the floating food in the channels, or whenever tides meet. Both of these conditions are essential to successful sponge growth, namely, a continuous renewal of aërated water and a plentiful supply of food, and are probably partly the cause of their abundance in such places. This entirely agrees with my own observations upon many species on our own coast of Chalininæ and Halichondrida. Constant reference to physical influences is also noticeable in the map prepared by Von Eckhel, and in the method of classification adopted by him. The marketable qualities are described as "sorts," and the different "sorts" designated by letters, as "sort A," "sort B," and so on. These sorts he has found it most convenient to arrange according to localities, and thus under some "sorts" we have all the three species represented; all, however, from the same place, and all having some local peculiarity which makes them either of superior or inferior quality. The author also frequently refers to the slimy character of the bottom as a reason for inferiority or dark colour. On the American side of the Atlantic this is also shown by the great difference in point of colour and fineness between the Nassau and Key West sponges. The former are lighter coloured, finer, more elastic and more durable than the same species at Key West, where the colour is so dark that it designates at once the locality from which the specimen came. Again the shallow water sponges are coarser than the deep water forms. This is probably due, in part, as in other species, to the quantity of sediment, which is of course less in deep than in shallow water, as for example, at Key West in the winter time. I am informed, in this connection, by Mr. Saltonstall, who made inquiries for me among the spongers, that no fine qualities of any sponges are found within the limits of the milky water, but all the finer qualities of the marketable kinds in the deepest water in which the species occur, except, perhaps, in the case of the Reef sponge. Glove, Reef and Hard-head are fished in shallow waters, greatest depth two fathoms, and the other and generally finer marketable varieties, from two to five fathoms. This fact also explains, in a measure, but not wholly, the greater coarseness of American sponges as compared with the European; for though it may be assumed from the examination of the skeletons that Mediterranean sponges are much less exposed to turbid waters, and though it may be shown by the microscope that the primary fibres contain less débris, this does not wholly explain their greater fineness and elasticity. I think that we may attribute this either wholly or partly to climatic conditions.

If either the temperature or density of the water had been exceptional, we might have gained some additional information, but as it is, we cannot assume that either cause would have been sufficient to account for the absence of the Spongiæ from the Euxine. According to Carpenter in his articles on the Mediterranean and Black Sea, there is a strong current continually flowing at the depth of twenty fathoms from the Mediterranean into the Black Sea, and a return surface current from the Black Sea into the Mediterranean. The sponges occur necessarily in the shallower waters of the Sea of Marmora, since they are said by Von Eckhel to be fished for mostly with the harpoon, and are probably exposed more or less to the influence of the surface current. Under these circumstances they must very often be able to endure a degree of cold during the winter, and an amount of change in the density of the water, for which it becomes difficult to account, even taking into consideration the inferior quality of their skeletons. It is possible, however, that the water of the northern part of the Black Sea may not affect the temperature of the southern part to such an extent as would at first sight appear probable, and that, notwithstanding the lower temperature of the northern shores, the general temperature of the surface water during the winter immediately east and west of the Bosphorus may not fall below 55° as a minimum.

The northern shore of the Ægean Sea and the eastern shore of the Adriatic Sea are populous with sponges, and yet the former throughout its whole extent, and the latter from Ragusa to Istria, have nearly the same average winter temperature, and possess a colder climate in winter than the coasts of southern Italy or Spain, where no Spongiæ exist. Again, upon consulting the invaluable little Eckhelian pamphlet, we find that the sponges correspond in quality to this climatic change. The sort found at the head of the Ægean is said to be the *Spongia officinalis* alone, and to have a "heavy, hard, close, very hairy skeleton, often containing slime," and it is further added that it is not much liked, and is usually fished with the harpoon. The same species exist also alone at corresponding localities along the shore of the Adriatic, and at the extreme locality, the Island of Istria, upon the limit of its distribution, it is said to be very rare, the form to be ugly, the skeleton hard, the colour dark. Farther south, along the Dalmatian coast, it becomes abundant, finer in texture and of a lighter colour, but it is still inferior to the more southern or Levantine variety. In considering such classes of facts, it must also be borne in mind that the habitat of a certain sort or variety may largely determine the quality of the skeleton, even where the temperature may be very favourable. Thus, to the south of Quarnero, among the islands, a much better quality of *Spongia officinalis* occurs than in the milder sea about the Ionian Islands, which, as Eckhel remarks, is probably attributable to the slimy character of the bottom.

The finest sponges in the Mediterranean, those of the Levant and off the Syrian and Tripoli coasts, are found between the average aerial winter temperatures of 63° and 70°, and the isochrymals of 50°-57°, and at no time of the year are these, which, as stated by Von Eckhel, occur in the deeper water at a distance from the coast, probably exposed to a lower temperature than 60°.

In describing the species of this genus I have made comparisons between three principal Mediterranean, and three of the American commercial sponges, in order to show the very evident relationship of these forms. Schmidt describes five Mediterranean species in all, and may be right; but so far as I can understand his descriptions, with the aid of a fine collection of specimens purchased by Prof. Baird for the National Museum from Mr. Isaacs, of New York, I cannot make more than three out of the ordinary commercial varieties, which were fully represented and appeared to include the entire range of his five species. Von Eckhel's work upon the 'Badeschwämme,' although a purely commercial treatise, has the same view of the affinities of the sponges, based upon the observations of the fishermen and dealers, and the distribution of the species; the latter is quite remarkable. Only one species, the *Spongia officinalis*, Linn., *Adriatica*, Schm., is found on the eastern shore of the Adriatic and coast of Greece, from Trieste to the Bay of Nauplia. From Nauplia and the island of Candia to Eritra, on the coast of Asia Minor, two occur, *Spongia officinalis* and *Spongia agaricina*, Pall., *Zimocca*, Schm. From Eritra, opposite the island of Chios, to Tripoli, all three, *Spongia officinalis*, *agaricina* and *equina*, are fished, except at the island of Cyprus, where the *Zimocca* sponge does not live. From Tripoli to Tunis two only occur, *Spongia officinalis* and *equina* and from thence to Ceuta, at the Straits of Gibraltar, a very peculiar dark-coloured and coarse variety of the *Spongia equina* is obtained, called the Gerbis sponge.

(*To be continued*).

The Pharmaceutical Journal.

SATURDAY, AUGUST 11, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE BRITISH PHARMACEUTICAL CONFERENCE.

Now that the time has so nearly arrived when the British Pharmaceutical Conference will hold its Fourteenth Annual Meeting in the town of Plymouth, it may be of service to intending visitors, and of interest to many who will have to stay away, to bring together within a small compass what is known of the local arrangements up to the present time.

The meetings of the Conference will be held on Tuesday and Wednesday next, in the Athenæum, George Street, Plymouth, the chair to be taken at 10 a.m. each day. After the usual business of the reception of delegates from pharmaceutical associations, the Report of the Executive Committee and that of the Treasurer will be submitted, and then the Inaugural Address will be delivered by the President for the year, Professor THEOPHILUS REDWOOD, Ph.D., F.C.S. The reading of papers will follow, and, as will be seen from the list published below, these appear to be already numerous enough to test the Chairman's skill in confining the proceedings within such limits as will allow of them being read and discussed in the allotted time. Amongst the papers may be noted five reports on the results of investigations towards the expenses of which grants have been made from the Conference funds.

An adjournment will take place each day from 12.30 until 2 p.m. Luncheon will be provided at the Mechanic's Institute, Princess Square, and Luncheon Tickets will be issued by the Local Secretaries to all who attend the meetings.

The business portion of the Conference will terminate on Wednesday afternoon, giving such members as wish so to do the opportunity of hearing the President of the British Association deliver his Address. Next morning, Thursday, the 16th, the Local Committee, acting on behalf of the pharmacists of Devon and Cornwall, invite the visitors to the Conference to accompany them on a steam-boat excursion over the course we were enabled to sketch a short time since. The "Eleanor" will leave the Millbay pier punctually at 9 p.m., and after calling at North Corner, Devonport, proceed through the harbour to the Hamoaze, and up the river Tamar. Stoppages will be made at Pentillie, Cotehele, and Calstock, and it is intended to return in time to reach Mount Edgcumbe about 4 p.m. Here those who wish it will land, whilst the steamer proceeds for a further cruise to Cattewater and Bovisand, and thence to the Breakwater and Cawsand Bay, returning to Mount Edgcumbe about 5 p.m. Luncheon and refreshments will be provided on board by the Committee, and a "High Tea" will be served in the Orangery or private gardens at Mount Edgcumbe on the return of the boat from her trip across the Sound. Visitors desirous of taking part in this excursion should intimate their wishes as soon as possible to the Local Secretary, Mr. ROBERT CLARKE, 77, Old Town Street, Plymouth, who will supply them with tickets. A separate ticket will be required for admission to Mount Edgcumbe Park.

The following is a list of the Papers expected to be read at the meetings on Tuesday and Wednesday, corrected up to the present time:—

1. The Supply of Cinchona Bark as connected with the Price of Quinine. John Eliot Howard, F.R.S.
2. Report of the Committee on the Extraction and Investigation of the Aconitines of *Aconitum Napellus.* Dr. Wright, F.C.S., J. Williams, F.C.S., and T. B. Groves, F.C.S.
3. Report on the Active Principle of Cayenne Pepper. J. C. Thresh, F.C.S.
4. The Pill Masses of the B.P., which are of Inconvenient Consistence or acquire that Consistence by Keeping. J. C. Thresh, F.C.S.
5. Report of Continued Researches on Essential Oils. Dr. Tilden, F.C.S.
6. On a Product of the Oxidation of Barbaloin and Socaloin. Dr. Tilden, F.C.S.
7. Report on the Proximate Constituents of Ivy Berries. R. H. Davies, F.C.S.
8. Report of a Research (part 2) on Essential Oil of Sage. M. M. P. Muir, F.C.S., and Mr. Siguira.
9. An Impurity in Oxide of Zinc. W. W. Stoddart, F.C.S.
10. The Microscope in Pharmacy. Mr. J. Cooke.
11. Additional Notes on the Assay of Opium. Mr. B. S. Proctor.
12. Tincture of Acetate of Iron. Dr. C. R. C. Tichborne, F.C.S.
13. Sugar in Pharmacy. Dr. C. Symes.
14. A Point in Pharmaceutical Ethics. Mr. S. R. Atkins.
15. Proximate Principles of *Narcissus Pseudo-narcissus.* Mr. A. W. Gerrard.
16. The Alkaloids of Japanese Aconite. Dr. Paul, F.C.S, and C. T. Kingzett, F.C.S.
17. Preserved Foods and Copper. Dr. Paul, F.C.S., and C. T. Kingzett, F.C.S.
18. Analyses of Preserved Carrots, Potatoes, Cabbage, and Mixed Vegetables. Professor Attfield.
19. Scammony Root. C. T. Kingzett, F.C.S.
20. Further Note on the History of Tea Hair. Thomas Greenish, F.C.S.
21. Copaiba Testing. Louis Siebold, F.C.S.
22. A New Medicinal Solution of Phosphorus. Mr. W. W. Urwick.
23. Blood Albumen. C. T. Kingzett, F.C.S.
24. Note on Pilocarpine. C. T. Kingzett, F.C.S.
25. Note on Hederic Acid. C. T. Kingzett, F.C.S.
26. Effects of Variations of Temperature on Boiled Putrescible Liquids. Mr. W. Willmott.
27. Suggestions for a Small Practical Laboratory. G. F. Schacht, F.C.S.
28. A Glance at the Materia Medica of Devon. E. Smith, F.C.S.

THE BRITISH MEDICAL ASSOCIATION.

On Tuesday last the British Medical Association commenced its forty-fifth annual meeting in Manchester. As usual the members first attended Divine Service, which was held in the Cathedral, the sermon being preached by the Bishop of Manchester, from 1 John, iii. 2. In the afternoon the first General Meeting was held in the Concert Hall, when the retiring President, Dr. Bartolomé, made way for Dr. M. A. Eason Wilkinson, of Manchester, the new President. Dr. Bartolomé, in some valedictory sentences, remarked that during his year of office the colliers of Pontypridd had been rewarded for their heroism, but the medical men had not. It had therefore been decided by the Council of the Association to have a medal struck for presentation in recognition of the noble behaviour of those gentlemen, and it had been further recommended to adopt the medal as the medal of the British Medical Association. The programme included the reading of papers, etc., on the three succeeding days; also a *soirée* given by the Mayor and Corporation at the Town Hall, on Wednesday, and a public dinner on Thursday. The attendance was very good.

THE POISON SCHEDULE TO THE PHARMACY ACT.

We have been favoured by the Registrar of the Pharmaceutical Society of Ireland with a Copy of a Chart that has been issued by the Council of that Society. It contains a list of the "Dangerous Medicines," with their doses, as contained in the British Pharmacopœia, and a List of the Poisons contained in the Poison Schedule to the Irish Pharmacy Act. We are not prepared to say how far it is necessary in the sister island to reproduce in this form the posology contained in the British Pharmacopœia, but we think it very probable that the attempt to diffuse correct information as to the law in respect to the sale of poisons will be very useful. In our law reports this week, for instance, a coroner is represented as gravely talking about the provisions for the sale of laudanum laid down in the Pharmacy Act, 1868, being overridden by those of the Pharmacy Act, 1877.

A relative of Mr. Sangster who was one of the Successful Candidates for the Bell Scholarship writes to correct the incidental statement of the President that he understood his father was a stoker or engineer on board H.M.S. *Spitfire*. This remark was not intended in any way to disparage either Mr. Sangster or his father, but had simply reference to the principle upon which the Bell Scholarship was established of furnishing assistance "for young men less favoured by fortune than by industry."

Provincial Transactions.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The half-yearly meeting of the members of the Association was held at the rooms, Halford Street, on Thursday, the 26th July last. The report, which was very favourable, having been read, was unanimously adopted. It stated that two prizes had been offered for competition by the Association, and two others by Messrs. Lloyd and Hammond, the successful candidates being Messrs. Lewitt, Crane, Garrett, and Mason. The average attendance at the classes had been nine, which though a slight decrease on that of previous sessions, was regarded as satisfactory, considering the counter attractions during the summer months. Forty-one meetings of classes had been held, conducted respectively by Messrs. Hammond, Clark, Raynor, and Garrett; also four special and interesting lectures had been delivered by W. Johnston, Esq., M.D., F.G.S., W. J. Harrison, Esq., F.G.S., Mr. W. B. Clark, and Mr. E. Jones; also an exhibition of microscopic slides has been given by Mr. J. J. Edwards; and to each of these gentlemen the Committee desired to tender their sincere thanks, as well as to the honorary members, for their constant kindness and liberality. After the transaction of routine business the members proceeded to elect the Committee for the ensuing session, with the following result:—Mr. T. C. Raynor, president; C. B. Lomas, vice-president; W. Hammond, hon. secretary; W. B. Clark, treasurer; E. H. Butler, J. Garrett, Chas. Hodgson. The Treasurer's report showed that the receipts during the half-year had amounted to £4 14*s.* 11*d.*, and the payments to £13 6*s.* 6*d.*, leaving a balance of £1 8*s.* 8*d.* A programme of lectures, classes, etc., extending to the 31st of January next, was also announced.

On Tuesday, August 7, a tea was held at the Association Rooms, Halford Street, after which the President, Mr. T. C. Raynor, read his inaugural address; songs and readings were also given by various members of the Association.

In the course of his remarks, after giving a brief sketch of the past history of the Association, the President said that during its earlier years it was found that many of the students had not passed the Preliminary examination, and classes had to be formed on their behalf. These classes were discontinued afterwards, owing to the old members having passed, and the apprentices being able to pass upon entering the trade. This made a great improvement in the social aspect of the Association, it placed all the students upon the same footing, and caused them to work with a will towards passing the other examinations. Soon after the Association had started, it was found desirable that the shops should close earlier, so that the assistants and apprentices might have a better opportunity for study; this object was supported, and is still kept up by nearly all the chemists in the town. The Association had steadily increased from the first, and it had now a good museum, a library, a microscope, and laboratory. Thanks were due to many members, both past and present, for the interest they had taken in the welfare of the Association, to the members and the Pharmaceutical Society for the pecuniary aid they had given, and to the wholesale firms who so kindly presented the specimens and bottles. After some remarks on the best method of conducting classes, and the advantages students might obtain through attending them, the President directed attention, in conclusion, to the *Pharmaceutical Journal*, as containing many articles in it worth reading. The mention of new medicines there, if noticed and understood when they appeared, would save a deal of trouble in referring for or inquiring about them, when they come into general use. The article appearing at the end of the month, entitled "The Month," should have special notice; it being a condensed report of articles brought under the notice of the trade during the month. The botanical portion was very interesting, giving an account of plants in flower during the month, and where to be found; also some very good botanical notes upon some of the plants mentioned.

Proceedings of Scientific Societies.

NEWCASTLE-ON-TYNE CHEMICAL SOCIETY.

The Estimation of Nitrous and Nitric Acids.

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Some time ago I proposed to myself to study the action of sulphur dioxide on the solution of chamber crystals, or, more scientifically speaking, of nitrosulfonic acid, $SO_2(OH)(NO_2)$, in sulphuric acid, which constitutes the acid flowing from the "absorbing columns" of sulphuric acid works, and which is commonly called "nitrous vitriol." Although this action is utilized every day on a very large scale in most sulphuric acid works, viz., in all those employing the denitrating columns invented by Mr. Glover, and bearing his name, there are great varieties of opinions existing as to its nature. Some of the contradictions arising out of these controversies, which have been more particularly carried on in German periodicals, appeared to me to arise from imperfect modes of testing for nitrous, and perhaps even for nitric, acid, and it thus became the first portion of my task to thoroughly examine at least those methods of estimating the acids of nitrogen which have been proposed or used for testing "nitrous vitriol."

1.—*Estimation of Nitric Acid.*

One of the oldest and probably the most widely used methods of estimating nitric acid is that first proposed by Pelouze, but considerably modified afterwards by Fresenius, viz., dissolving metallic iron in hydrochloric or sulphuric acid, adding the compound containing nitric acid, or one of its salts, heating till the action of NO_3H on the ferrous salt is complete, and all NO is given off, and estimating the unoxidized portion of the ferrous salt by means of potassium bichromate or permanganate. In the latter case sulphuric acid must be employed for dissolving the iron. If the air has access to the liquids during these operations, there may be some oxidation of ferrous to ferric sulphate, at the expense of atmospheric oxygen; but a more serious source of error is the regeneration of nitrogen acids from the evolved NO, which act again upon ferrous sulphate, and thus too high a proportion of nitric acid is indicated by the process. The process, as originally proposed by Pelouze, is certainly altogether faulty; but it became most accurate when Fresenius proposed to conduct the operation with a number of precautions the most important of which is the carrying on of the whole process in an atmosphere of carbon dioxide. The process of Fresenius is, however, somewhat lengthy and complicated, and entails the use of cumbrous apparatus, and this would militate against its use in many, especially in all works', laboratories. A modification is therefore adopted by very many chemists, consisting in dispensing with the current of CO_2, but conducting the operation of dissolving the metallic iron and partly oxidizing the solution by nitric acid or its salts in a flask, fitted with a Bunsen's india-rubber valve; that is to say, a cork, through which passes a short glass tube open at both ends, but closed at the outer end by means of a small piece of india-rubber tubing and a bit of glass rod stopping the latter again. The india-rubber tubing is provided with a sharp longitudinal incision of about one centimeter's length, which allows any gas or vapour to pass out, but none to enter into the tube, and thence into the flask. In this apparatus the steam arising from the boiling liquid soon expels the air, and prevents its injurious action upon the accuracy of the process; nor can the air enter again on cooling, as the valve prevents it from doing so, so that a vacuum is formed in the flask, which ought to be of strong glass to resist the atmospheric pressure. This apparatus is so very simple that even the smallest laboratory can use it; but doubts have arisen whether the results obtained by it are really trustworthy. I have, therefore, made with this apparatus a number of experiments (nine), in which I worked with every possible precaution against error, and in which I employed exactly known quantities of nitric acid or potassic nitrate. In order to save the time consumed by cleaning, accurately weighing, and dissolving the iron wire, I employed in this series of experiments, as well as in all those following, a solution of pure ferrous sulphate (100 grams per litre), acidulated with 5 per cent. of sulphuric acid. Of this solution a certain volume, more than sufficient for the nitric acid contained in the test liquid, was employed, and a similar volume was tested at the same time by a standard solution of potassium permanganate; one such standardizing of the iron solution is sufficient for a whole day, as the free acid prevents its too rapid oxidation. The potassium permanganate solution itself was made from pure crystals and standardized once a week with pianoforte wire in the same apparatus (taking 100 wire to contain 99·6 Fe); it was found to be unchanged after a month's standing.

The time consumed by each test till the NO was completely driven off was very inconveniently long, unless a large quantity of free acid was present, say 20 parts of SO_4H_2 to each 100 parts of liquid. If there is less acid present, the reaction, as shown by the colour of NO dissolved in the solution of the ferrous salt, goes on extremely slowly, or, with great dilution, not at all, until by prolonged boiling the above concentration has been reached. It is, therefore, convenient to add a sufficiently large quantity of pure strong sulphuric acid at once, in order to hasten the progress. A pinch of sodium bicarbonate may be thrown in as well to fill the vessel with CO_2, but my results were as accurate without as with this modification.

With proper precautions, especially if the concentration and temperature of the liquids are not such as to cause an instantaneous reaction before the air has been expelled from the apparatus by aqueous vapour, the results obtained in all the nine experiments made by this process are as accurate as it can be expected by any method; and it can be recommended to chemists even in its simplified form, as described above.

I have also made a number of experiments with the process first proposed by F. Schulze, and modified by many subsequent chemists, viz., the reduction of nitrogen acids in an alkaline solution by means of iron or zinc; (aluminium has also been used for this purpose). The total nitrogen is thereby supposed to be converted into ammonia, which is collected in hydrochloric acid of known strength, and estimated by re-titrating the same. Nearly the whole of my experiments were made according to the prescription given by Siewert (*Annalen der Chemie und Pharmacie*, vol. cxxv., p. 293); he employs an alcoholic solution of potash in order to prevent the violent bumping of aqueous solutions of caustic alkali and a mixture of zinc and iron, similar to Harcourt's process, published about the same time. From the latter I adopted the recurved gas-delivery tube and the inclined position of the reduction-flask, as a precaution against spurting over of any fixed alkali. I had, however, to use caustic soda in the place of caustic potash, as I could not procure the latter free from nitre, and it is just possible that the apparently good results obtained by this process may in some cases be due to the employment of impure potash. I for my own part, working with rigid accuracy and, if anything, overdoing all the precautions prescribed for this process (for instance, allowing the mixture to stand some time and distilling very slowly, say three to four hours), never obtained any satisfactory results. The ammonia produced fell short, in six experiments, from 16 to 26 per cent. of that calculated from the pure potassic nitrate, etc., employed. Nor could I better the case by some experiments tried with the original plan of Schulze's, and by a modification proposed by Hager. A number of chemists have come to the same conclusion, viz., that the process of estimating nitrates by reduction in an alkaline solution cannot be depended upon; and although a number of other chemists certainly have obtained accurate results by it, this may be due partly to the fact that in some special circumstances the process does work well, whilst it does not in other cases, and partly to a compensation of the loss of ammonia by the nitre consumed in the potash employed, or by carrying over of fixed alkali. A process which gives such uncertain results in spite of scrupulously carrying out the prescriptions given for it, ought not to be resorted to so long as any other process of undoubted accuracy is available.

2.—*Estimation of Nitrous Acid.*

In this case the discrepancies among the results obtained by different chemists are still greater—probably because the methods have not been controlled in many cases by means of a substance of absolutely certain composition. As such I employed silver nitrate, obtained by mixing a hot solution of silver nitrate and of sodium nitrite; it was recrystallized twice from boiling water, and dried *in vacuo* over sulphuric acid. Its purity was proved by igniting it.

0·4780 grm. yielded 0·3357 Ag.; theory 0·3352.
0·5057 „ „ 0·3532 „ „ 0·3546.

By means of this, several test-liquids of artificial "nitrous vitriol" were made. Each time 5 grams of pure $AgNO_2$ were dissolved in 500 c.c. of pure concentrated sulphuric acid of a density of 1·842 at 15 degrees C. in such a way that the salt only came into contact with the acid at the bottom of the vessel, so that the N_2O_3 evolved was immediately dissolved by the acid, and only one or two bubbles of it escaped. The sulphuric acid employed was absolutely free from nitrogen compounds, as proved by the most delicate of all reagents—diphenylamine. The liquid obtained was perfectly clear, the silver sulphate dissolving in the strong acid.

This liquid was used for testing with potassium permanganate and potassium bichromate with urea, and the silver nitrite was tried directly by reduction in an alkaline solution (Siewert's process). It should be stated from the outset that the only really accurate method for estimating N_2O_3 was proved to be that by means of potassium permanganate (first proposed by Feldhaus); but this plan also is only perfectly accurate when used in the less convenient form of running the nitrous vitriol from a burette into a measured quantity of permanganate, so as to oxodize the N_2O_3 momentarily before it can split up into NO and NO_3H (with the water present) since a certain quantity of NO always escapes if the opposite plan be followed—that of running the permanganate into the nitrous vitriol. Only in one way the latter plan gave approximately good results; perhaps near enough for factory work, but never quite accurate, viz., if either the nitrous vitriol was used undiluted, the bulk of the permanganate necessary for its oxidation was run upon it, the strata were allowed to mix very slowly and ultimately permanganate added, till the pink colour remained; or, if the nitrous vitriol—say 5 or 10 c.c.—was run by means of a pipette down to the bottom of a large quantity of water - say 500 c.c.— without mixing them at first, and then permanganate was run in, so that the reaction takes place more in the lower part of the liquid. The first plan has been proposed by Mr. Crowder, the second one by Professor Winkler (in an unpublished letter to myself). A very large number of tests were made by every one of these modifications, but there was always a certain loss of N_2O_3, and only by the process of running the nitrous vitriol into the permanganate solution, really accurate and wholly constant results were obtained. The permanganate solution was employed as a semi-normal one; that is to say, giving up 0·004 oxygen for each c.c., or indicating 0·0095 N_2O_3. It had to be diluted pretty strongly—say 1·20 water—to avoid too great a heating. When the temperature of the measure rises above 80° C., the results are no more accurate; from 30° to 40° C. is the most convenient temperature, as then there is no danger whatever of any over-heating, and at the same time the reaction takes place much more rapidly than in the cold. When ordinary nitrous vitriol of about 1·7 specific gravity is employed, the rise of temperature caused by its mixing with the test solution is only slight, and it is convenient to dilute the permanganate with tepid instead of cold water, in order to hasten the reaction.

Potassium bichromate has been used for years in the Tyne district for testing nitrous vitriol, and the same has been introduced into many German works by Gerstenhöfer. It is employed precisely in the same way as the permanganate, according to that plan which I have found to be the most accurate one, viz., pouring the nitrous vitriol out of a burette into a measured quantity of potassium bichromate of known strength. Its colour thereby changes soon into brownish green, and at a certain point there is a sudden change into blue green, which shows the end of the reaction. After some practice this point can be hit with great nicety, but there is always an uncertainty to the amount of several drops, whilst with permanganate no experienced eye is required, and it is easy to work to a single drop. Since stable test solutions can be obtained by employing pure crystallized potassium permanganate, there is no reason left for the use of the less convenient bichromate.

Bleaching powder has also been used for the same purpose, and it seems to work tolerably well, to judge from the experiments of Mr. Davis (*Chemical News*, vol. xxv., p. 124), but, as the only recommendation in its favour can be cheapness, and in every other respect it is necessarily inferior to permanganate, I have not even drawn it into the range of my experiments.

I have further tried Siewert's method (reduction by zinc and iron in an alcoholic solution of potash), but on finding no more accurate results with silver nitrite than I had previously found with potassium nitrate, I at once abandoned this tedious and troublesome plan, which has no *locus standi* beside any of the methods mentioned hitherto.

A good deal of time was, however, spent with the urea method, which has been recommended as the most accurate test for nitrous acid—first by Peter Hart (Muspratt's 'Chemistry,' ii., 1040). Mr. Hart does not appear to have tested the method by pure silver nitrite (the only reliable way), but simply to have inverted Millon's urea test, and to have assumed, from theory, that the only reaction taking place is the following:—

$$CON_2H_4 + N_2O_3 = N_4 + CO_2 + 2\,H_2O.$$

Nitrous vitriol is dropped into a boiling solution of nitrate of urea until a drop of the liquid shows an excess of N_2O_3 to be present by staining blue a mixture of starch and potassium iodide in solution. I cannot conceive that this method could ever have come into extended application. Even the costliness of pure nitrate of urea must have deterred most chemists—certainly nearly all factory chemists—from its use, otherwise its utter worthlessness would have been proved more universally before. Working with all precautions, I found that 1·230 grm. of nitrate of urea required in two experiments 18·0 and 17·5 c.c. of my artificial nitrous vitriol (prepared with silver nitrite), instead of 32·5 c.c., which it ought to have taken, and that up to the point when the starch and potassium iodide were stained blue instantaneously. But long before this point the coloration took place after a few seconds' contact, so that it is impossible to say with any degree of accuracy when the end of the reaction had come. Nor can it be expected that Hart's method should give any accurate results since Claus has proved ('Berichte der Deutschen Chemischen Gesellschaft,' iv., 140), that the reaction between urea and nitrous acid is anything but so simple as assumed by Mr. Hart, and that a considerable quantity of ammonium salts is formed thereby.

I also tried the plan proposed by Mr. Crowder (read before our Society in 1871 and further published in the *Chemical News*, vol. xxiv., p. 237), viz., to put a certain quantity of nitrate of urea in a Geissler's apparatus for estimating carbon dioxide; to run the nitrous vitriol into the delivery flask from the stoppered side tube, and to calculate the N_2O_3, present from the loss of weight corresponding to the N and Co_2 formed. The four following results were obtained, viz.:—

1. Employed: 26·8095 nitrous vitriol, containing 0·0359 N_2O_3; found, loss of weight, 0·0463 = 0·0357 N_2O_3.
2. Employed: 25·6670 nitrous vitriol = 0·03421 N_2O_3; found loss of weight = 0·0472 = 0·03587 N_2O_3.
3. Employed: 25·2250 nitrous vitriol = 0·03361 N_2O_3; found loss of weight, 0·0490 = 0·0372 N_2O_3.
4. Employed 26·2163 nitrous vitriol = 0·0347 N_2O_3; found loss of weight, 0·0562 = 0·0427 N_2O_3.

It will be seen that the results obtained by Crowder's process are a great deal nearer the truth than those of Hart's process, but they are still very unequal, and sometimes very inaccurate, and as the process is both costly and tedious, requiring, as it does, three accurate weighings of a heavy apparatus on a delicate balance, it cannot for a moment hold its ground beside the permanganate process, which takes a few minutes for its performance, and even in its less accurate forms, as described above, gives far better results than the urea process. Mr. Davis (*Chemical News*, vol. xxv., p. 124) has had similar unfavourable experience with both Hart's and Crowder's process. He likewise recommends the permanganate process, but without basing his judgment on the examination of a material of certain composition, such as silver nitrite.

III. Estimation of Nitrous and Nitric Acid in the Same Sample.

This can be effected in the most satisfactory way by first oxidizing the nitrous acid by means of standard potassium permanganate, then adding a measured volume of a solution of ferrous sulphate of known relation to the permanganate, and finishing the process as prescribed for the estimation of nitric acid. From the total quantity of nitric acid thus found a deduction is made for that corresponding to the N_2O_3, the difference corresponding to the nitric acid originally present. It is only necessary to deduct one and a half times the number of c.c. first consumed for oxidizing N_2O_3 into N_2O_5, from the number afterwards found (in the shape of ferrous sulphate) consumed for reducing N_2O_5 to N_2O_2; the remainder will show how much N_2O_5 (or rather NO_3H) was present. The whole operation is carried on from beginning to end in the same flask, fitted with a Bunsen's india-rubber valve, as above described. This I proved to be altogether correct by dissolving some pure potassium nitrate in my artificial nitrous acid prepared with silver. On testing, as by the plan just described, I found—

1. Employed 0·2010 KNO_3, found 0·2012.
2. ,, 0·1950 ,, ,, 0·1936.

A third blank experiment was made with the nitrous acid without adding any potassium nitrate. Originally used 12·0 c.c. permanganate; found to require for reduction, ferrous sulphate equal to 15·15 c.c. permanganate instead of 15·3; the 0·15 c.c. of permanganate used in excess of the theoretical quantity in retitrating the iron solution would be required for staining the large volume of liquid obtained at the end, so that the blank experiment may be declared to be quite satisfactory.

IV. Analysis of Nitrous Vitriol from a Sulphuric Acid Works.

It seemed to be desirable to apply the just-described process to the analysis of nitrous acid obtained on a large scale from the absorbing column of a sulphuric acid works. I procured such from a factory on the borders of the Lake of Zürich. It had a specific gravity of 1·691, and was evidently almost saturated with N_2O_3. Eleven experiments proved it to contain 4·13 grams. N_2O_3 in 100 c.c. of acid (= 2·44 per cent. by weight). Now, the published analyses of nitrous vitriol generally mention the presence of NO_3H in the same as well. For instance, Winkler found 0·256 per cent., Kolbe even 0·9 and 1·14 per cent., calculated as N_2O_5. It is not, on the face of it, clear how nitric acid can get into nitrous vitriol, since it cannot very well bodily traverse the chambers without being reduced to lower nitrogen oxides; and since it is not regenerated either from the latter in the presence of sulphuric acid, the oxidation in this case never going beyond N_2O_4, as proved by Winkler himself. Experiment has proved in my special case that the nitrous vitriol really contained no NO_3H whatever. The additional permanganate, over and above that corresponding to N_2O_3, amounted, in two experiments, to 0·05 and 0·1 c.c., which is just sufficient to stain the liquid; and I am inclined to believe that nitrous vitriol really does not contain any nitric acid, except perhaps traces, in any case, for I was able to show by experiment, performed purposely by the faulty method generally in use, that nitric acid was generated during the testing process where it did not exist before. My artificial nitrous acid prepared from pure $AgNO_2$, and thus absolutely free from NO_3H, required, as mentioned above, for its reduction, after oxidation to NO_3H by means of permanganate, as nearly as possible exactly the theoretical quantity of ferrous sulphate, viz., that corresponding to one and a half times the quantity of permanganate first used. But this was only the case when the oxidation had taken place in the way described by me as the only accurate one, viz., by dropping the nitrous acid into the permanganate. When, purposely, the opposite way had been employed, viz., diluting the nitrous vitriol with very much water, then oxidizing by permanganate and reducing again, the following results were obtained:—

1. Real percentage in 100 volumes of acid, 0·235 N_2O_3, 0·000 N_2O_5. Found by the above faulty method, 0·180 N_2O_3, 0·045 N_2O_5; the latter corresponding to 0·027 N_2O_3. leaves 0·028 for absolute loss (probably as NO).
2. Found 0·199 N_2O_3, 0·036 N_2O_5, the latter corresponding to 0·021 N_2O_3, leaving 0·015 for absolute loss.

It was thus positively proved that, by the more usual plan of testing nitrous vitriol, nitric acid is generated in the process of dilution, according to the equation:—

$$3\,NOOH = 2\,NO + NO_2OH + H_2O.$$

Parliamentary and Law Proceedings.

The Personations at the Preliminary Examination.

At the Central Criminal Court on Tuesday last, the 7th of August, 1877, before the Recorder, the cases of Regina (on the prosecution of the Pharmaceutical Society of Great Britain) against Frank Oates, and Andrew Ritchie Hunter; and Regina (on the like prosecution) against George Frederick Webb, and Andrew Ritchie Hunter, were heard.

Mr. Douglas Straight, instructed by Messrs. Flux and Co., appeared on behalf of the prosecution. Mr. Grain appeared on behalf of Frank Oates and George Frederick Webb.

In each case the indictment was for a conspiracy that at preliminary examinations duly held by the Pharmaceutical Society of Great Britain at Brighton and Reading respectively, the defendant, Andrew Ritchie Hunter, with the connivance, and by the procurement of the other accused person, did present himself, and in the name of and for the other accused person did undergo the said examinations as if he, the said Andrew Ritchie Hunter, then was the said other accused person, and did personate the said other accused person at the said examinations respectively.

On the cases being called all the accused pleaded Guilty.

Mr. Douglas Straight, on behalf of the prosecution, brought under the attention of the judge the fact that Hunter had on a former occasion been found guilty of a similar offence.

Counsel for the defendants Oates and Webb called witnesses as to character.

The Recorder sentenced Hunter to six months imprisonment, and in regard to the two other defendants, directed that they should enter into their own recognisances to appear and receive judgment if hereafter called on.

The Sale of "Castor-Oil Pills."

At the Christchurch petty sessions, on Monday, July 30, before the Hon. R. Douglas, Messrs. W. W. Farr, G. T. Lowth, W. C. Dean, Stuart, R. Stevens, and Entwisle, and Dr. Gream,

Mr. Alexander Duncan, chemist and druggist, of the Commercial Road, and Lansdowne Crescent, Bournemouth, was summoned for having on the 22nd of June, at the parish of Holdenhurst, unlawfully sold to William White, a certain drug which was not of the nature, substance, and quality of the article, to wit castor-oil pills, then and there demanded by the said William White, to the prejudice of the purchaser.

The defendant pleaded not guilty.

Superintendent White deposed: On the 22nd of June, I went to Mr. Duncan's branch shop at Lansdowne, Bournemouth, and asked for a shilling's worth of castor-oil pills. I was served with a box containing a number of pills, for which I paid a shilling. I then told the person in the shop, Mr. Duncan's assistant, that I was going to send them to the public analyst to be analysed, and offered to divide them in three parts. The assistant said that it was not necessary. The same day I sent them to Mr. Arthur Angel, the county analyst, Southampton, in a registered letter. On the 1st of July, I received a certificate from the analyst and a box containing a part of the samples.

In cross-examination Mr. White said he had heard since he made the purchase that it was the common practice to call such pills castor-oil pills, but he did not know before then that ordinary purgative pills were universally sold as castor-oil pills in this part of the country. He was not aware that castor-oil pills would be useless.

The certificate, which was put in, stated that in the analyst's opinion, the sample of pills contained rhubarb, aloes, peppermint, oil, and soap, and that the application of the term castor-oil to these pills was a dangerous practice and might be attended with injurious results by leading the purchaser to understand that the active ingredient of the pills was castor-oil.

Mr. Lacey objected to the latter statement being taken as part of the certificate. All the analyst had to do was to analyse the sample and state the particulars of the analysis. Extraneous matter ought not, he urged, to be brought into the certificate.

The Chairman: Where is that laid down?

Mr. Lacey: Nowhere, but it is clear to everyone that it is no part of the certificate.

The Bench overruled the objection.

Mr. Lacey then proceeded to address the bench on behalf of the defendant. The very gist of the offence, he observed, was that it should be "to the prejudice of the purchaser," which words were inserted in the bill when it was passing through committee, and it could not be said that the purchaser had been prejudiced in this case. These pills had been known to the public and to the medical and chemical profession for several years as castor-oil pills, and it had been universally the custom to call them so. The pills in question were very much more valuable than pills made of castor-oil would be; for only one grain of castor-oil could be contained in one pill, so that it would take from 200 to 400 pills for one dose. Therefore it had been the custom for 25 or 30 years to sell such pills as those in question as "castor-oil pills;" the custom, he believed, originated at Bournemouth, through people who desired a mild aperient asking for castor-oil pills, and being supplied with something very much better. This could not be to the prejudice of the purchaser.

The Chairman said he believed it had been decided in a tea case that the purchaser was entitled to have what he asked for, and that if the vendor could not supply him, he had a right to be told so.

Mr. Lacey quoted from Stone's 'Justices' Manual' the opinion of the editor that the words "to the prejudice of the purchaser" were intended to prevent injury to the person or pocket of the purchaser, and not to stop the production and sale of articles of various qualities and prices. The words were very ambiguous, and it might be contended that they would include the case of a mere mistake of selling one thing for another, if the purchaser could not use the thing bought for the purpose or to the extent which might have been possible if he had obtained exactly what he asked for, but Mr. Stone considered that they must be limited to the case of a seller knowing what it was that the purchaser actually demanded, and knowing what was the description he handed over. He (Mr. Lacey) contended that the statute was not aimed at such a case as this. The sale was clearly not "to the prejudice of the purchaser."

The Chairman said it was argued in the gin case that the purchaser was not prejudiced by having 27 per cent. of water mixed with the gin, as the weaker the dilution the less harm it would do him, but the bench ruled that the purchaser was entitled to have what he asked for.

Mr. Lacey said this case was different. There was no castor-oil at all in the pills.

The Chairman: This is the case of a purchaser asking for one thing and getting another.

Mr. Lacey: Which was better than the thing he asked for. He might state that his own opinion was fortified by that of a very eminent counsel, Mr. Charles, who went this circuit.

The Chairman said they had a great respect for Mr. Charles's opinion, but Mr. Lacey knew very well that the value of an opinion depended very much on the case submitted.

Mr. Lacey said he was perfectly willing for the bench to read his case. He intended to call before them several chemists who held a high position in their profession to prove the custom with reference to castor-oil pills. There were many articles sold by chemists which were called by names not properly applicable to them, and if the bench convicted in this case—

The Chairman: You would have to call a spade a spade.

Mr. Lacey was about to show that chemists sold many articles popularly called by names which were not properly applicable to them, when

The Chairman humorously suggested that Mr. Lacey should not go into this question, as he did not think chemists would thank him to disclose all the secrets of the trade.

Mr. Lacey, however, went on to say that there was, for instance, "sweet spirits of nitre," which contained no nitre. There were several other articles known by certain names not strictly applicable to them, and it was clearly not an offence to sell them under such names. Mr. Lacey then called

The defendant, Mr. Duncan, who was examined as a witness on his own behalf. He deposed:—Some little time ago I opened a branch establishment in Lansdowne Crescent. My assistant there is Michael Mason, who is registered by examination. The two shops are nearly a mile apart, and I am very seldom at the one in Lansdowne Crescent. The pills in question are a compound of rhubarb, aloes, myrrh, soap, peppermint, and treacle, and are the mildest aperient mentioned in the pharmacopœia, and safe for the most delicate constitution. I have heard of these pills being sold as castor-oil pills, and I believe that people know them as such. I myself have never sold them under that name, but I know that it is the custom to do so. Pills made of castor-oil would be dangerous if relied upon for the ordinary action of castor-oil, as an ordinary dose would have no effect. A serviceable dose would be two tablespoonsful or 600 pills.

The Chairman: Under what name were you in the habit of selling these particular pills?

Mr. Duncan: As compound rhubarb pills. I believe it has been the custom for many years to sell them as castor-oil pills.

Mr. Lacey: Do you know of any other misnomers in the drug business?

The Chairman: You are asking your witness to incriminate his own profession, which is hardly fair.

Mr. Lacey: Sweet spirits of nitre, for instance. Is there any nitre in that?

Mr. Duncan: No.

The Chairman: Now, you see, Mr. Lacey, I shall buy no more spirits of nitre.

Mr Lacey: Spirits of hartshorn?

Mr. Duncan: There is no hartshorn in that.

The Chairman: If you make these disclosures, I shall lose my faith in the entire Pharmacopœia.

Mr. Lacey: Cold cream. Is there any cream in that?

Mr. Duncan: None.

Mr. Lacey: You see, your worships, these names are given first by the people themselves, and then by the chemists, because they fancy there is some resemblance.

The Chairman: Because they draw.

Mr. Lacey: All these names are well understood to be misnomers?

Mr. Duncan: Yes.

The Chairman: Shall I take down that the public well understand that they do not get what they ask for?

The next witness was Mr. Green, chemist, of Christchurch, who said he had been in the habit for 25 or 30 years of selling a mild aperient—generally compound rhubarb pills—as castor-oil pills, by which name people asked for them. He had done this in four or five counties in which he had lived. The action of compound rhubarb pills was similar to that of castor-oil pills, but not quite so quick.

The Chairman: Do they not act on a different part?

Witness: Yes. They act on the rectum and bladder. They do not affect the same intestine. Two tablespoonfuls of castor-oil would act more quickly.

Mr. Lacey: How came these pills to be so named?

Witness: I believe it was in consequence of some proprietor of patent medicine bringing out pills under the name of castor-oil pills. Gradually the public came to ask for them in small quantities, and it has been the custom in all parts of England to sell under that name such pills as those supplied in this case.

Mr. Lacey: You have heard the description of the pills in the certificate. Are those more expensive than pills made of castor-oil would be?

Witness: Decidedly so. It might be possible to get one drop of castor-oil into a pill, but such pills would not be of the slightest use unless one took at least 200 or 300.

Mr. Lacey: I believe there are similar instances of misnomers in the trade. Vinegar-with-four-thieves, for instance, does not really contain thieves?

Witness: It does not.

Mr. Lacey: Epsom salts. Are those made at Epsom?

Witness: No; in the North of England.

Mr. Lacey: Violet powder. Are there any violets in that?

Witness: Not the least.

Mr. Lacey: I apprehend that no one seriously thinks he is buying these things when he asks for them?

The Chairman: Possibly not, but it is difficult to limit woman's faith.

Mr. Lacey: And from a pecuniary point of view, these compound rhubarb pills would be very much more expensive than castor-oil pills. My client has not acted from any mercenary motive. It is simply the case of the public having asked for one thing which has practically no existence and being supplied with the nearest we can give them.

The Chairman: They think they have what they ask for, and they go away with a contented mind.

Mr. Lacey: Yes, when it is impossible for them to get what they ask for—devil's dung, for instance.

Mr. Lacey: Dragon's blood. Is that procured from the dragon?

Witness: No.

Mr. Robert Chipperfield, chemist and druggist, o Southampton, deposed: I am a member of the Pharmaceutical Society, and have practised for some years. I have been in business for thirty years in London and Southampton. I have heard of castor-oil pills. A very mild aperient is sold under that name, but I scarcely apprehend that anyone out of a lunatic asylum really supposes that they are made of castor-oil. Such pills as those described in this case have been known as castor-oil pills for a quarter of a century to my knowledge. The action is that of a very mild aperient, and I can state positively from my own knowledge than those who purchase them know that they are not made from castor-oil, but are compounded in order to save the necessity of taking castor-oil. We sell butter of antimony, but there is no butter in it. There are many other instances of misleading names given to articles by the public, and I do not know that we are bound, even if we had the time, to educate everyone who comes to our shops and tell him the composition of these articles.

The Chairman: You had better leave the argument to the solicitor and tell us the fact.

Witness: That is the fact.

Mr. Lacey: Which would cost the most, these castor-oil pills or compound rhubarb pills?

Witness explained that if a person required sufficient pills really made of castor-oil for a dose, he would have to take 438, as only one drop can be got in a pill. There was no harm in these pills. The active ingredient was rhubarb. Spirits of nitre, he might observe, had just been mentioned. It had been known for 200 years by that name, but the proper name was spirits of nitrous ether. In this case no blame could be attached to the vendor, even if the public did not know the composition of the pills.

The Chairman: How should the public know if you do not tell them?

In delivering the decision of the Bench, the Chairman said the evidence which had been given for the defence did not touch the fact that Mr. White had asked for one thing and been served with another, but the evidence adduced had shown the existence of a custom in the trade which they admitted as evidence in mitigation. It was a singular custom, however, and the sooner it was left off the better. It would be much better when the public asked for castor-oil pills to tell them, "There are no such pills in the trade, but we can give you something which will answer the purpose as well." At all events the intention of the Act was perfectly clear—to give the public a right to have what they ask for or be told that they could not get it. The penalty they should inflict was a very light one, because they thought it quite probable that the chemist in this case acted in good faith and was not aware of the law as it existed. They fined the defendant 1*s.* and 19*s.* 6*d.* costs. — *Bournemouth Observer.*

Poisoning by Corrosive Sublimate.

An inquiry has been held at Woodford, Wilts, into the circumstances attending the death of Florence Thorn, one year and seven months old, the daughter of a shepherd. The evidence of Professor Redwood, who had made an examination of the stomach and its contents, proved the presence of corrosive sublimate.

John Thorn said he was brother of the deceased; he was thirteen years of age, and was a shepherd boy. About a month before the child died, his father gave him some stone mercury for the purpose of destroying maggots in the sheep. The piece given him was about the size of a small marble. Witness only used it once before he lost it. He believed he lost it at home before he went on the down. He looked about for it, but could not find it, and told his father he had lost it. He did not find it till his sister Elizabeth picked it up and gave it to him on the same Sunday his sister Floe died. He came home about six o'clock, and when his sister gave it to him and told him it was picked up in the garden, she asked him what it was, and he told her it was stone mercury. It appeared to be the same quantity that he had lost. He kept one piece and gave the two other pieces to Mr. Long's boy. He did not tell the latter that it was sweets, but that it was "stone mercury." No one said it was sweets, and no one tasted it at all.

A sister of the deceased deposed that she remembered one of the children bringing into the house something like a piece of soda, about the size of a small marble, which she dropped down in the house. It was of a light colour, and in falling it broke into several pieces. She (the witness) had never seen such stuff before till the previous day, when she found it near the gate in front of the house, and picked it up, thinking it was a marble, but put it down again. Her sister brought it into the house and let it drop out of her hand on to the floor and broke it. Witness picked up all the pieces she could see, and rolling them up in a piece of rag, kept them till her brother John came home, when she gave them to him. She did not see Florence pick up any. She did not sweep the house afterwards. She thought her brother John had told her some time before that he had lost some "stone mercury." On giving him the pieces she asked him what it was, and he told her it was "stone mercury." She believed when she gave the pieces to him that he put them into his pocket.

The jury, at the inquest, returned an open verdict. Subsequently the father of the deceased and a sister were charged with administering the poison, but the magistrates after hearing the above evidence discharged them, saying their was nothing to inculpate them.—From the *Salisbury and Winchester Journal.*

Suicide by Laudanum—A Coroner's Ignorance of the Law.

On Thursday August 2, an inquest was held at Walsall, before A. A. Fletcher, Esq., Coroner for the Borough, touching the death of a man named Baldwin, who had died after taking a quantity of laudanum. In the course of the proceedings:—

Mr. George Elliott, 50, Park Street, Walsall, was examined, and said: I am a member of the Pharmaceutical Society and a registered druggist. I remember the deceased calling at my shop on Tuesday, about twenty minutes to 9 p.m. He asked for one ounce of laudanum. I supplied him myself. I did not know him. He was a stranger to me. I did not ask his name. It was not necessary for me to do so. He was not introduced to me by any one. I did not ask him for what purpose he wanted it, but I asked him if he knew it was poison, and he replied "Yes." I then asked him if it was for someone who was used to taking it. He said it was for a woman who was in the habit of taking it to make her sleep. I did not inquire his address. I did not know where he lived. The laudanum was put into a one-ounce phial, and labelled in large letters, "Laudanum—Poison," and my name and address were upon the label. I sold deceased one ounce. The witness added that he was not required to ask a customer his name and address.

The Coroner: I think the law requires the name and address of the purchaser to be ascertained.

Witness: I think not. I have the Act here.

The Coroner: What Act is that?

Witness: It is the Act of 1868. [Here Mr. Elliott produced an extract from the Act].

The Coroner said the Act of 1877 was very different.

By Mr. Power (foreman of the jury): Deceased had no appearance of insanity when in my shop.

By the Coroner: I had not seen the deceased in my shop before.

The Coroner: I think it would be the wiser plan to question strangers, and ascertain the name and address of the purchaser. In fact, you cannot sell the poison without someone introducing the purchaser in cases where the purchaser is a stranger.

After hearing other evidence, the jury returned a verdict of *felo de se.*—From the *Walsall Observer.*

Obituary.

We regret to announce the death of Mr. John Huskisson, of Swinton Street, Gray's Inn Road. In a future number we hope to be able to give some account of his labours in connection with manufacturing chemistry.

Notice has also been received of the death of the following:—

On the 21st of July, 1877, Mr. William Agnew Martel, Chemist and Druggist, Great Yarmouth. Aged 37 years.

On the 26th of July, 1877, Mr. Walter Clarke, Chemist and Druggist, Commercial Road, E. Aged 42 years. Mr. Clarke had been a Member of the Pharmaceutical Society since 1870.

AUGUST HUSEMANN.

In a recent number of this Journal the death of this well-known pharmacologist was announced. We are indebted for the following information respecting his life and work to the *Pharmaceutische Zeitung.*

Professor August Husemann, Ph.D., was born on the 5th of September, 1833, at Stolzenau on the Weser. During the years 1848 to 1852 he learned pharmacy in the *Hofapotheke* at Detmold. He studied at Göttingen, whither he returned after brilliantly passing the Hanoverian state examination, in order to devote himself entirely to chemistry. In 1860, in consideration of an investigation of carotin and hydrocarotin, the degree of Doctor of Philosophy was conferred upon him. For some time afterwards he acted as assistant in the physiological chemistry laboratory, and in 1862 he became Private Teacher of Chemistry. To this period of his residence at Göttingen, besides his studies upon glycol compounds, which led him to the discovery of several new bodies, belongs his first considerable literary work, which made him known to a wider circle; this was the elaboration of the judicial information in the 'Handbook of Toxicology' which he issued in association with his relative, Dr. T. Husemann. During this time he also discovered various vegetable principles, as for instance, lycin in *Lycium barbarum* (the identity of which with betain he subsequently demonstrated), cytisin and helleborine. Delicate from his youth, and subject to frequent attacks of asthma, a severer illness than usual compelled him in August, 1863, to seek health through a winter residence in Italy. Even there, however, he was not inactive, as a large portion of his share in the supplementary volume to Gmelin's great work owed its origin to his residence in Pisa. Invigorated, though not cured, he returned from Italy, accepted an invitation to fill the post of Professor of Chemistry and Physics in the Cantonal School at Coire, and remained in that position until the year 1876, notwithstanding repeated offers from other educational establishments. Last year, however, in consequence of continually increasing sufferings that frequently laid him on a sick bed, he resigned his office, the faithful and zealous performance of the duties of which had been repeatedly acknowledged by the Academy authorities. The more important works composed during this period of his stay at Coire are his well-known 'Die Pflanzenstoffe—again in conjunction with Dr. T. Husemann—and a Manual of Chemistry that has been introduced into many upper schools, and reached a second edition in 1876. A small work on Agricultural Chemistry also belongs to this period. During many years, too, he contributed to Wigger's 'Jahresbericht für Pharmacie.' Amongst his smaller memoirs may be mentioned a number of careful analyses of the more important mineral springs of the Canton. After the resignation of his office, Dr. Husemann spent last winter in Meeran, from whence he returned to Switzerland, so far improved in health as to meditate undertaking another extensive literary work. A violent cold however, which he caught whilst travelling, again laid him upon the bed of sickness and ended his active and useful life on the 17th of last month.

Review.

ANTHRACENE, ITS CONSTITUTION, PROPERTIES, MANUFACTURE, AND DERIVATIVES, including Artificial Alizarin, Anthrapurpurin, etc., with their applications in dyeing and printing. By G. AUERBACH. Translated and Edited by WILLIAM CROOKES, F.R.S., etc. London: Longmans and Co. 1877.

Mr. G. Auerbach's monograph, according to the editor of the English edition, is generally recognized by "manufacturers and by scientific theorists as the authority on this interesting and important section of organic chemistry;" and in justice to the work it may be said to be well entitled to this praise.

The book, which numbers 245 pages, is not illustrated, otherwise it is as complete as can well be, except that its index is somewhat brief; the chapter of contents is however more complete; as for the translation, in our opinion, it might be better.

Mr. Auerbach commences with the history of anthracene, and in connection with this subject the researches of Dumas, Laurent, Fritzsche, Berthelot, Anderson, Limpricht, Graebe and Liebermann are summarized. Then follows a digest of researches bearing upon the constitution of anthracene and its derivatives, and this quasi-philosophical part of the book appears to us as the weakest section, and more particularly illustrates the fact that chemical science is, properly speaking, without a theory. Chemical constitution as at present understood, is the non-entity of an entity; we can scarcely appreciate its meaning, but if it has a meaning at all, that meaning must be relative in so far that the constitution of a chemical individual stands in relation to that of other bodies, influenced in its production and by its reactions. Thus it is seen that all the views of the constitution of anthracene explained by Mr. Auerbach are based upon Kekulé's theory of aromatic compounds—a theory which is entirely gratuitous, and one which, although it has led to much good work and this to some brilliant results, yet remains without an actual proof.

Graebe and Liebermann first expressed the opinion that anthracene was formed of three benzene rings like as naphthalin is supposed to be formed of two rings.

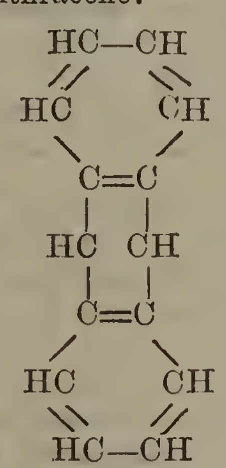
Anthracene and dibenzyl resulting as the main products of the action of water upon benzylchloride (C_6H_5 (CH_2Cl)) in sealed tubes at 180° it might be inferred that anthracene is diphenylacetylen. Thus

$$2\,C_6H_5(CH_2Cl) = (C_6H_5)C{\equiv}C(C_6H_5) + 2\,HCl + 2\,H.$$

But the derivation of alizarin from anthracene was regarded by Graebe and Liebermann as antagonistic to the above view, because alizarin yields phthalic acid on oxidation, while derivatives of dephenylacetylen must yield benzoic or substituted benzoic acids.

This judgment received corroboration from the almost simultaneous production of tolen or true dephenylacetylen by Limpricht and Schwanert, and since then anthraquinone has been regarded not as a true quinone but as a double ketone, inasmuch as anthracene yields it with soda lime.

Nevertheless, any one formula for anthracene is associated with so much assumption that we are left without any exact knowledge as to its true constitution. Thus the formula given below and adopted by most chemists, assumes that each methyl group is united by one bond with the benzene ring of the other benzylchloride, while Berthelot's synthesis of anthracene from styrol and benzol may be equally well explained by several other views of the constitution of anthracene.



It is both interesting and perhaps profitable that some chemists should devote themselves to such considerations, but it is seen that these never result in much real knowledge, and in our opinion they lead to views which are tenable only so long as they are used first to explain facts and to help to lead to new results; in themselves they are without meaning.

Kekulé's theory becomes still more unmeaning when it is seen that between the so-called aromatic series, and the fatty series of bodies there is no virtual diagnosis to be effected, and at the best it can be exercised only in an extremely narrow sphere of chemical science. Take for instance the partial transformation of acetylene (C_2H_2) into benzene (C_6H_6) by passage through a red-hot tube. It is seen that this is to some extent a reaction not unlike to the condensation of oxygen into ozone, and the fact of the condensation is quite as instructive as any hypothetical reasonings in connection with the specific manner and position in which the particular atoms of carbon and hydrogen are united. All that we understand of the reaction is expressed by the fact, and although chemists may derive some help in their personal labours from such hypothetical reasonings as are here alluded to, they cannot be said to increase our real knowledge. In these days, however, it might be deemed a mistake on the part of Mr. Auerbach or any other writer to omit such considerations in their writings.

From the constitution of anthracene, our author proceeds to describe the physical properties and preparation of this substance. The manufacture from coal tar is well described and betrays an intimate acquaintance on the part of the author with the various details of the process employed.

The several methods of valuation of crude anthracene are then discussed; Luck's process being the one of course, which receives the greatest recommendation. The multitudinous derivatives and compounds of anthracene are afterwards described one by one, and in time, alizarin and the many discoveries made of late years in regard to this tinctorial principle, its artificial synthesis and commercial fabrication, receive full attention. In relation to this part of the subject, the madder plant and its chemistry, and the most important derivatives of alizarin are also studied.

In short, as stated in the editor's preface, the work presents us with a summary of all important researches regarding anthracene and alizarin, and the industries which exist in connection with them and more or less allied substances.

To review such a work in detail would be interesting, but would occupy more time and space than can be devoted to it.

At the end of the book Mr. Auerbach gives a very complete bibliographical appendix, which must prove of great value to chemists who are occupied with work treated of in this volume. In recommending the book very strongly, it may be pointed out that chemical literature of the future will be probably far more special than it has been in the past. This is not only probable but recommendable in view of the vast ground covered by the various branches of chemical science, and as the science will become more and more special in certain directions, so also must its followers become more and more specialists, if they would materially extend the boundary lines of their science or profession.

Fownes' Manual of Chemistry, Theoretical and Practical. Vol I. Physical and Inorganic Chemistry. Twelfth edition. Revised and corrected by Henry Watts, B.A., F.R.S. London: J. and A. Churchill. 1877.

Fownes' 'Manual of Chemistry' is now so well known to the English scientific public that the appearance so lately of a twelfth edition cannot but elicit a renewed congratulation of its able editor and publishers. Perhaps the student is most to be congratulated on the possession of a valuable treatise. There are indeed few manuals of its class that can compete with it in its completeness of matter or its perspicuity of explanation.

But although the book is one of the best of its kind it does not represent the *ne plus ultra* of introductory works. That perfection has not yet been attained. Where indeed is the manual of chemistry which alone is sufficient to lead the student step by step from absolute ignorance to a clear perception of his science, not imparting too much nor too little, connecting dry facts by an interesting chain of generalizations, a book which shall take a place in scientific literature comparable to that of Herschel's 'Elements of Astronomy,' or Lyell's 'Elements of Geology'?

A special feature of this new edition of Fownes' manual is that it is in two volumes in place of the single bulky volume of former editions. The volume to which we draw special attention includes 'Chemical Physics' and 'Inorganic Chemistry.' The second part of the work, which is to include the latest advances of organic chemistry, is yet in course of publication.

It is somewhat puzzling to find that out of eighty pages devoted to chemical physics only half a page is deemed sufficient to instruct the student in thermo-electricity. On the other hand it must be allowed that what is taught in this section of the book is taught well, and it is difficult enough to draw the line in elementary works between diffuseness and completeness. We find, for instance, gallium occupying a place of honour on p. 434, although this metal has only been discovered two years, and its atomic weight is still in some obscurity. The chapters on so-called chemical philosophy are well done. It is curious to note here how chemists cling to the ancient term of chemical affinity with a persistency best illustrated, perhaps, by the term itself. Thus we find on p. 278, "The term chemical affinity or chemical attraction is used to describe that force," etc. Yet it might be pointed out that the term affinity is altogether a misleading and ill-applied term, for the student has to learn that those substances which have the least affinity or relation one to the other as regards their properties have on the contrary the greatest attraction for one another chemically.

But these and other shortcomings are not fatal ones, for by manuals alone the student cannot enter the domain of chemical science. Before any larger chemical treatise can be any good to him, or before he can select from the mass of original publications which inundate our libraries, he must by practical observation and judicious reflection choose his own path and make his individual compromise with the opportunities of instruction which are afforded to him. It has been well said by a great chemist that the study of chemistry may be compared to a journey of exploration; we must, like the traveller, never lose sight of the main track, though we may by choice wander away from it to return again, and thus, at times proceeding straight ahead, at others selecting a circuitous route, we obtain a comprehensive idea of the general features of the country through which we have passed. In the same metaphorical sense we may compare a manual like Fownes' 'Manual of Chemistry' to the trusty guide-book which, while neglecting no important information, leaves much to the individual powers of observation of its numerous readers.

Jahresbericht uber die Fortschritte der Pharmacognosie, Pharmacie und Toxicologie herausgegeben von Dr. G. Dragendorff. 10 Jahrgang, 1875. Gottingen: Vandenhoeck und Ruprecht. 1876. From the Publishers.

Jahresbericht uber die Fortschritte der Chemie und verwandter Theile anderer Wissenschaften. Herausgegeben von F. Fittica. Fur 1875. Dritter Heft. Giessen: J. Ricker. 1877. From the Editors.

Dispensing Memoranda.

We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be conidered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.

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[10]. Ext. Tarax. Liquid.—Respecting this question I see Mr. J. B. Barnes advocates the use of a preparation made by adding water to solid extract of taraxacum, and adds that that preparation was used on such occasions in a large dispensing establishment. I think this question, before being allowed to drop, would be better for a little

more ventilation. In one large house of business, I am informed, succus taraxaci is generally used. In the business in which I have myself been engaged (including two large West-end establishments) the liquor has always been used. Which can be considered correct? The liquefied extract, spoken of by Mr. Barnes, had its origin in an obsolete Prussian Pharmacopœia, and, from what he says, seems still in use in some businesses. I myself have not met with it, and did not know such a preparation was in use until I saw it in this Journal. The liquor, prepared, in common with many other liquors (or liquid extracts), from the dry roots, either by infusion or percolation with water, evaporating the solution *in vacuo* or otherwise, and preserving by the addition of spirit, is generally of such a strength that one part by measure represents one part by weight of the root. This "liquor" seems established as a pharmaceutical preparation and is much preferred by many prescribers. If then a "liquor" be admitted in dispensing, why not use it when liquid extract (in vegetable preparations of this class, I believe "liquor" and "liquid extract" are synonymous terms) is ordered? It is a rule observed with many other preparations of a similar nature, and I also think it is carried out in this particular instance in the majority of businesses where dispensing is a reality. There is this objection to its absolute correctness, viz., that there is no pharmacopœial authority for its preparation; it thus becomes by no means certain but that those who argue in favour of the succus may be the most correct, for a liquid preparation being intended, and the succus being the nearest approximation in the present Pharmacopœia, it would be preferable to use that rather than other preparations, having no such authority, and sometimes varying in strength. If the fact of what is most commonly used determines that which is right, my own experience and what I can ascertain, shows that liquor is generally used when ext. tarax. liq. is prescribed.

E. M.

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[16]. How should the following prescription be dispensed?—M.

℞ Quinæ Sulph. . . . gr. vj.
Ferri Sulph. Sic. . . gr. xij.
Aloes Barb. . . . . ℈ij.
Pulv. Capsici . . . . q.s.
Et divide in pil. xij.
One to be taken at night.

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[17]. A PILL QUERY.—Can any of your readers inform me how to make the following prescription into a good mass from which the ol. carui will not separate nor become crumbly when made into pills?

℞ Pil. Plummer . . . . ʒj.
(Pil. Hyd. Subchlor. Co.)
Ext. Hyoscyam.
Ext. Colocynth. Co.
Pil. Rhei Comp. āā . . ʒj.
Ol. Carui . . . . . gtt. 24.
M. ft. Mas. et div. in Pil. gr. iv. āā.

AN APPRENTICE.

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[18]. A PILL QUERY.—Can any reader inform me of the best mode of preserving Pure Ox-Gall Pills from falling after being made a day or two? I have tried the tolu process, silvering and putting into stoppered bottles, also packing in cotton wool, all of which gave unsatisfactory results.—X.Y.Z.

Notes and Queries.

[552]. COLOURING FOR MIXTURES.—Can any reader give an idea of the composition of an article which is supplied by a London house, chiefly to surgeons, for colouring mixtures. It is labelled "Liq. Rosæ Comp," and is compatable with acids and alkalies? C.

Correspondence.

COUNTER PRACTICE.

Sir,—Those members of the Council, who on the 1st inst. constituted a minority of four, when voting on the question of "counter practice," apparently feel little sympathy for those whose interests the said question vitally affects. If the want of sympathy be real, I am quite sure that it can only be accounted for by those gentlemen being in utter ignorance of the ruinous effect the prohibition of counter-prescribing would have on *a very large majority* of druggists throughout the kingdom, and of the extreme injury it would inflict on a large portion of the poorer part of the population. I would ask those gentlemen to consider what their position would be if they were suddenly to be deprived of the right of dispensing medical prescriptions. Their several businesses would simply be wiped out or washed away. It would be ruin to the "upper ten" of the trade (many of whom, by the way, would doubtless be able to survive the cataclysm), but the greater bulk of their brethren would be quite unaffected by such deprivation, inasmuch as they have not the pleasure to dispense a prescription once in a week. The equivalent that would affect them, would be to deprive them of their right of dispensing—deprive them of it, and *their* "occupation would be gone;" and *they*, in a pecuniary sense, would *not* "be able to survive it." A speaker at the meeting in question said "those who so acted (*i.e.* prescribed) reaped the benefit, the Society did not." I contend that the Society "does (indirectly) reap the benefit." The guineas of those who subscribe to the Society's funds, and are enabled to do so, by prescribing, far outnumber the guineas of those, who subscribing are enabled to do so by dispensing.

In reply to the President's observation that "chemists and druggists had no (medical) education, properly so called." I would like to ask him "if he would be surprised to hear" that applications to druggists in country places by the poorer classes to prescribe for them, after having derived no benefit from the customary *two pills* of their club doctor are very numerous? They certainly would not be so numerous did not experience teach the applicants that the febrifuge or quinine mixture (for club-patients, quinine is like angels' visits in its infrequency), or what not, was worth the 1*s*. or 1*s*. 6*d*. they invested in it. Is the President unaware, that great numbers of druggists in business have gained a considerable amount of experience with surgeons in private practice, and at dispensaries, infirmaries, and hospitals? And does he not think that they must be dunderheads indeed, if under such circumstances they have obtained "no education properly so called" to fit them to prescribe across the counter for cases of simple ailments? And now a word for the public, for it is a question that affects a large portion of them quite as much as it affects the major portion of the druggists.

With regard to medical advice, the public may be said to be divided into three classes. The first class constitute Society's upper crust, who, when ailing send for their physician, pay him his guinea, and get a prescription made up by one of the "upper ten" of the trade (who are well represented on the Council) at a cost perhaps of from 1*s*. 6*d*. to 3*s*. 6*d*. or more. The second class, unable to indulge in (to them) so great a luxury, in place of the guinea physician, call in a general practitioner, who, in nine cases out of ten supplies medicine as well as advice at a price *per diem*, varying possibly from 7*s*. 6*d*. to 2*s*. 6*d*., the charge depending partly on the "standing" of the general practitioner and his opinion of the depth of his patient's purse; his diagnosis in this respect—whatever it may be in others—not always being infallible. But half-a-crown may be taken as the *minimum* charge entailed by seeking his advice. The third class, quite unable to indulge in any of these (to them) luxuries, having perhaps 6*d*. or possibly at most 1*s*. to invest, seek relief for their every day ailments of some intelligent druggist, and to tens of thousands of the poorer classes such men are an almost invaluable boon. The poor cannot, as I have said, when *thus* ailing afford to pay the charges of a medical man, it is almost more than they can compass in cases of serious sickness. What would "the minority of four" recommend such to do in place of applying to a druggist? Anything like "Wade's Act," which met with such scathing sarcasm in your Journal of 31st June, at the hands of "Yecapnhoj" (which being richly merited, was pleasant to peruse), would be an unmitigated curse to them.

ROBT. CHIPPERFIELD.

Southampton, 6th August, 1877.

The Verb "Dispense."

Sir,—In the Apothecaries' Act, the right of chemists and Druggists to dispense medicines is unlimited by any restriction, such as the preparing of physicians' prescriptions. Dispense ought therefore to carry the same force that it has in ecclesiastical law, or even in ordinary conversation.

Thus we say that the sun dispenses heat and light—a most apt use of the term analogous in its application to our own position and rights; being at once stationary, dative, and distributive.

This verb invests its nominative either with power, or with authoritative volition, according as that nominative is personal or impersonal; moreover, it is used to denote that supremacy, which gives or suspends law.

For my own part, I believe the verb dispense implies that our position is a stationary one; viz., that we should *stay* in our shops and not visit; but whether this be so or not, I do not think we are called upon to draw boundary lines, because the Act does not.

If the Act is imperfect, or inconsistent with itself, that is no reason why the meaning of words which reserve and secure our rights should be pared and whittled and twisted to suit the fancied interests of the Apothecaries' Company.

And further, considering the knowledge which our constant familiarity with drugs and medicines gives, and the multiplication of books on all branches of medical science, it is, in the public interest, most desirable that Chemists and Druggists should not be interfered with; otherwise people will "doctor" their small ailments themselves. The instinct of self preservation is quite sufficient to send sufferers to highly trained practitioners, when their ailments are serious enough to warrant the expense; and the few exceptions which occur to the contrary, may safely be considered to confirm the soundness of this view.

York, August 6, 1877. J. W.

Pharmacy in the Isle of Man.

Sir,—Nine years ago, the British Parliament deemed it "expedient for the safety of the public" to pass a law requiring "persons known as chemists and druggists" to demonstrate their competence by passing two examinations before opening "a shop for the retailing, dispensing, or compounding of poisons." That Act has been found to work very satisfactorily; so satisfactorily indeed that it would be difficult to find a hundred intelligent, uninterested persons in the kingdom who would vote for its repeal.

Since the passing of the Pharmacy Act in 1868, laws of a similar character have been introduced into some parts of the United States, the Canadian Dominion, and our distant Australian Colonies. Yet, while countries thousands of miles away have been following Great Britain in the path of progress, the Isle of Man—within five hours' sail from England, Ireland, or Scotland—has earned the rather doubtful credit of having maintained a stationary position. The Isle of Man, abreast of England as regards education and civil and religious liberty, remains behind Turkey in pharmaceutical legislature, since she possesses no pharmacy law whatever. Nay, what makes this legal omission most astonishing is the fact that, in some other respects, the Manx are in advance of their fellow-subjects, being free from both Income Tax and Poor Law, and having enjoyed—I believe, upwards of a quarter of a century—that which Ireland has, so far, asked in vain—Sunday closing.

The rising generation of Manx pharmacists, although not required to pass any examination, invariably present themselves before the London Board of Examiners; but should they commence business in the island—after spending time and money to qualify *pro bono publico*—they are liable to be opposed by any unexamined man who chooses to settle there. This is their grievance; and those who know the island will bear me out in saying that it is not an imaginary one.

If, however, the people of the Isle of Man have stood still while others have been moving in the right direction, it is mainly owing to an incomprehensible want of energy on the part of the Manx chemists themselves. One would naturally expect them to be seeking the requisite protection; but, like the Orientals, they have a decided weakness for taking things easy. They neither speak nor act. They view the situation with an "opiated indifference" that would fill the soul of a Turkish Pasha with envy and admiration.

It does not require an immense amount of exertion, however, to raise the Isle of Man, in this respect, to the level of other civilized communities. All that is needed is the extension of the English Pharmacy Act to the Island. The absence of such an Act from the insular Statute Book concerns visitors as well as inhabitants; and it is my firm conviction that if the matter were represented to the Lieutenant Governor—who has already conferred untold benefits on the island—the present anomalous state of things would be brought to a speedy termination. Further, I believe the House of Keys, instead of opposing, would facilitate the introduction of the Act, for the following reasons:

1st. Because they would be merely introducing a system which has been adopted by nearly every State in Europe.

2nd. Because the local press—representing the people—has more than once pointed out the necessity for immediate action.

3rd. Because the Pharmacy Act guarantees that none but educated and trained men shall dispense medicines for the sick.

4th. Because it does this without imposing an additional burden on the ratepayers.

Douglas, July 28, 1877. H. S. F.

Castor-Oil Pills.

Sir,—Last week at Christchurch Petty Sessions, a case was tried of selling Compound Rhubarb Pills, when "Castor-Oil Pills" were asked for. Mr. Angel—the public analyst—appended to his certificate of their composition, the following:—"The application of the term 'Castor-Oil' to their pills was a dangerous practice, and might be attended with injurious results by leading the purchaser to understand that the active ingredient was castor-oil." The chairman delivered the opinion of the bench in these words—viz. "The evidence which had been given for the defence did not touch the fact that Mr. White (the policeman) had asked for one thing and been served with another, but the evidence adduced had shown the existence of a custom in the trade which they admitted as evidence in mitigation. It was a singular custom, however, and the sooner it was left off the better. It would be much better when the public asked for castor-oil pills to tell them "there are no such pills in the trade, but we can give you something that will answer the purpose as well." At all events, the intention of the Act was perfectly clear—to give the public a right to have what they ask for, or be told that they could not get it. The penalty they should inflict was a very light one, because they thought it quite probable that the chemist in this case acted in good faith, and was not aware of the law as it existed, the defendant is fined 1*s*. and 19*s*. 6*d*. costs."

I do not venture to question the correctness of the decision—no doubt the letter of the Act was infringed, but there is as little doubt that the framers of the Act never intended its provisions to be thus used. But the question is where is this sort of thing to end—where the line of demarcation to be drawn. Will druggists be "liable to a penalty of £20" for selling "*Crabs Eyes*," "*Milk of Roses*," "*Cold Cream*," "*Blue Butter*," "*Violet Powder*," the popular names of which—with many other articles of every day sale—are as great misnomers as "Castor-Oil Pills." The provisions of the Act apply equally to preparations intended for external as for internal use.

Southampton. Robert Chipperfield.

C. E. Stuart.—(1) Linnæus; (2) We believe the fact is as you state, but think the important "feat" too far removed from the domain of pharmacy to need special record in these columns.

"*Bromo Paper*" and *W*. are referred to the rule respecting anonymous communications.

Mr. E. Jerrett is thanked for his communication.

J. Gildert.—The Act does not appear to be very definite on the point. You are recommended to put the question to the Inland Revenue authorities.

Communications, Letters, etc., have been received from Messrs. Fox, Watson, Large, White, Cock, Welborn, Fletcher, Stuart, Natura.

NOTE ON COSTUS.

BY PROFESSOR FLÜCKIGER.

Mr. Cooke's article on the above named root (*Pharm. Journ.*, July 21st. 1877, p. 41) gives a full and I think correct idea of this drug, which played so important a part from the remotest antiquity down to the end of the last or even the beginning of the present century. When we were at work for the 'Pharmacographia,' my late friend Daniel Hanbury and myself, in examining the costus-root, resolved to exclude it from our work, the drug not being used by English practitioners in India, nor having a place even in the Pharmacopœia of India, except among the non-officinal drugs.

Mr. Cooke mentioning but very briefly the microscopic structure of the root, I beg to say in addition to his statement, that the specimens before me agree well with Guibourt's figures in his 'Histoire naturelle des Drogues simples,' III. (1869), p. 33. I have already stated in my pamphlet 'Die Frankfurter Liste,' Halle, 1873, p. 25, that the tissue of the root abounds in *inulin* and shows, especially in the bark of the branches of the root, large *balsam-ducts.* In both these respects costus root agrees well with elecampane and other aromatic roots of Compositæ. The microscope, therefore, affords further evidence of the correctness of Falconer's suggestion, that costus is derived from *Aplotaxis*, at least in as much as inulin is not to be met with in any other natural orders than in Compositæ and a few allied orders, viz., Campanulaceæ, Goodeniaceæ and Stylideæ. Starch is usually wanting in these plants, and so I found none to occur in costus.

Externally costus-root likewise reminds of elecampane, although it is much more woody; curiously enough, Dioscorides already alluded to this fact, pointing out that elecampane from Northern Syria (Kommagene) might be substituted for costus. Long before the period of Dioscorides, costus was already mentioned as a spice by Theophrastus, about the end of the fourth or the beginning of the third century B.C. It also occurs in the offering made B.C. 243 by Seleucus II., king of Syria, and his brother Antiochus Hierax, to the temple of Apollo at Miletus (see 'Pharmacographia' 467). The royal gifts consisted chiefly of vessels of gold and silver, the weight of each being mentioned in the inscription on the walls of the temple; but it included besides ten talents of **λιβανωτον** (olibanum), one talent of **σμυρνη** (myrrh), two pounds of **κασια** (cassia), two pounds of **κινναμωμον** (cinnamon) and two pounds of **κοστος** (costus).

Costus again occurs among the commodities coming in the first century of our era from India by way of the Erythrean Sea, that is to say the gulf of Aden and the Red Sea, for it is mentioned, together with the spices just alluded to, in the famous Periplus of the Erythrean Sea, as published by Dr. Vincent, Dean of Westminster (see 'Pharmacographia,' 467).

There is also further evidence that costus was well known at an early period in continental Europe. In the diploma granted, A.D. 716, by Chilperic II., king of the Franks, to the monastery of Corbie (monasterio Corbeiensi), near Amiens ('Pharmacographia,' 488), mention is made of piper, cuminum, cariofili, amandoli, pasticiæ, olivæ, cinnamomum, spica (spikenard), *costus*, dactyli, and karigæ (figs).

A.D. 745 Gemmulus, diaconus at Rome, announced to St. Bonifacius, the German apostle, that he was to receive from the Roman synodus the following gifts "cum magna reverentia," viz., cinnamon four ounces, *costus* four ounces, pepper two pounds, cozumber one pound (Taffé, 'Bibl. rerum germanicarum' 1866, III., p. 156, 199, 218). This list evidently proves that costus was much valued then.

Costus is also met with in a curious receipt of the ninth century (Dümmler, 'Mittheilungen der antiquarischen Gesellschaft in Zürich,' xii., 1859, p. 139) showing what ingredients the monks of St. Gall in Switzerland then used for seasoning fish. The document says: "Capiantur pisces natura pingues, ut sunt salmones, anguillæ, alese, sardine vel haringe, et fit ex eis atque ex herbis odoratis aridis talis compositio. . . ." Among the spices *costus* is enumerated along with pepper, cinnamon, cloves.

In the 'Antiqua Statuta Abbatiæ S. Petri Corbeiensis,' the above mentioned monastery of Corbie, of the year 1322 ('Polyptique de l'abbé Irmino II.' 1844, p. 336 (see 'Pharmacographia,' 496), *costus* is met with together with galanga, rhubarb, and mastix.

Mr. Cooke has already pointed out that costus continues still in the East to form an important article of trade. It was so from time immemorial; the "*Sommario*" di tutte le regni, città e populi orientali, in Ramutio's Collection: 'Delle navigationi et viaggi,' Venezia, 1554, fol. 372, states costus to be largely imported, probably from Cashmir, in the Malayan Peninsula. Similar remarks may be found in Milburn, 'Oriental Commerce II.' (1813), 463, 482, and I., 290, and again in Aitchison's recent book 'On the Trade Products of Leh,' Calcutta, 1874. Aitchison notices the strong violet-like odour given off by the root and retained for a very long time by the sacks in which it is packed. In the fresh state the odour may be different from what it is in the dried drug, for the sample before me in this respect reminds rather of German chamomiles.

The chemistry of elecampane is far from having been satisfactorily investigated, but it has already afforded quite interesting information; it would be well worth while to submit likewise to chemical examination the costus-root—the elecampane of the East.

THE SPONGES OF COMMERCE.*

(*Concluded from page* 108.)

This distribution indicates the naturalness of the three species, and shows also that the dealers have to do with a vast variety of forms. They can, however, pick out the three species and their varieties without hesitation, and I was amused and interested at finding that the method pursued was precisely similar to that which I had been obliged to adopt in distinguishing empirically the various sub-species and species of Spongia. They are led mainly by the general aspect of the surface. This has a distinct appearance in every species, and though much altered by the greater or less development of superficial tufts, is much more constant than any other character. It is due to the fact that the surface takes its aspect largely from the number, distribution, and size of the pores, cloacal orifices, superficial canals and primary fibres. These characteristics, of course, are directly correllated with all that is important in the internal anatomy of the animal, and should therefore be more constant than the length, form, or composition of the tufts of fibres, or the shape of the whole, which are capable of great modification, according to the locality in

* From the *Journal of Applied Science*, August 1, 1877.

which the specimen may be found. The forms of *Spongia officinalis* may vary from cup-shape to fistular, and to irregular or lump-like. The latter are usually coarser and looser in texture, the superficial tufts are longer and more numerous, and they approximate more closely to the coarser varieties of sub-species *tubulifera* of the Caribbean Sea in the external aspect of the surface and the apertion of the interior than the finer varieties.

The texture of the poorest variety of the Mediterranean sponges is, however, always better for domestic purposes than the best of the corresponding American varieties, being firmer and more elastic; and it is also to be remarked that the last never have the cup-shape, which is so common in the sub-species *Mediterranea*, and that the fistular form takes its place. The forms of *Spongia agaricina*, sub species *Zimocca*, vary from saucer-shape to irregular, lump-like growth. As in the *Spongia officinalis*, it may be shown that these aberrant forms are quite similar to the aberrant or formless varieties of the sub-species *punctata* of Florida, as regards the aspect of the surface; but these also are nevertheless much finer than the finest varieties of the latter. Here, again, the platter or saucer-shape, which is a modification of the cup-shape, is absent. *Spongia equina* exhibits similar degrees of variation in the texture of the surface and the form. There are no proper cup-shaped specimens among the American varieties of sub-species *gossypina*, but in place of these the fistular form. These occur generally associated in clumps, more or less densely filled up into heads, and solid, but sometimes the tubes are almost isolated. The younger specimens of this species have a very loose and open texture, due to the approximation and large size of the openings, and to a less degree this is also to be remarked in the Gerbis sponge. The former approximate in aspect to the coarser qualities of the American species, and so also does the latter, which has very nearly the same colour and aspect as the dark-coloured Key West specimens, but is not so coarse or dark. It seems, then, that there are three sub-species of commercial value in the Mediterranean, and although there are more than three in the list of the American forms which follows, there are really only three, or at most four, sub-species which find their way into the New York and European markets. The coarsest varieties of the European sponges are finer, firmer, and more elastic than the finest of the corresponding American sub-species. This is directly traceable to the larger amount of foreign matter included in the primary threads, the looser mesh of the tissue; the fibres are also comparatively coarser and the large cloacal channels more numerous throughout the mass.

Thus the different varieties of sub-species *gossypina* differ in an exactly similar way from each other, and from the third form, sub-species *cerebriformis*; they differ in texture, in surface, and also in habitat, the finer kinds, as stated prevously, being found in the deeper water, equally removed from excessive heat and excessive sediment. These three sub-species run together by means of specimens of the coarser varieties, which cannot be distinguished from each other with any certainty, in the same manner as the corresponding sub-species in the Mediterranean and Caribbean Seas were connected, through the coarser, and not by the aid of the finer varieties. It is evident, however, that besides the general differences previously noted, that the cup-shape form is not found in the American sub-species, whereas it is the prevalent form of the Mediterranean sub-species. A cursory examination of a large collection will, however, satisfy any one that the shape does not necessarily correllate with a finer or a coarser skeleton, but probably with a more or less extended base of attachment and local peculiarities, such as currents, and the kind of bottom, etc., which have not been investigated in this connection.

THE MOTIONS OF THE LEAVES IN OXALIS.*

Of all the remarkable phenomena in the life of plants, perhaps the most singular is the so-called "Sleep of Plants." The object of these investigations was to discover the source of motion *in the leaves*, and for this purpose a species of oxalis was taken, when it was found that the source of the motions originates in the petioles or leaf-stalks, and not in the leaves. The plant chosen for these experiments was the *Oxalis acetosella*, or wood sorrel, the true shamrock of the Irish. This plant has trifoliate leaves, the separate folioles of which, at the approach of night, a storm, or during a high wind drop down until they lie parallel with the leafstalk; but under the influence of the sun's light and heat are again raised until the surfaces of the separate leaflets are even with one another, and at right angles with the petiole. It was found by means of paper caps, tubes, and similar apparatus placed over the leaflets, that they are not affected so long as the petiole remains uncovered; but, on the contrary, if the petioles are covered, the edges of the leaflets are deflected in a short time. These experiments may be imitated in a simple manner by placing a strong, healthy, growing plant in a window exposed to the sun and behind a common roller window blind, when by alternately raising and lowering the blind (allowing it to stop for a short time at the same spot) the effect of the sunlight on the leaves and petioles will be well seen; in this case, however, the effect was produced by blowing on the leaves with a pair of bellows; at three minutes before nine o'clock the leaflets were all closed; the plant was then shaded in some parts and exposed to the sun. The following is the time when fully open:—9.25, sunlight on petioles, but not leaflets; 9.30, sunlight on leaflets and petioles; so that it would seem almost as if the leaflets themselves, by their weight, rather retarded than accelerated their being open to full extent. This power of raising and deflecting the leaflets seems to rest in the liber cells of the petiole, and would almost seem to point out the presence in plants of fibres analogous to the muscles which move the legs and arms in animals; but is more probably due to the effects of moisture and elasticity. Nitric acid, liquid potash, and the ordinary reagents, when applied to the sutures of the leaflets, had no effect in deflecting the leaves other than by destroying the entire tissue in a short time.

REMOVAL OF STRONG ODOURS FROM THE HANDS AND FROM UTENSILS.

The *Schweizerische Wochenschrift für Pharmacie* (1877, 84) has a communication from F. Schneider, in which he states that ground mustard, mixed with a little water, is an excellent agent for cleansing the hands after handling disagreeably or strongly odorous substances, such as cod-liver oil, musk, valerianic acid and its salts. Scale-pans and vessels may also be readily freed from odour by the same method.

In a succeeding number of the some journal (p. 104), A. Huber states that all oily seeds, when powdered, answer for this purpose. Flax-seed meal, for instance, removes odours as well as mustard. The use of ground almond-cake as a detergent is well known. The explanation of this action is somewhat doubtful, but it is not improbable that the odorous bodies are dissolved by the fatty oil of the seed, and emulsionized by the contact with water. In the case of bitter almonds and mustard, the development of ethereal oil, under the influence of water, may perhaps be an additional help to destroy foreign odours. The author also mentions that the smell of carbolic acid may be removed by rubbing the hands with damp flax-seed meal, and that cod-liver oil bottles may be cleansed with a little hot sesame or olive oil.

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* From the *Leamington Spa Courier*.

The Pharmaceutical Journal.

SATURDAY, AUGUST 18, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

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THE BRITISH PHARMACEUTICAL CONFERENCE OF 1877.

ON Sunday, August 12th, a hundred men in perhaps a hundred places, were preparing for their visit to Plymouth, and during the whole of Monday the trains which arrived at that town brought thither numbers of visitors, some for the Conference, some for the British Association, and others for both. If anything were wanted to prove the general interest taken in pharmacy, both by pharmacists and some scientific chemists, it might perhaps have been found in the abandonment of pleasure by many who formed part of Tuesday and Wednesday meetings. There were present gentlemen from the far North, East, West and South, and even those who had been rambling during their annual holiday amid the wilds of Dartmoor and roving along the yet wilder and craggy coasts of Cornwall forsook those charming resorts for the sake of science.

By midnight on Monday small gatherings of visitors had assembled at all the chief hotels, and were to be seen seriously discussing the virtues of their tobacco and their glasses. And punctually at ten the next morning did the Conference summon its members to consider the report of the executive, and listen to the interesting address of the President, Professor REDWOOD.

This address, which will be found on another page, consisted of a timely *résumé* of the history of the steps by which "the druggist of to-day has been transformed into the apothecary of the seventeenth century." Recognizing the existence of circumstances liable to induce fears that in the attempt to raise the *status* of the practice of pharmacy substantial advantages may be lost, and only barren honour gained, the President sought in the history of the past a demonstration that the profit as well as the honour from such an occupation will mainly depend upon the qualifications of those following it to render valuable and efficient service to the public. In doing so he traced the rise of the barber surgeons and physicians, the origin of the apothecaries in the need of the physicians, and their subsequent antagonism to them, how a sense of the public requirements was too strong to allow of the restriction of the apothecaries to the mere dispensing of medicines, and how the apothecaries in their turn, having attained a higher position by virtue of their recognized utility to the public, became the assailants instead of the assailed. This led to the opposition of the chemists and druggists, organized in 1813, which left a mark upon the Apothecaries Act passed two years later, not without interest at the present time. Professor REDWOOD'S address was listened to with deep attention, and will no doubt be read with much interest by many who were not present to hear it.

The first paper was a Report read by Dr. WRIGHT, in the names of Mr. GROVES, Mr. WILLIAMS, and himself, who constituted a committee, appointed at the last meeting to continue investigations upon the aconite alkaloids. It was pointed out that in past reports the existence of two well defined alkaloids in *A. Napellus* had been established, viz., aconitine, $C_{33}H_{43}NO_{12}$, and picraconitine, $C_{31}H_{45}NO_{10}$, while from *Aconitum ferox* a third alkaloid had been isolated, expressed by the formula $C_{36}H_{49}NO_{11}$. The results which formed the chief features of the present communication illustrated the decompositions undergone by aconitine and pseudaconitine under influences resulting in the assimilation of water, for instance, treatment with dilute acids and alkalies. These decompositions Dr. WRIGHT expressed as follows:—

$$(1)\quad \underset{\text{Aconitine.}}{C_{33}H_{43}NO_{12}} + H_2O = \underset{\text{Benzoic Acid.}}{C_7H_6O_2} + \underset{\text{Aconine.}}{C_{26}H_{39}NO_{11}}$$

$$(2)\quad \underset{\text{Pseudaconitine.}}{C_{36}H_{49}NO_{11}} + H_2O = \underset{\text{Dimethylprotocatechuic acid.}}{C_9H_{10}O_4} + \underset{\text{Pseudaconine.}}{C_{27}H_{41}NO_8}$$

Among other matters treated of in this paper Dr. WRIGHT detailed a method for assaying the commercial aconite alkaloids, which he claimed to yield approximately accurate results.

In the next paper, Dr. PAUL and Mr. C. T. KINGZETT described the alkaloid of Japanese aconite, which was shown to be different from anything described by WRIGHT or other observers. A sample of the crystalline base was exhibited, the formula attributed to it being $C_{29}H_{43}NO_9$. The authors gave their reasons for believing that the various alkaloids which had been universally described and analysed as alkaloids of aconite were probably salts of the bases in combination with an acid perhaps aconitic. In the course of the discussion following the reading of these two papers Mr. KINGZETT criticized the analytical data submitted by Dr. WRIGHT in his various reports on this subject.

"The Active Principle of Cayenne Pepper" was the title of the third paper, by Mr. J. C. THRESH. The author reported that he had found free palmitic acid to be a natural and predominating constituent of cayenne pepper fat, and further described capsaicin or the active principle which is obtained in small amount from cayenne pepper, and which has a formula near to $C_6H_{14}O_2$. In the discussion which followed the imperfectly known physiological action of capsaicin formed the chief topic.

The next communication was by Dr. TILDEN "On the Essential Oils with special reference to the

Hydrocarbons contained in them." In it were described the results of a further study by the author of the action of nitrosyl (NOCl) upon various terpenes of the formula $C_{10}H_{16}$, and upon other substances of the composition $C_{15}H_{24}$. The terpenes give compounds which yield on suitable treatment substitution products expressed by the formula $C_{10}H_{15}$ (NO), while the hydrocarbons $C_{15}H_{24}$ fail to show this character.

These results agree with those of KINGZETT and WRIGHT, who each by pursuing different lines of research have arrived at similar conclusions regarding these classes of bodies. Whereas however these chemists believe that only one cymene, $C_{10}H_{14}$, exists, and may be got from all the terpenes, TILDEN believes that a number of isomeric cymenes exist, the only ground for this belief brought forward, being the differences exhibited by different specimens in their rotatory power over light.

In the next paper, by Messrs. M. M. P. MUIR and S. SUGIURA, essential oil of sage was further described; also the terpenes which they have obtained from it and their action upon light, and the composition of certain camphor-like bodies contained in the essential oil.

Following this paper was one by Mr. R. H. DAVIES upon "The Constituents of the Ivy," although virtually the only one treated of by the author was hederic acid, a substance isolated originally by POSSELT, and further described by HARTSENS. In analyses made of this substance Mr. DAVIES had experienced a difficulty in combustion, although as a matter of fact, it may be remarked that when heated on platinum foil alone, it burns away quite easily and entirely, leaving not a trace of charcoal. Mr. DAVIES arrived at a higher percentage of carbon for the substance than did POSSELT, whose analyses led to the formula $C_{15}H_{24}O_4$ while those of Mr. DAVIES give $C_{16}H_{26}O_4$. A nitro compound $C_{16}H_{25}(NO_2)O_4$ was also described, but attempts to prepare certain salts proved futile. This might have been expected of a substance having the character of a glucoside as predicted last year by Mr. KINGZETT, who now followed Mr. DAVIES with a note on Hederic Acid.

In this communication Mr. KINGZETT described the means whereby, following up his own suggestion as to the nature of this substance, he had isolated glucose from hederic acid, and had obtained a barium salt of the same, the analysis of which was described. Mr. KINGZETT explained that this research formed part of a broader investigation, the first part of which had been communicated to the Chemical Society recently by Dr. HAKE and himself, and he regarded the production of sugar from hederic acid as one proof of the correctness of his theory described in that paper.

Mr. J. ELIOT HOWARD was the author of the next paper "On the Supply of Cinchona Bark, as connected with the present price of Quinine." The discussion which ensued was perhaps as interesting as the paper itself, the points which were elicited being as follows:—Although it would be attended with some advantages to use other cinchona alkaloids than quinine for at least some purposes, yet the medical evidence available is far from satisfactory as regards the specific action of any of the other alkaloids except quinine. More satisfactory evidence of the kind must therefore be obtained before the commercial development of cinchonidine, etc., can be attempted on a large scale.

In his "Supplementary Note on the Assay of Opium," Mr. B. S. PROCTOR described certain improvements he had introduced into the method described at the last Conference meeting. In reference to this method it is questionable whether the extraction of opium by percolation satisfies the requirements of commercial analysis. It may also be pointed out that in washing morphia when separated from the other alkaloids, no fixed standard of the amount thus dissolved can be depended upon, varying as it does not only with other conditions but notably according to the influence of certain very soluble bodies in causing other bodies by themselves insoluble to pass into solution.

Mr. W. W. STODDART'S "Notes on an Impurity in Oxide of Zinc," were directed to the presence of sulphite of zinc, and in the discussion which followed various explanations were offered, the most plausible one being that the sample in question had been made by ignition of the sulphate which constitutes to some extent a waste product of the autogenous soldering process.

Dr. SYMES then read a paper on "Sugar in Pharmacy," in which he described the various sugars to be found in commerce, their degree of purity and impurity, their inversion by acids, and their general uses in pharmacy. In particular he showed that the syrups of saffron and roses could be readily prepared by making concentrated infusions and filtering upon granulated sugar contained in a hot water bath, with frequent stirrings till dry.

The meeting on Tuesday concluded with a paper by Mr. A. W. GERRARD, in which he described experiments leading him to the conclusion that *Narcissus Pseudo-Narcissus* contained an alkaloid and certain other principles of interest. He had not obtained any product in a state of purity, nor were any analyses forthcoming or other evidences of identity.

The Conference meeting of Wednesday opened with an interesting paper by Mr. E. SMITH, on the "Materia Medica of Devon." This, of course, included a sketch of the botany of the county, and an account of the large copper, iron, manganese, arsenic and other mining industries which are so actively prosecuted. Mr. SMITH, however, did not allude to the diminution of pyrites and manganese mining brought about since the large importation of these minerals first commenced.

The second paper on Wednesday's list was by

Mr. G. F. SCHACHT, who related "Some Experiences in the Equipment and Working of a small Pharmaceutical Laboratory." The paper was illustrated by some excellent drawings by Mr. J. T. THOMPSON, and gave rise to a conversation in which many gentlemen took part, and gave other personal experiences as to the best form of several pieces of laboratory apparatus and appliances.

Mr. W. H. MARTIN'S "Note on Diphenylamine as a Test for Nitric and Nitrous Acids" was illustrative of the observations made previously by Professor LUNGE, and recently published in this Journal. The test appears to be an exceedingly delicate one. In applying it a small granule of diphenylamine is placed in a test tube, and a drop or two of sulphuric acid added, then water so as to increase the temperature in order to effect a perfect solution of the diphenylamine. If to such a prepared test solution sulphuric acid be added containing only a trace of nitric or nitrous acid a beautiful permanent blue colour is immediately produced at the junction of the liquids.

A paper by Mr. J. C. THRESH on "The Pill Masses of the B.P.", contained a report on those which in his opinion are of inconvenient consistence or become so by keeping, and suggestions for their improvement.

After this, a paper by Dr. TILDEN was read upon "A Product of the Oxidation of Barbaloin and Socaloin," which he has named alloxanthin, constituting a yellow colouring matter closely related to chrysammic acid and to emodin.

It had been determined at the meeting of the previous day that Mr. S. R. ATKINS' paper "On a Point in Pharmaceutical Ethics" should be read without being subjected to discussion. This course was, however, protested against by Mr. GUYER, as forming an undesirable precedent, but the protest was overruled. In the paper Mr. ATKINS defined the specific positions occupied by pharmacists and medical men, and showed that it was quite feasible to decide the hotly disputed matter of counter practice without evincing bad spirit and acrimony. He contended that pharmacists had a public justification for counter practice in simple complaints, but warned them against carrying it to an unjustifiable degree.

This paper was followed by one relating to a question which not only affects a large trading interest, but is also one of importance as regards the public health. The paper in question was intended to elucidate the influence exercised by the presence of metallic compounds in alimentary substances. It was chiefly occupied with the results of an investigation by Dr. PAUL and Mr. KINGZETT into the physiological action of the copper known to be contained in preserved peas, particularly those of French manufacture, and it was shown by the authors that the copper as it exists in the peas is not only in an insoluble state and in actual combination with the albuminous constituents of the peas, but is not removed by the water used in the process of cooking. During digestion this copper passes entirely into solution if sufficient time be allowed; nevertheless it is for the most part excreted in the fæces, being probably reprecipitated through the agency of biliary fluid as phosphate. Only a very minute trace, therefore, is absorbed into the system, thus proving the non-injurious nature of such peas as an article of food. It was also shown that many compounds used largely in colouring confectionary contain from 6 to 70 per cent. of stannic oxide; besides which other articles of food containing metallic compounds were described. In the discussion which followed Dr. WRIGHT called attention to some instances of poisoning through the agency of lead, tin, and zinc, which had been reported in the daily papers. Dr. REDWOOD stated that, in his opinion, the vendors of preserved peas containing copper should be prosecuted on the ground that they were selling an article of food containing something not natural to the peas, but intentionally introduced. To this it was replied that persons who consumed such peas would not suffer the slightest injury to health, a conclusion which received considerable support from evidence given in the discussion by various speakers. It was particularly insisted upon by the authors that medical opinion, no matter how unanimous, was worthless, so long as that opinion was based upon an imperfect knowledge of the facts necessary for its formation.

The "Analyses of Preserved Carrots, Potatoes, "Cabbage, and Mixed Vegetables," detailed by Professor ATTFIELD in the next paper, have been for the most part previously published in the report of the Commission appointed to inquire into the causes of the outbreak of scurvy on the Arctic Expedition.

Mr. KINGZETT next read a paper on "Scammony Root," by Mr. FARRIES and himself, in which it was shown that the roots of *Convolvulus scammonia* contain no alkaloid, although it has been asserted by MARQUART that an alkaloid does exist in the root. Resin of scammony yields glucose on decomposition with dilute sulphuric acid and by various other processes given in the paper, an analysis of barium glucinate being brought forward in support. Mention was also made of the volatile oil produced below 90° C. by dry distillation of the resin; its examination is not completed.

In a "Further Note on the History of Tea Hair," Mr. T. GREENISH showed that the hairs contain no theine and gave a general description of their occurrence and properties.

Mr. L. SIEBOLD'S paper on "Copaiba Testing" showed that beyond fatty oils, such as linseed, turpentine oil was the only other probable adulterant. He also pointed out that the methods of testing still given in many books are valueless. He had found that Dr. MUTER'S process for testing copaiba also was unreliable, while the simple process of evaporation to dryness was sufficient to yield indications of purity or impurity, according to the stickiness or dry nature of the product. Turpentine could be easily detected when present, in the first portions obtained on the distillation of copaiba oil, and recognized by its lower boiling point and odour.

Mr. Moss stated in the discussion that as regards Fluckiger's test for the purity of copaiba oil, he had never experienced any difficulty in the use of it. Mr. W. W. Urwick's "new medicinal solution of phosphorus" consists of a preparation in which egg albumen is employed, and Dr. Redwood pointed out that he had already given a formula in which that substance was used for the purpose stated.

Mr. Kingzett's paper on "Blood Albumen" contained a detailed account of the process patented by Mr. Zingler and himself for bleaching and preserving blood albumen, and the various uses of the product. The process consists in passing a current of air through albumen solution admixed with a certain small percentage of turpentine, and maintained at about 40° C. The oil oxidizes, forming peroxide of hydrogen, which effects the bleaching, while the camphoric acid and other substances simultaneously produced preserve the solutions of albumen almost permanently from any putrescible or other change.

In his next paper on "Pilocarpine," Mr. Kingzett gave the analysis of a platinum salt made from a sample of the nitrate given to him by Professor Attfield, which proved the identity of the alkaloid with that to which he had previously assigned the formula $C_{23}H_{34}N_4O_4$. On distillation of the salt $C_{23}H_{34}N_4O_4$, 2HCl, $PtCl_4$ to dryness with strong caustic soda solution, trimethylamine appears to be produced.

The last paper read was by Mr. Willmott on the "Effects of Variations of Temperature on Boiled Putrescible Liquids."

It was then determined to hold the next annual meeting of the Conference at Dublin, and after the usual business matters had been concluded, including the appointment of a new President in the person of Mr. G. Schacht, the Conference dissolved.

On Thursday, notwithstanding a smart shower just before the time fixed for embarkation, a considerable number of ladies and gentlemen accepted the invitation of the Local Committee to join in an excursion up the River Tamar. The programme, as previously sketched out, was closely followed. The boat proceeded up the river as far as Cotehele, the grounds of which were visited, then returned to Pentillie where an ample lunch was followed by a stroll through grounds, from which a magnificent view including the windings of the river was obtained. The kindness of Colonel Corydon in throwing open the grounds was recognized in three hearty cheers given by the company. After the company had once more returned on board, the "Eleanor" proceeded on her course down the river to Mount Edgcumbe, where some landed whilst others went on for a run to the breakwater. By a little after six o'clock, however, the company had once more reunited in the "orangery," where, within view of numerous splendid specimens of the genus *Citrus*, bearing fruit and flowers in the open air, and within hearing of the musical strains of the capital band of the Royal Marines, "high tea" was served. Then, at the conclusion of a most successful day, the threatening clouds of the morning having soon dispersed, the President, Professor Redwood, speaking on behalf of the visitors, acknowledged the kindness and hospitality of the Local Committee, and also their appreciation of the generosity of the Earl of Mount Edgcumbe, which had allowed them to view his magnificent seat.

In concluding this notice it may be said that from the beginning to the end of the Conference meeting there was ample evidence that no effort had been spared to secure the comfort and enjoyment of the visitors, and there can be no doubt that in the manifest appreciation of this fact Messrs. Clark, Skinner, Turney, Codd, Balkwill, and the other members of the Local Committee will find the most grateful acknowledgment of their labours.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The President of the British Association delivered his Address at the Guildhall, Plymonth, on Wednesday evening, and a considerable portion of it will be found in another portion of this Journal. The topic was a biological one, the development of the forms of animal life, and was chosen by Dr. Thomson as one with which his studies have been particularly associated. The audience was not so numerous as it has been on some previous similar occasions. In fact, general appearances in the Reception Room and elsewhere would lead to the inference that the general attendance of members at Plymouth is not large; neither are the lists of papers to be read in the various sections very long. But it would be premature at present to pronounce a decided opinion in these respects.

A NEW ANTIEPILEPTIC.

Professor Xavier Landerer, of Athens, states that he has been able to recognize in a substance that has locally acquired some reputation as a remedy against epilepsy, the root of the *Clematis cirrhosa* or *sylvestris*. In two cases of epilepsy treated with a decoction of this root, which is strongly diuretic, there has been a cessation of the attacks for more than three months. The bruised fresh leaves of the plant act as a rubefacient, and sometimes even as a vesicant when applied to tender parts of the skin.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

The proceedings of the Fourteenth Annual Meeting of the British Pharmaceutical Conference commenced on Tuesday, the 14th inst., at the Athenæum, Plymouth. Professor Redwood, Ph.D., F.C.S., President, in the chair.

Mr. Codd, on behalf of the local pharmacists, having welcomed the Conference to Plymouth,

The President called on Professor Attfield, General Secretary, to read the names of delegates present

Professor Attfield expressed his pleasure in finding that this year not only every provincial association connected with pharmacy was represented there, but also each of the Pharmaceutical Societies, for there were now more than one; especially the Pharmaceutical Society of Great Britain had sent several delegates. The delegates present were as follows:—

Pharmaceutical Society of Great Britain.—The President (Mr. Williams), Messrs. Atkins, Cracknell, Greenish, Owen, Robbins, Savage, and Schacht.

Pharmaceutical Society of Ireland.—Messrs. J. A. C. Payne and C. R. C. Tichborne.

Midland Counties Chemists' Association.—Mr. Stokes Dewson.

Bristol Pharmaceutical Association.—Mr. Schacht.

Exeter Pharmaceutical Association.—Messrs. G. Delves and G. Pasmore.

Glasgow Chemists' Association.—Messrs. Davison and Frazer.

Leeds Chemists' Association.—Mr. Peter Jefferson.

Liverpool Chemists' Association.—Dr. Symes.

Manchester Chemists' Association.—Messrs. Benger and Siebold.

Wolverhampton and District Chemists and Druggists' Association.—Mr. Fleeming.

Mr. F. B. Benger, F.C.S., General Secretary, read letters from Mr. Brady, Newcastle, and Mr. Reynolds, Leeds, expressive of their regret at not being able to be present.

Mr. Benger then read the report of the Executive Committee as follows:—

Report of the Executive Committee.

In presenting their fourteenth annual report the Executive Committee again avail themselves of the opportunity of congratulating the members of the British Pharmaceutical Conference on the continued prosperity and usefulness of the association.

The work of your Committee during the past year presents no special features. The collection of members' subscriptions, the publication of the Year-Book, and the issue of the usual lists of proposed subjects for research, and of circulars having reference to the present meeting, are the chief items which have occupied their attention.

It will be seen from the balance sheet to be presented by the Treasurer, that practically the whole of the income of the Conference has this year been devoted to the advancement of scientific pharmacy. Your Committee believe that such a disposal of the funds is in strict accordance with the intention of the founders of this association, and with the wishes of present members; and they may be excused for looking with some pride, as well as much satisfaction, to the important services which the Conference is now, year by year, rendering to pharmacy proper, and therefore to the practice of medicine, and to the sanitary interests of the community. These results are being achieved, first, by the character and amount of the original matter directly communicated to the Conference by the authors of papers read at its annual meetings, and evolved during the discussion of such papers by the members present.

Then, secondly, by the substantial grants of money which your Committee have been able to make to gentlemen undertaking special costly researches connected with pharmacy, original work of the highest importance is being promoted, and discoveries are made which will have interest and value wherever medicine and pharmacy are practised; whilst the investigation of difficult and complicated problems, such as that undertaken by Messrs. Groves, Williams, and Wright on the aconite alkaloids are of great scientific and probable practical importance; moreover, they are scarcely likely to be undertaken by individuals at their own expense, and are on that account the more suitable subjects to be investigated at the partial cost of the Conference.

Thirdly, by the production and distribution of the now well-known 'Year-Book of Pharmacy.'

Fourthly, by the pleasant and profitable friendly intercourse brought about amongst the widely scattered pharmacists who assemble at our annual meetings.

The papers sent in to the Secretaries to be read at the present meeting are of great and varied interest, and sufficiently numerous to fully occupy the two days devoted to their reading and discussion.

A number of applications for grants in aid of research were received and considered during the Glasgow meeting.

The following amounts have been drawn during the year by members to whom such grants were voted, and reports on the various subjects will be presented:—Mr. J. C. Thresh, F.C.S., for the purchase of materials in connection with an extended research on the active principle of capsicum fruit, £7; Dr. Tilden, F.C.S., for the purchase of essential oils required in a research, £20; Mr. T. B. Groves, F.C.S., Mr. J. Williams, F.C.S., and Dr. C. R. A. Wright, F.C.S., for the extraction and investigation of the aconitines of *Aconitum Napellus*, £30; Mr. M. M. P. Muir, F.C.S., for a second research on oil of sage, £3.

The salary of the Editor of the Year-Book has been advanced from £100 to £150 per annum.

It was at the Exeter meeting of the Conference in 1869 that the Sub-Committee appointed to consider the desirability of publishing a 'Year-Book of Pharmacy' presented their report; and on the motion of Messrs. Palk and Cooper that the recommendation was adopted. At that date the Conference numbered less than 700 members. After an absence of eight years the Conference has returned to Devonshire. Its membership roll now contains between 2000 and 3000 names, and the Year-Book occupies a deservedly high position amongst the publications of the year, and is, as it was intended to be, the familiar desk companion of the pharmacist.

It may be remembered that the MS. of the 1876 volume, was laid on the table by the editor at the last annual meeting: its issue was however, unavoidably delayed by circumstances beyond the control of the Committee, mainly, in consequence of the illness of the editor, and the great pressure on his time, caused by accumulated work and engagements. Some loss of members has doubtless been caused to the Conference by this unfortunate circumstance, but your Committee confidently hope that the forthcoming volume will be in the hands of the members before the end of the year. The MS. is now complete, with the exception of the introduction, and the editor, having made arrangements which relieve him of all business engagements, is able to devote his whole time to literary and professional work; your Committee have felt it to be due to the members to make this statement, as much disappointment has been felt by those who were unacquainted, or only partially acquainted with the circumstances of the case.

At a meeting of your Committee held last evening Professor Attfield placed on the table, with the usual eighteen guineas' worth of books from the Bell and Hills Library Fund, copies of Hanbury's 'Pharmacographia' and 'Science Papers,' stating that Mr. Thomas Hanbury desired to present a copy of each of these works in memory of his brother, the late D. Hanbury, F.R.S., to the local associations in towns visited by the Conference.

In conclusion, your Committee would urge members to bring the Conference under the notice of as many of their pharmaceutical friends as possible: the mere mention of the objects aimed at by the Conference, the advantages derived from membership, the intrinsic value of the Year-Book and the smallness of the annual subscription, are generally sufficient to ensure a willingness to be nominated for election. It should be borne in mind that the Conference must of necessity lose yearly many members from various causes, and that merely to maintain its present strength, a considerable number of new names must be added annually.

The Treasurer, Mr. Schacht, read the Financial Statement (see following page).

On the motion of the President, the report and accounts were received and adopted.

The Treasurer then read the statement with regard to the "Bell and Hills" Library Fund (see following page).

The President suggested that the thanks of the Conference be presented to Mr. Thomas Hanbury for the gift of books referred to in the report, which was unanimously agreed to.

Professor Attfield said he had next to announce that Mr. T. H. Hills, in addition to the books already alluded to, had commissioned him to present to the local association two portraits of eminent pharmacists, viz., the first President of the Pharmaceutical Society, Mr. William Allen, and the second that of Mr. Jacob Bell. He hoped these portraits would be placed in the room which would hereafter become the library of the Association.

Mr. R. J. Clark (Local Secretary) moved a vote of thanks to Mr. Hills, and said he hoped the books now presented would form the nucleus of a library which should be extensively used by the young men engaged in the practice of pharmacy.

The motion was seconded and carried unanimously.

The President next delivered the following address:—

The President's Address.

Gentlemen,—As you have done me the honour of placing me again in the President's chair it becomes my duty to address you at this stage of our proceedings, and I think I cannot more appropriately commence my address than by referring to the satisfactory evidences of the continued prosperity of our association, which are afforded us in the reports which have been read relating to the past year, in the prospect we have of much good matter for the present meeting, and in the indications we receive from various quarters of a desire to co-operate with us in furthering the objects for which we have met here in conference.

One of the objects we desire to promote by these meetings is that of effecting a union of pharmacists for scientific purposes on the broadest basis, and of bringing into close and friendly intercourse not only the scattered members of the body we represent, but those of other associations and of every nationality, who have a common interest with us in the advancement of the art of pharmacy. We are endeavouring to effect such advancement by an extension of pharmacological studies and researches among those with whom we are associated, and by encouraging the cultivation of the knowledge which will best enable the druggist to fulfil the duties which the requirements of the public and the medical profession impose upon him. The means which are adopted by this and other kindred associations for effecting these important objects, if they be pursued in unison with each other, as I believe they are being, and are likely to be, cannot fail to produce results that will tend to place the practice of pharmacy in the honourable position it deserves to occupy. If at times any of our friends should be ready to falter in their progress, and to fear that we are pursuing a course which may lead them away from the few substantial advantages they possess into the utopian regions of empty honour, it behoves us to hold out the hand of encouragement, and to endeavour to demonstrate to them that the profit and the honour resulting from our professional occupations will mainly depend on the value of the services we are enabled to render to those who have pressing need of them, and the completeness of the qualifications we possess for the efficient performance of all we undertake to do. The position in which we as pharmacists are placed in the present day is very different from that which our predecessors, the druggists of a century and a half ago, occupied. The druggist of the 17th century has become an extinct species, while the druggist of to-day has been transformed into the apothecary of the 17th century. In the transitions which have thus taken place we may find matter from which to derive profitable instruction. We may also learn from a restrospect of our past history, that there has always been in this country an indisposition to legislate in reference to the practice of medicine until the public wants have developed the means of providing what is required and best suited to supply them.

The early history of the practice of medicine in this country is involved in some obscurity, but it appears that both medicine and pharmacy were formerly often associated with the ecclesiastical profession, and that surgery, being of too sanguinary a character to admit of such an association, formed a more natural alliance with the occupation of the barbers.

Medicine, but not surgery, was studied at our universities, but there was no law to define the qualifications of a physician or to regulate the practice of medicine.

Before legislation commenced on these subjects, the surgeons took the lead of the physicians in obtaining recognition from the Government.

About the middle of the 15th century a charter of incorporation was granted by Edward IV. to the company of barber-surgeons, who were invested with authority to examine the instruments and remedies employed, and to bring actions against those who practised illegally and ignorantly, none being allowed to practise who had not been previously admitted and judged competent by the master of the company.

An attempt to legislate for the purpose of regulating the practice of medicine had been made as far back as the year 1422, at the instigation of the universities of Oxford and Cambridge, where degrees in physic were granted to those who had studied for the profession; but although an Act passed through Parliament in that year to the effect that "no one shall use the mystery of physic unless he hath studied it in some university, and is at least a bachelor in that science," this Act appears not to have come into operation, for having been referred to the Privy Council for confirmation, it was there allowed to drop.

The first successful attempt at legislation was made in 1511, when a law was passed which imposed upon physicians and surgeons practising as such in and around London, and also in the provinces, the necessity of passing an examination, and being approved and admitted, by a body of examiners consisting of the bishop or some other dignitary of the church, with four members of the faculty of medicine.

The College of Physicians was established by Royal Charter in 1518, and four years afterwards, in 1522, a law was passed by which the examination of those allowed to practise as physicians was transferred to the college from the body previously entrusted with the performance of this duty.

Independently of the barber-surgeons, there was but one class of recognized medical men, namely, the physicians, who prepared and dispensed the medicines they prescribed. The only class of men who at that time could be properly called apothecaries were the assistants employed by the physicians to prepare their medicines.

FINANCIAL STATEMENT, 1876-77.

THE GENERAL FUND.

THE SENIOR HON. SECRETARY IN ACCOUNT WITH THE BRITISH PHARMACEUTICAL CONFERENCE.

FOR THE YEAR ENDING JUNE 30, 1877.

Dr.	£	s.	d.
To Sale of Year-Books by Secretary	15	0	0
,, ,, ,, Publishers	27	8	4
,, Advertisements in 1875 vol.	8	15	6
,, ,, 1876 vol.	101	6	6
,, Subscriptions from Members	771	7	4
	£923	17	8

Cr.				£	s.	d.
By Expenses connected with Year-Book:—						
Butler and Tanner for printing, binding, and banding	£438	19	1			
Editor's Salary	150	0	0			
Messrs. Churchill:—						
Commission on advertisements	27	10	6			
Advertising Year-Book	2	12	0			
Delivery to Members	73	0	7			
Foreign Journals (Nutt).	6	12	2			
,, ,, (Skeet)	1	1	0			
				699	15	4
,, General Printing:—						
Butler and Tanner	17	4	4			
Stevens and Richardson	8	4	0			
Parkins and Gotto	2	5	4			
				27	13	8
,, Directing Circulars and Envelopes				6	12	9
,, Assistant-Secretary's Salary				40	0	0
,, Postage (about 12,000 letters)				48	1	4
,, Sundries				8	15	2
,, Expenses of Meeting at Glasgow				24	9	4
,, Grants in Aid of Research				60	0	0
,, Balance paid to Treasurer				8	10	1
				£923	17	8

THE HON. TREASURER IN ACCOUNT WITH THE BRITISH PHARMACEUTICAL CONFERENCE.

FOR THE YEAR ENDING JUNE 30, 1877.

1876.	*Dr.*	£	s.	d.
	To Balance in hand on July 1, 1876	241	16	4
July 10	To Dividend on £200 3 per cent. Consols	2	19	3
1877.				
Jan. 10	,, Dividend on £400 3 per cent. Consols	5	18	6
June 30	,, Balance of General Fund, 1876-77 received from Dr. Attfield	8	10	1
		£259	4	2

1876.	*Cr.*	£	s.	d.
Aug.	By Purchase of £200 3 per cent. Consols at $96\frac{3}{8}$, and Brokerage 5*s.*	193	15	0
	,, Balance in hand	65	9	2
		£259	4	2

Assets July 1, 1877		£	s.	d.
	Cash in hand	65	9	2
	Consols (stock)	400	0	0

THE BELL AND HILLS LIBRARY FUND.

THE HON. TREASURER IN ACCOUNT WITH THE BRITISH PHARMACEUTICAL CONFERENCE.

FOR THE YEAR ENDING JUNE 30, 1877.

1876-77.	*Dr.*	£	s.	d.
	To Balance in hand on July 1, 1876	5	18	1
Sept. 1	,, Dividends from four £50 Russian Bonds	4	17	9
March 1	,, ,, ,,	4	18	3
		£15	14	1

1877,	*Cr.*	£	s.	d.
June	By Dr. Attfield for Purchase of Books for Plymouth	10	10	0
	,, Balance in hand	5	4	1
		£15	14	1

Assets July 1, 1877.		£	s.	d.
	Cash in hand	5	4	1
	Russian Bonds (stock)	200	0	0

Examined and found correct, { T. DAVISON, Glasgow, S. B. TURNEY, Plymouth, } *Auditors.*

Some of these assistants from time to time, no doubt, started on their own account, and probably occupied an equivocal position either as doctors or dealers in medicines, for until the year 1511 there had been no law to define the qualifications of a physician, and at that period, and for many years afterwards, there is no evidence of the existence in this country of a body of men engaged on their own account as dispensers of medicines. This indeed would necessarily have resulted from the fact that physicians were not then in the habit of writing prescriptions for their patients. The first notice we find of apothecaries engaged in business as such, and probably these were only dealers in compounded medicines, is in the middle of the 16th century, when the College of Physicians acquired the power of searching apothecaries' shops, examining their medicines, and destroying such as were found to be unfit for use.

It appears that about this time the surgeons were considered to have exercised the power that had been given them of restricting the practice of their profession to members admitted by their Company, too strictly, and without sufficient regard to the requirements of the poor. An Act of toleration was therefore passed in 1542, which set forth that "the Company and Fellowship of Surgeons of London, minding onely their oune lucres, and nothing the profit or ease of the diseased or patient, have sued, troubled, and vexed divers honest persons, as well men as women, whom God hath endued with the knowledge of the nature, kind, and operation of certain herbs, roots, and waters, and the using and ministering of them, to such as have been pained with customable diseases, as women's breasts being sore, a pin and the web in the eye, uncomes of the hands, scaldings, burnings, sore mouths, the stone, stranguery, saucelin and morphem, and such other like diseases. . . . And yet the said persons have not taken any thing for their pains and cunning. . . . In consideration whereof, and for the ease, comfort, succour, help, relief, and health of the King's poor subjects, inhabitants of this his realm, now pained or diseased, be it ordained, etc., that at all time from henceforth it shall be lawful to every person, being the King's subject, having knowledge and experience of the nature of herbs, roots, and waters, etc., to use and minister them according to their cunning, experience, and knowledge . . . the aforesaid statute (the Act of 1511) or any other Act notwithstanding."

This Act was intended for the relief and toleration of those who, although not legally qualified medical men, yet possessing some knowledge of medicines, administered them gratuitously. The previously existing law was still allowed to take its course against notorious quacks and ignorant pretenders, many of whom were punished by fine and sometimes by exposure in the pillory.

As yet we have no knowledge of druggists as a recognized class of traders. Crude drugs were mostly supplied by grocers, who dealt in foreign drugs as well as grocery, and by herbalists and simplers who collected indigenous medicinal plants. Those grocers who gave most attention to, and were best acquainted with, drugs, became drug-grocers, and these assuming the title of druggists, confined themselves to this class of merchandise. The physicians purchasing the crude drugs from such sources, not only dispensed, but also prepared and compounded such medicines as they administered to their patients. But this practice was felt to be irksome and unsuited for members of a learned profession, therefore, in the early part of the seventeenth century, physicians were getting into the habit of issuing prescriptions or "bills" as they were then called, which necessarily caused the establishment of dispensing apothecaries, the number of whom must have increased as this new practice extended.

Until the year 1618 there had been no authorized pharmacopœia, and indeed such a work could not have been required while physicians were their own apothecaries, but when prescribing and dispensing became distinct and independent occupations it was necessary to have a recognized and authoritative standard by which to determine the meaning and value of the terms employed in extemporaneous prescriptions. Hitherto the medicines used belonged principally to the class called galenical, for which complicated formulæ had been handed down from generation to generation for centuries, without any attempt having been made to improve or alter them. But with the sixteenth century a new class of remedies was introduced which, in spite of much opposition, acquired and maintained a position which was daily increasing in importance, and to the more extended use of this class of chemical agents in medicine may in part be ascribed the necessity which arose for a class of men trained and exclusively devoted to the practice of pharmacy, including the preparation of chemical and galenical medicines.

Pharmacy was now for the first time assuming an independent position in this country, but circumstances which followed this result contributed more to the production of a new form of medical practice than to the maintenance and improvement of pharmacy as an independent art. In 1606 the apothecaries, then few in number, formed an alliance and became incorporated with the grocers, but this alliance was shortly afterwards dissolved, and in 1617 the Apothecaries' Company was formed, for which a charter was obtained giving them some exclusive privileges. They established a dispensary near Blackfriars Bridge in 1623, for the preparation of some of the more important medicines then in use, and to this was subsequently added a chemical laboratory in 1671. The medicines prepared or manufactured at this establishment were only supplied to members of the company for use in their practice. The establishment still exists under the title of Apothecaries' Hall, but important changes have been made in the character of the institution and the purposes to which it is applied.

At the time of the formation of the Apothecaries' Company, the number of its members was 114, and that this number included all the then established apothecaries may be inferred from the fact that a few druggists or drug-grocers were included in the Company to make up the number to that of the physicians practising in London.

The apothecaries were a prosperous body, and probably this was to no inconsiderable extent due to the incidence of their advent at a time when wealth and luxury, pestilence and poverty were providing a rich harvest for doctors of all degrees, while the law had only provided doctors of one, and that the highest degree. Oxford and Cambridge had furnished London with 114 physicians, learned in all the science and mystery of physic as then taught at the Universities, but London with its densely packed and increasing population, with its undrained streets and festering cesspools, seemed to require something more than this to stay the ravages of plague and other forms of pestilence. The apothecaries had been trained in a school in which medicine and pharmacy, dispensing and prescribing, went hand in hand, and it need not be matter of surprise that with so many demands for medical advice for the poor, and for those who could ill-afford to pay a physician, they were easily induced to apply such knowledge as they possessed in ministering to the relief of the sick, without too nicely considering the extent of their qualifications for doing so. It is a significant fact, that although prosecutions were frequently instituted against ignorant quacks, and although the College of Physicians took proceedings against members of the College of Surgeons for prescribing in other than surgical cases, and successfully prevented such practice, yet for a century or more the apothecaries were permitted to pursue an illegal practice which commenced with the treatment of trifling ailments, but grew by degrees and was supported by public opinion, until it not only rivalled, but surpassed in extent, the practice of legally qualified physicians. The result of this was that in less than a hundred years the number of apothecaries increased from 114 to nearly 1000, and notwithstanding the many and strong protests which were made by some of the physicians against the encroachments of apothecaries upon their legitimate functions, this was of no avail, so long as there was a great public want that was not otherwise provided for than by allowing the members of a lower grade of the profession to overstep the strict limit of their duties.

It was in the seventeenth century that druggists, as distinguished from grocers, came into existence and assumed a recognized position among traders. To the title of druggist they afterwards added that of 'chemist when chemical medicines came into more general use, but the chemist and druggist was at first and for some time, with perhaps a few exceptions, a mere dealer in drugs and chemicals, without possessing or pretending to possess the knowledge required for their preparation or production, and as yet they had nothing to do with the dispensing of medicines prescribed by the physicians.

It was not until the middle of the last century that chemists and druggists undertook the duty of dispensing medicines, and they were called to the performance of this duty in consequence of the apothecaries having relinquished the position they had originally occupied and usurped the functions of medical men.

The transference of the dispensing of physicians' prescriptions, however, was not made directly from the apothecary to the chemist and druggist. There was an intermediate period during which much of the dispensing in London was done at institutions, called dispensaries, which had been established by the physicians, ostensibly to enable the poorer classes to get prescribed and other medicines at a moderate cost. These dispensaries, of which there were three, were established in 1697, by subscriptions from the fellows and members of the College of Physicians. The principal establishment was in Warwick Lane, Newgate Street, at the Hall of the College of Physicians, where medicines were not only dispensed but prepared for use in dispensing at the other establishments in St. Martin's Lane, Westminster, and St. Peter's Alley, Cornhill.

The physicians justified the establishment of these dispensaries, on the ground that while they were in the habit of prescribing gratuitously for the poor, their patients had no means of getting the prescriptions prepared without taking them to an apothecary, who was often in such cases not only ready to replace the prescriber, but accustomed to make unnecessarily high charges for the medicines supplied.

A very acrimonious controversy took place between the physicians and apothecaries respecting these dispensaries, and they were at length given up when druggists undertook the duty of dispensing for which they had been preparing themselves.

There is reason to believe that the physicians' dispensaries, while they existed, were the schools at which instruction was principally acquired by those who were intending to establish themselves as dispensing chemists and druggists. By the middle of the last century, the dispensaries had disappeared, and soon afterwards chemists and druggists began to display the notice, "Physicians' prescriptions carefully prepared."

We thus arrive at the distribution of medical and pharmaceutical duties, such as exists at the present time, and it will be seen that the arrangements adopted when druggists took the position previously occupied by the apothecaries, resulted from the growing wants of the public, which were not otherwise provided for. Legislation has followed our medical and pharmaceutical institutions with slow and reluctant steps, and has been chiefly directed to the remedy or prevention of evils when these have appeared and have grown into serious abuses. At the time when druggists became dispensers of medicines, no adequate provision had been made by the legislature for the medical treatment of all classes of the population. Colleges of physicians and surgeons had been established with powers, which, if they had been exercised to their fullest extent, would have left a large proportion of the people without even the consolation of having their ailments ministered to by those who, although not possessing the highest medical knowledge, were the only medical advisers their means enabled them to consult. The apothecary, without any specified or required qualifications for such a duty, had become the poor man's doctor, and public opinion and the liberality and good sense of the heads of the medical profession enabled him to maintain that position until better arrangements were made.

The regulations adopted in other countries present a marked contrast with such as have existed here. From early periods, dating back to the twelfth and thirteenth centuries, we may trace the recognition of pharmacy as a distinct and separate branch of the medical profession in continental countries. In France and Germany apothecaries' shops existed in most of the large cities in the thirteenth, fourteenth, and fifteenth centuries, and these were sometimes kept up at the public expense, with botanic gardens attached to them. The number of these establishments greatly increased in the fifteenth and sixteenth centuries, when they were placed under strict regulations. Laws were passed for regulating the practice of pharmacy in France in the early part of the sixteenth century, and on several occasions throughout that century. The tendency of legislation in France, Germany, and Italy was to effect and maintain a complete separation between the treatment of disease and the preparation and dispensing of medicines. The law defined and limited the nature of the occupations, in the critical direction, which practitioners of pharmacy were allowed to engage in, and a sense of emulation stimulated the members of the body thus circumscribed in their pursuits to the attainment of the qualifications required for the discharge of the duties assigned to them. It was never a question with them whether they should become general practitioners of medicine; if it had been, pharmacy and the shop would have gradually sunk in their estimation while they were seeking to attain to a higher grade in the profession of medicine. But tied as they were to the plain and legitimate duties connected with the preparation and dispensing of medicines the only direction in which they could hope to elevate their social and professional position was that of increasing their professional qualifications. Long before pharmacy had emerged in this country from the condition in which it was represented by the physicians' assistants, there was a class of independent apothecaries or pharmaciens in Paris who were supporting a school for the special instruction of those who were intending to devote themselves to this occupation. In the year 1576 this school was founded by a public-spirited pharmacist, Nicholas Houel, who deserves to be canonized among pharmaceutical worthies. The Paris School of Pharmacy afterwards received the support of the corporation of apothecaries, and ultimately became the College of Pharmacy, in which so many distinguished pharmaciens have been trained.

By these and similar means, adopted not only in France, but also in most other continental countries, the practice of pharmacy being strictly defined and limited to the exercise of functions for which its followers were especially and well qualified, has assumed the character of a profession, the members of which fill an important position in the social scale.

If we now return to our own country and to the middle of the eighteenth century, we find laws existing for regulating the qualifications of physicians and surgeons and for restricting medical and surgical practice to examined and approved members of those branches of the profession. We also find a Society of Apothecaries with a charter authorizing them to prepare, dispense, sell, and administer medicines. These apothecaries, having been originally the servants, were now the attendants of the physicians, whose duty it was, if called in with a physician to carry his instructions into effect, not only preparing and sometimes administering the prescribed medicines, but performing operations that are now left to the nurse. To a certain extent, the apothecary was supposed to be, and generally was, an educated man, that is to say, he had served an apprenticeship to one of the same class, and being intimately associated with the physicians, he had frequent opportunities of observing how they treated their patients, especially as the prescriptions or "bills" as they were called, all passed through his hands. Pope in his 'Essay on Criticism,' which was written in the early part of last century, says:

"So modern 'potecaries,' taught the art
By doctors' bills to play the doctors' part;
Bold in the practice of mistaken rules,
Prescribe, apply, and call their masters fools."

But not unfrequently the apothecary was called in without the physician, and then he usurped the functions of both, for which, however, his education had not properly qualified him, for he had not necessarily received a systematic and scientific education, nor had he passed any examination. This was a subject of complaint between the physician and apothecary, which for a century or more had been growing stronger and louder. As a natural consequence physicians ceased to advocate the calling in of an apothecary and transferred their patronage to the rising and rapidly increasing class of chemists and druggists. We find this class of recently introduced compounders and dispensers of medicines taking zealously to their new occupation, and apparently thriving, as the apothecaries had done when they first started on their career. They were good men of business, but had no pretensions to much education of any sort, and they were not even required, as the apothecaries were by their charter, to have served an apprenticeship to one who practised the same art.

The rise and progress of dispensing chemists and druggists caused, as might have been expected, a falling off in the prosperity of the apothecaries, and complaints soon began to be made on this account.

In 1748, an Act was passed which extended the powers given to the Society of Apothecaries by their charter and enabled them to examine and grant licenses to those who were authorized to act as apothecaries in and within seven miles of London. It was through the power supposed to have been given to them by this Act that they endeavoured some years afterwards to prevent druggists, not only from dispensing the medicines prescribed by physicians, but also from selling any compounded medicines. It is probable that, strictly speaking, they had legally acquired a monopoly in these respects, but when it was known how they intended to apply the power they had acquired, it soon became evident that the public and the higher branches of the medical profession would not support them in maintaining such a position.

It was not until the end of last century, that any active steps were taken with the view of contesting the right of chemists and druggists to prepare, compound, dispense and sell medicines. In 1793 an association of apothecaries was formed, for the purpose of investigating the causes of the diminished prosperity which was complained of among their fraternity, and which was ascribed to two principal causes.

"First, the encroachment which chemists and druggists have, of late years, made on the profession of the apothecary, by vending pharmaceutic preparations, and compounding the prescriptions of physicians."

"Secondly, the want of a competent jurisdiction in the profession itself, to regulate its practice and to restrain ignorant and unqualified persons from practising at all."

A committee of twenty members was appointed who met once a month at the Buffalo Tavern, in Bloomsbury Square, and by means of an extensive correspondence with apothecaries throughout the kingdom they obtained a vast amount of statistical and other information which was published in their reports, and a detailed account of which is given by Mr. Bell, in his 'Historical Sketch of Pharmacy.' It was ascertained as the result of the inquiry that druggists were springing up in every part of the country, and in some places with a four-fold increase in ten or twelve years, that they undertook the dispensing of prescriptions and the sale of medicines of all sorts, and were in the frequent habit of prescribing for those who applied to them for advice. Evidence was adduced to show that many of these druggists were ignorant of the meaning of terms used in prescriptions, and of the qualities and effects of the drugs they were dealing in, but the evidence went also to show that not a few of those who practised as apothecaries were equally ignorant, and that even the power given to the Society of Apothecaries by the Act of 1748 to grant licences on examination was only partially and very imperfectly applied. The final result of the committee's labour was that addresses embodying these facts and suggesting a system of reform were presented to the Colleges of Physicians and Surgeons and the Society of Apothecaries, after which a petition was presented to the House of Commons, and there the matter ended.

The physicians and surgeons had taken no part in this contest between the apothecaries and chemists and druggists. Even the Society of Apothecaries in their corporate capacity appear to have held themselves aloof. All the parties interested, and still more those who were disinterested, must have seen that the contention had reference to private gain more than the public good. Yet there can be no doubt that great advantage resulted from the searching inquiry that was made into the merits and demerits of the opposing candidates for public favour. Public opinion had given to the apothecaries, or at least had called them into, a position which was by no means an unimportant one, but it obviously involved the relinquishment of that which they had previously held, and which was now being handed over to the chemists and druggists. Neither party were as yet fully qualified for the duties they were undertaking, and of this, if they were not themselves previously sensible, they must have been rendered so by the discussions which took place on the subject. The contest was comparatively a short and harmless one, and being over, each party no doubt retired with the wise determination to set his own house in order before he again complained of his neighbour's. Such a resolution, if carried into effect, must have tended to strengthen the chemists in their position, for the better qualified their adversaries became for medical practice, at which they were aiming, the less fitted they must necessarily have become for the duties of dispensing. On the other hand, a large number of chemists and druggists, including the founders of many pharmaceutical establishments in London, and various parts of the country, which have acquired and sustained high reputations, devoted themselves to the carrying out of the most approved methods of preparing and dispensing medicines, which secured to them extensive patronage, and enabled them effectually to silence any further attempts at an outcry, such as was previously raised by the apothecaries on account of the assumed encroachment of chemists on their privileges.

A period of eighteen years now elapsed before any further steps were taken to legislate on medical affairs; but in 1813, an association of apothecaries, not the Society of Apothecaries, again appeared in the field, and introduced a bill into parliament, which proposed to create a licensing board consisting principally of apothecaries with a few physicians and surgeons, who were to have the power of licensing not only apothecaries, but chemists and druggists also, although the latter were not to be represented in, and were to have no voice in the election of, the board. This bill was immediately opposed by the chemists, and as it met with little favour either in or out of the profession, it was soon withdrawn.

Two years afterwards the Society of Apothecaries took up the subject of legislation and carried the Apothecaries Act of 1815, by which the practice of apothecaries has been since regulated. If we may judge from the statements of the authors of that bill and their representatives, the measure was not intended to interfere in any way with the then established and admitted practices of chemists and druggists, in preparing, dispensing, and selling medicines. The Committee of chemists and druggists, however, who were appointed to watch the progress of the measure, influenced perhaps by the attempt which had previously been made, on the strength of the then existing law, to prevent any but apothecaries from dispensing prescriptions, insisted on having a clause introduced into the bill, which should not only in general terms exempt chemists and druggists from its operation, but should specify the acts for which such exemption was granted. In the clause as it stands in the Act, the words, "in the buying, preparing, compounding, dispensing, and vending drugs and medicinal compounds, wholesale and retail," were introduced at the suggestion, and by the desire of the Committee acting under the advice of counsel. In fact, everything that was asked for by the Committee was granted, and the bill passed without further opposition.

By this Act the original charter granted to the Society of Apothecaries by King James the First in 1617 was confirmed, except that the jurisdiction of the Society, which by the charter had been limited to London and its environs was now extended to England and Wales, and fresh powers were given them to examine candidates and grant certificates to such as were qualified to practise as apothecaries or to act as assistants to apothecaries. The Act having recited, that "whereas it is the duty of every person using or exercising the art and mystery of an apothecary, to prepare with exactness, and to dispense such medicines as may be directed for the sick by any physician lawfully licensed by the president and commonalty of the Faculty of Physic of London, or by either of the Universities of Oxford or Cambridge," proceeds to enact that every apothecary shall be subject to a penalty if he refuse to make, mix, dispense, apply, or sell any medicines so prescribed by a physician, or if he negligently, falsely, or fraudulently prepare and sell such medicines. These, however, were mere confirmations of what had previously been considered to be the duties of an apothecary as defined in their Charter and in the Act of 1748. The important feature of the Act of 1815 is contained in the fourteenth clause, which specifies that no person thereafter, except those previously practising, shall be authorized to practise as an apothecary in England or Wales, unless he has been examined and has proved his skill and abilities *in the science and practice of medicine*, and his fitness and qualifications to practise as an apothecary. This gave to the apothecaries, by legal enactment, what they had previously assumed in opposition to many protests from physicians, namely, the right to practise medicine. The clause in the Act which exempts chemists and druggists from its operation as far as relates to "the buying, preparing, compounding, dispensing, and vending drugs, medicines, and medicinable compounds," established the right which chemists had also previously assumed in opposition to many protests from apothecaries, but it had become more important to have this right clearly defined, as now for the first time there were heavy penalties imposed on those who infringed the privileges of the apothecaries.

Under this Act the apothecaries entered upon a new career, and although it was some time before any marked change was observed in the general character of this part of the profession, yet gradually they have become more highly qualified for their professional duties, and being now merged in the great body of medical practitioners they occupy an important and honourable position among those to whom all medical and sanitary affairs are entrusted. Their weak point, no doubt, is materia medica and pharmacy, which might be advantageously relinquished by those who practise medicine if the habits and requirements, not to say the necessities, of the public would admit of it.

A long interval was allowed to elapse after the passing of the Apothecaries Act before any measures having a similar object were adopted for regulating the qualifications of chemists and druggists. What has since been done by the Pharmaceutical Society is too well known and appreciated by those I am addressing to require comment here. A distribution of medical and pharmaceutical duties has been gradually effected to meet the exigencies of a great mixed population, and to the extent to which these have been established by law the public are provided with the means of having their medical wants supplied by men well qualified in their several departments.

We represent one of these departments, in connection with which we are endeavouring to raise the standard of professional proficiency by promoting scientific research in those branches of knowledge which relate to the preparation of medicines. This is our special object, and although, for the purpose of meeting what has been represented as a present want among our members, I have referred to some historical details, it has been my desire to deal with them simply as matters of fact which are not intended for general discussion here. Our tendencies lie in another direction and I feel assured that the matter which will be submitted for our consideration, and the discussions relating to it, will show that we are following out our own proper subjects and advancing their scientific and practical study in a way best calculated to make the practice of pharmacy at once honourable and useful to those who are engaged or interested in its pursuit.

Mr. Balkwill (Plymouth) proposed a vote of thanks to the President for his opening address. Last year, at Glasgow, he had delivered an address which he characterized as an outspoken and eminently useful one, and that of this year seemed to be no less so. The future could only be judged by the past, and if there had been times of difficulty heretofore which had been safely passed through by those now occupying honourable positions in the community, it was highly encouraging to those who could not help seeing that the present time was one of transition in relation to pharmacy. The distinguishing mark of the present day was division of labour, and for his own part he accepted most thankfully the fact that their field of labour was entirely distinct from that of the medical man. At the same time their field lay side by side with that of the physician, and their duties could not be properly carried on without a knowledge of some of those matters which properly belonged to medicine, especially physiology and therapeutics. In nothing probably was there greater ignorance than in therapeutics, and he believed that most light was to be thrown upon it from the side of pure chemistry, and he wished therefore that those who were studying chemistry in the laboratory could have opportunities of studying it in the human body, because he believed that in this way more useful results might probably be derived than even from the ordinary practice of medicine. He just threw out this idea, but he must add that he was quite aware of the temptation to which such studies might give rise, and that some might be tempted to dabble in prescribing, and to become bad medical practitioners instead of good chemists. Still it must be remembered that no position in life was free from temptation, and this seemed to him to hold out a most promising field for research.

Mr. E. Smith (Torquay) seconded the motion which was put by Mr. Groves, as Senior Vice-President, and carried by acclamation.

The President having briefly thanked the meeting, the reading of papers was commenced.

(*To be continued.*)

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The meeting of the British Association for the Advancement of Science commenced on Wednesday, August 15, at Plymouth, under the presidency of Allen Thomson, M.D., L.L.D., F.R.S., F.R.S.E., who, according to usual custom, delivered the opening address:—

The President's Address.

After the long interval of six and thirty years the British Association for the Advancement of Science holds its annual meeting, the forty-seventh since its foundation, in this beautiful and interesting locality; and, strangely enough, on this occasion as on the former, it passes from Glasgow to Plymouth. We are delighted to be assembled here, and are even surprised that the Association has been able so long to resist the power of attraction by which it has been gravitating towards this place. While we are prepared to be charmed with the surpassing beauty of its scenery, and know the deep interest of its prehistoric vestiges, its historic memories, and its artistic associations, we have been frequently reminded of its scientific vigilance by the records of its active scientific work; and we are now ready and anxious to witness all we can behold of its energy and success in the application of scientific discovery to the practical arts. Should we, as might be expected in a place hitherto so famous in its relations to our naval and military history, find most prominent those relating to the mechanism of war, we shall still hope that the effect of greater perfection in the engines of destruction may only be the means of rendering peace more permanent and secure.

It is a source of regret to myself, and may be, I fear, a cause of detriment to this meeting, that the choice of a President should have fallen upon one whose constant occupation with very special branches of science has fitted him so inadequately for the distinguished position to which he has been called. I can only derive comfort from knowing that, wherever it may be necessary, there are many others present most able to supply what may be wanting on my part; and I must therefore at once bespeak their assistance and your indulgence.

I have selected for the subject of the remarks which I am about to offer for your acceptance a biological topic, namely, the "Development of the Forms of Animal Life," with which my studies have been occupied, and which has important bearings on some of the more interesting biological questions now agitating the scientific world. But before proceeding with the discussion of my special subject, it is my desire to call your attention shortly to the remarkable change in the manner of viewing biological questions which has taken place in this country during the last half century—a change so great, indeed, that it can scarcely be fully appreciated except by those who have lived through the period of its occurrence.

In the three earlier decades of this century it was the common belief, in this country at least, shared by men of science as well as by the larger body of persons who had given no special attention to the subject, that the various forms of plants and animals recognized by naturalists in their systematic arrangements of genera and species were permanently fixed and unalterable, that they were not subject to greater changes than might occur as occasional variations, and that such was the tendency to the maintenance of uniformity in their specific characters that, when varieties did arise, there was a natural disposition to the return, in the course of succeeding generations, to the fixed form and nature supposed to belong to the parental stock; and it was also a necessary part of this view of the permanency of species that each was considered to have been originally produced from an individual having the exact form which its descendants ever afterwards retained. To this scientific dogma was further added the quasi-religious view that in the exercise of infinite wisdom and goodness, the Creator, when He called the successive species of plants and animals into existence, conferred upon each precisely the organization and the properties adapting it best for the kind of life for which it was designed in the general scheme of creation. This was the older doctrine of "Direct Creation," of "Teleological Relation," and of "Final Causes;" and those only who have known the firm hold which such views had over the public mind in past times can understand the almost unqualified approbation with which the reasoning on these questions in writings like the 'Bridgewater Treatises' (not to mention older books on natural theology) were received in their time, as well as the very opposite feelings excited by every work which presented a different view of the plan of creation.

On the Continent of Europe, it is true, some bold speculators, such as Goethe, Oken, Lamarck, and Geoffroy St.-Hilaire, had, in the end of the last and commencement of this century, broached the doctrine that there is in living beings a continuous series of gradations as well as a consistent and general plan of organization, and that the creation, therefore, or origin of the different forms of plants and animals must have been the result of a gradual process of development or of derivation one from another, the whole standing connected together in certain causal relations. But in Britain such views, though known and not altogether repulsive to a few, obtained little favour, and, by some strange process of reasoning, were looked upon by the great majority as little short of impious questionings of the supreme power of the Almighty.

How different is the position of matters in this respect in our day!—when the cautious naturalist receives and adopts with the greatest reserve the statement of fixed and permanent specific characters as belonging to the different forms of organized beings, and is fully persuaded of the constant tendency to variation which all species show even in the present condition of the earth, and of the still greater liability to change which must have existed in the earlier periods of its formation—when the belief prevails that, so far from being the direct product of distinct acts of creation, the various forms of plants and animals have been gradually evolved in a slow gradation of increasing complexity—and when it is recognized by a large majority of naturalists that the explanation of this wonderful relation of connection between previously existing and later forms is to be found in the constant tendency to variation during development and growth, and the perpetuation of such variations by hereditary transmission through successive generations in the long but incalculable lapse of the earth's natural mutations. These, as you must all be aware, are in their essential features the views now known as Darwinism, which were first simultaneously brought forward by Wallace and Darwin in 1858, and which, after being more fully elaborated in the works of the latter and ably supported by the former, secured, in the incredibly short space of ten or twelve years, the general approval of a large portion of the scientific world. The change of opinion is, in fact, now such that there are few scientific works on natural history, whether of a special or more general character, in which the relation which the facts of science bear to the newer doctrines is not carefully pointed out; that, with the general public too, the words "evolution" and "development" have ceased to excite the feelings, amounting almost to horror, which they at first produced in the minds of those to whom they were equally unfamiliar and suspicious; and that, even in popular literature and ephemeral effusions, direct or metaphorical illustrations are drawn in such terms of Darwinian theory as "struggle for existence," "natural selection," "survival of the fittest," "heredity," "atavism," and the like.

It cannot be doubted that in this country, as on the Continent, the influence of authority had much to do with the persistence of the older teleological views; and, as has been well remarked by Haeckel, one of the ablest and keenest supporters of the modern doctrine, the combined influence more especially of the opinions held by three of the greatest naturalists and biologists who have ever lived, viz., Linnæus, Haller, and Cuvier (men unsurpassed in the learning of their time, and the authors of important discoveries in a wide range of biological science), was decidedly adverse to the free current of speculative thought upon the more general doctrines of biology. And if it were warrantable to attribute so great a change of opinion as that to which I have adverted as occurring in my own time, to the influence of any single intellect, it must be admitted that it is justly due to the vast range and accuracy of his knowledge of scientific facts, the quick appreciation of their mutual interdependence, and, above all, the unexampled clearness and candour in statement of Charles Darwin.

But while we readily acknowledge the large share which Darwin has had in guiding scientific thought into the newer tracks of biological doctrine, we shall also be disposed to allow that the slow and difficult process of emancipation from the thraldom of dogmatic opinion in regard to a system of creation, and the adoption of large and independent views more consistent with observation, reason, philosophy, and religion, has only been possible under the effect of the general progress of scientific knowledge and the acquisition of sounder methods of applying its principles to the explanation of natural phenomena.

I have already referred to Goethe, Oken, Lamarck, and Geoffroy St.-Hilaire as among the most prominent of the earlier pioneers in the modern or reformed conceptions of biological laws. But were it desirable to mark the progress of opinion by quoting other authors and labourers whose contributions have mainly supplied the materials out of which the new fabric has been constructed, I should have to produce a long catalogue of distinguished names, among which would be found those of Lyell and Owen, as earliest shaping the doctrines and guiding opinion in this country, Johannes Müller and Von Baer, as taking the places of Haller and Cuvier on the Continent, and a host of other faithful workers in biology belonging to the earlier part of this century, such as those of G. Treviranus, J. F. Meckel, Carus, and many more.* To Huxley more especially and Herbert Spencer the greatest influence on British thought in the same direction is to be ascribed.

Let us hope that in these times, when it has been found necessary to modify the older teleological views to so great an extent, although there may still be much that is unknown, and wide differences of opinion in regard to the nature and sequence of natural phenomena and the mode of their interpretation, all naturalists will now concur in one important principle, viz., that truthful observation and candid judgment must alone be our guides in the interpretation of nature, and that that theory of creation is most deserving of our adoption which is most consistent with the whole body of facts carefully observed and compared.

To attempt to trace, within the limits to which my remarks must be confined, the influence which the progress of knowledge has exercised upon the scientific and general conception of biological doctrines would be impossible, for the modification of opinion on these subjects has proceeded not less from the rapid advance which our age has witnessed in the progress of general science, especially of physics and chemistry, than from hat of departments belonging to biology itself.

Thus, to go no further than the most general laws of nature, the whole doctrine of the conservation and transmutation of force in physics, so ably expounded to this Association by Mr. Justice Grove, the theory of compound radicals and substitution, with the discovery of organic synthesis, in chemistry, and the more recent advance in speculation with regard to the molecular constitution and properties of matter, with which we must associate the names of our last President and of Clerk Maxwell, in completely changing the aspect of physical and chemical sciences within the last thirty-five years, have paved the way for views of the constitution and action of organized bodies very different from those which could be formed at the time of the first Meeting of the Association in this place. And if, confining ourselves to the department of Biology, we add the discovery by microscopical observation of the minuter elementary forms of organization, more especially as flowing from the comprehensive views of organized structure promulgated by Schleiden and Schwann nearly forty years ago, the later discovery and investigation of living protoplasmic substances, the accumulated evidence of progressive types of animal and vegetable forms in the succession of superimposed strata composing the crust of the earth, the recent discoveries as to the conditions of life at great depths in the ocean, the vast body of knowledge brought together by the labours of anatomists and physiologists as to the structure and functions of almost every plant and animal, and (still more, perhaps, than any other single branch of biological inquiry) if we note the rapid and immense progress which has been made during the last fifty years in the study of the entirely modern science of the development of living beings, we shall be able to form some conception of the enormous extension in our time of the basis of observation and fact from which biological phenomena may now be surveyed, and from which just views may be formed as to their mutual relations and general nature.

It is now familiarly known that almost all (if not, indeed, all) the plants and animals existing on the earth's surface derive their origin from parents or previously existing beings whose form and nature they closely reproduce in their life's history. By far the greater number spring from germs in the form of visible and known spores, seeds, or eggs; a few may be traced to germs, or to vestiges of the parental body, the exact nature of which may be doubtful; and some, including even a certain number of those also produced from known germs, are either constantly or occasionally multiplied by budding, or by a process of cleavage or direct and visible division of the parent body.

The germ constituting the basis of new formation, whether it have the form of spore, seed, or ovum, is of the simplest kind of organization, and the process by which a new plant or animal is produced is necessarily one of gradual change and of advance from a simpler to a more complex form and structure: it is one of 'evolution' or, as I would rather name it, 'development.' But before proceeding to discuss the subject of development in the higher animals, it is right to advert to the preliminary and often debated question, which naturally presents itself, viz.:—Do all living or organized beings, without exception, spring from germs, or from any kind of organized matter that has belonged to parents? or may there not be some, especially among the simpler forms (with regard, indeed, to which alone there has of late been any question), which are produced by the direct combination of their component elements, in the way of the so-called spontaneous or equivocal generation, heterogenesis or abiogenesis?

The importance of the right solution of this problem is not confined merely to the discovery of the mode of origin of the lowly organisms which have been the more immediate object of investigation by naturalists in recent times, but is one of much wider significance, seeing that, if it shall be satisfactorily proved or even rendered probable that in the course of cosmical development all the various kinds of plants and animals have been gradually produced by evolution out of preexisting simpler forms,

* It would also be unjust to omit to mention here one of the earliest attempts to bring British opinion into a new channel, by the remarkable work entitled 'Vestiges of Creation,' which appeared in 1844, nor to conceal from ourselves the unmerited ridicule and obloquy attempted to be thrown upon the author, not perhaps so much on account of the many inaccuracies unavoidable in an attempt at the time to overtake so large a field, as directed against the dangerous tendencies supposed to lurk in its reasoning.

and thus the whole series of organized beings in nature has been shown to be one of hereditary connection and derivation, then it would follow that the history of the origin of the simplest organisms may be the key to that of the first commencement of life upon the earth's surface, and the explanation of the relation in which the whole succeeding progenies stand to their parental stocks.

From the very lucid and masterly view of this subject given by Professor Huxley in his Address to the Association at Liverpool, so recently as in 1870, in which the conclusion he formed was based very much on the exhaustive and admirable researches of Pasteur, I might also have dispensed with making further reference to it now, but for the very confident statements since made by the supporters of the doctrine of abiogenesis, among whom Dr. Bastian stands most prominent in this country, and for the circumstance that the life-history of many of the lower organisms was still imperfectly known.

During the last seven or eight years, however, renewed investigations by most competent inquirers have followed one another in quick succession, from a review of which we cannot but arrive at a conclusion adverse to the theory of heterogenesis, viz., that no development of organisms, even of the most simple kind, has been satisfactorily observed to occur in circumstances which entirely excluded the possibility of their being descended from germs, or equivalent formative particles, belonging to preexisting bodies of a similar kind. I can do no more now than name the authors of the most conclusive experiments on this subject, which I do nearly in the order of the publication of their researches, as those of Mr. W. N. Hartley in 1872, Messrs. Pode and Ray Lankester in 1873, Dr. Burdon Sanderson in that and the following years, Dr. W. Roberts in 1874, Professor Lister in 1875, and most recently of Professor Tyndall, Professor Cohn, and of Messrs. Dallinger and Drysdale.*

But, admitting that the evidence from direct experiment is such as entirely to shut us out from entertaining the view that spontaneous generation occurs in the present condition of the earth, we are not relieved from the difficulty of explaining how living organisms or their germs first made their appearance, nor are we debarred from attempting to form hypotheses as to how this may have taken place. First, upon the theory of evolution, which, strictly carried out, supposes the more complex organisms to be derived from the more simple, it might be held that the conditions affecting the combination of the primary elements of matter into organic forms may at one time have been different from those which now prevail, and that, under those different conditions, abiogenesis may have been possible, and may have operated to lay the foundations of organic life in the simpler forms in which it at first appeared—a state of things which can only be vaguely surmised, but in regard to which no exact information can be obtained. Or, secondly, evading the difficulty of strict cosmical evolution, we might suppose that vital conditions may have been coeval with the first existence of physical and chemical properties in the rest of natural bodies. But this hypothesis would be exposed to the objection that, according to the cosmical view generally held by physicists, the whole materials composing the earth have originally been subjected to incandescent heat. Nor is the difficulty abolished, but only removed to a more remote period, by the supposition of the transport of germs from another planet or their introduction by means of meteorites or meteoric dust; for, besides the objection arising from the circumstance that these bodies must have been subjected to a very high temperature, we should still have everything to learn as to the way in which the germs arose in the far distant regions of space from which they have been conveyed.

The incompleteness of the geological record leaves us in the dark as to the time at which the first dawnings of life appeared in the lower strata of the earth's surface. The most recent researches tend to carry the origin of life back to a much earlier period than was at one time believed, and (if the famous *Eozoon* be admitted as evidence) even into that of the Laurentian strata. But even if doubts should prevail with regard to the presence of definite organized forms in the older sedimentary strata, the occurrence in them of carbon in the form of graphite in large quantities makes the previous existence of living organisms at least possible, and it may be that the complete metamorphosis which these rocks have undergone has entirely removed all definite traces of organization.

Nor have we the means from geological data of determining whether the beings of the vegetable or of the animal kingdom first made their appearance. If we adopt the view which has for some time been entertained by physiologists that animals are entirely dependent, directly or indirectly, on plants for the material which constitutes their living substance, and that plants, as constructive agents, alone have the power to bring together the elements of lifeless matter, from such states as carbonic acid, water, and ammonia, into the condition of the living solid, the inference would be inevitable, at least for the great majority of the animal creation, that they must have been preceded by plants. But palæontology is as yet silent on this interesting question; and, if we consider the remarkable approach which is made in structure and properties between the lowest and simplest members of the two kingdoms of organic nature, so that at last all distinction between them seems entirely to vanish, and a set of organisms is found which partake equally of animal and vegetable characters, or, rather, exhibit properties which are common to them both, we shall hesitate to postulate confidently for the primitive antecedence of vegetable life, although, perhaps, in later epochs the preexistence of vegetables may be looked upon as necessary to the life of more developed animal organisms.

The reflection forces itself upon us that we are just as ignorant of the mode of first origin of all the compounds of the inorganic elements as we are of that of living matter; and we may therefore be excused if we suspend all theory and conjecture until we shall be guided to more reliable hypotheses through the plain track of observation and experiment.

The practical applications of the increased knowledge of the origin of minute animal and vegetable organisms are so numerous that it would occupy a much longer

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* I may refer to Dr. Bastian's paper in *Nature*, of June 30, 1870, and to his two works, 'The Origin of the Lowest Organisms,' and 'The Beginnings of Life,' and papers to Roy. Soc. 1873. Mr. Hartley's researches, which were commenced in 1865, are described in a paper printed in the 'Proceedings of the Royal Society,' for 1872, and in his 'Lectures on Air,' 2nd edition, 1876, where an interesting account of the whole subject will be found. The experiments of Mr. Pode, of Oxford, and Professor Ray Lankester are described in a paper on the 'Development of *Bacteria* in Organic Infusions,' in the 'Roy. Soc. Proc.', 1873, vol. xxi., p. 349. Dr. Burdon Sanderson's researches are contained in the Reports of the Medical Officer of the Privy Council, and in various papers in *Nature*; Dr. W. Roberts's paper is printed in the 'Transactions of the Royal Society.' for 1874, vol. clxiv., p. 457. Professor Lister's 'Contribution to the Germ Theory of Putrefaction and other Fermentative Changes,' etc., is contained in the 'Transactions of the Royal Society of Edinburgh,' for 1875, p. 313, and is also given in *Nature*. Professor Tyndall's researches are described in his papers in the 'Proceedings of the Royal Society' during the last two years. The work of Professor Cohn, of Breslau, entitled 'Beiträge zur Biologie der Pflanzen,' 1873-76, contains many memoirs bearing upon this subject, which have been partly published in abstract in the *Microscopical Journal*, in which also will be found, in a series of contributions extending from 1873 to the present time, the interesting observations of Mr. W. H. Dallinger and Dr. J. Drysdale.

time than is at my disposal to give any detailed account of them; but they are of such immense importance in their commercial, social, and sanitary relations that they ought never to be lost sight of.

It is now proved beyond doubt that the origin of putrefaction and fermentation is dependent on the presence in the substances which are the seat of change in these processes, or in the surrounding air, of the germs of minute organisms of an animal or vegetable nature, and that the maintenance of the chemical changes in which these processes mainly consist is coincident with and casually (if not essentially) dependent upon the growth and multiplication of these organisms.

Professor Lister had the merit of being the first to apply the germ theory of putrefaction to explain the formation of putrid matters in the living body; and he has founded on this theory the now well-known antiseptic treatment of wounds, the importance of which it would be difficult to overestimate.

The success or failure of plans for the preservation of meat and other articles of food without question depends on the possibility of the complete exclusion of the germs which are the cause of putrefaction and fermentation; and their management must therefore be founded on the most accurate knowledge of these organisms, and the circumstances influencing the persistance of their vitality and the vigour of their growth.

The theory of biogenesis has also lately been the guide in the investigation of the causes of various forms of disease, both in the lower animals and in man, with the result of showing that in many of them the infective substance consists, in all probability, of germs of minute animal or vegetable organisms.

There is very great probability, indeed, that all the zymotic diseases (by which we understand the various forms of fevers) have a similar origin. As has been well remarked by Baxter in an able paper on 'The Action of Disinfectants,' the analogies of action of contagia are similar to those of septic organisms, not to processes simply of oxidation or deoxidation. These organisms, studied in suitable fluids, multiply indefinitely when introduced in all but infinitesimal proportions. Thus they are, as near as we can perceive, the very essence of contagia.*

Leaving, however, these and many other general questions regarding the origin of the lowest forms of animal and vegetable life, let us now turn our attention to the mode of development of a new being in those belonging to the higher groups. The general nature of the formative process, in all instances where fertilized germs are produced, will be best understood by a short sketch of the phenomena ascertained to occur in different kinds of plants.

In the higher or phanerogamic plants it is generally well known that the combination of two parts of the flower is necessary to the production of a seed containing the embryo or young plant. Beginning with the discovery of the pollen-tubes by Amici in 1823, the careful and minute investigations of a long line of illustrious vegetable physiologists have brought to light the details of the process by which fertilization is effected, and have shown, in fact, how the minute tube developed from the inner membrane of the pollen-granule, as soon as it falls upon the stigmatic tissue of the seed-bearing plant, insinuates itself by a rapid process of development between the cells of the style, and reaches at last the ovule, in the interior of which is the embryo-sac; how, having passed into the micropyle or orifice of the ovule, it makes its way to the embryo-sac; how a minute portion of the fertilizing substance of the fovilla transudes from the pollen-tube into the cavity of the embryo-sac, in which by this time a certain portion of the protoplasm has become differentiated into the germinal vesicle—thereby stimulating it to further growth and development, the earliest phenomena of which manifest themselves by the formation of an investing cell-wall, and by the occurrence of cell-division which results in the formation of the embryo or plantule of the seed.

Thus it appears that the essential part of the process of production in phanerogamic plants is the formation in the parent plant of cells of two different kinds, which by themselves have little or no independent power of further growth, but which, by their union, give rise to a product in which the power of development is raised to the highest degree.

By further researches it is now known that the same law prevails in all the remaining members of the vegetable kingdom, with the exception only of the very simplest forms.*

In viewing the reproductive process in the series of cryptogamic plants, two facts at once strike us as remarkable in the modifications which are observed to accompany the formation of a productive germ, viz. :—first, that the difference between the two productive elements becomes as it were more prominent, or more highly specialized, in the cryptogamic than in the phanerogamic plants; and second, that in the simpler and lower forms this difference gradually disappears till it is lost in complete uniformity of the productive elements.

Thus in the whole tribe of the Ferns and Cryptogams, in the higher Algæ and Fungi, in the Characeæ and in the Mosses, the differentiation of the productive elements is carried to a very high degree; for while that belonging to the embryo or germ presents the structure of a simple cell which remains at rest, or in a comparatively passive state, and, absorbing into itself the substance of the other, becomes the seat of subsequent development, the other, corresponding to the pollen of the staminiferous phanerogam, is usually separated from the place of its formation, and, having undergone a peculiar modification of structure by which it acquires active moving cilia, it changes place and is directed towards the germinal structure, and, coming in contact with its elementary cell, is more or less absorbed or lost in the fertilizing process. The protoplasm of the germinal cell thus acted on and fertilized then proceeds to undergo the changes of development by which the foundation is laid for the new plant.

In the Algæ and Fungi, however, there are gradations of the differentiation of the two reproductive cells which are of the greatest interest in leading to a comprehension of the general nature of the formative process. For in the lower and simpler forms of these plants, such as the Desmidieæ, Mesocarpeæ, and other Conjugatæ, we find that there is no distinction in structure or form to be perceived between the two cells which unite or undergo conjugation; and a complete fusion or intermixture of the two masses of protoplasm results in the production of a single, usually spherical, mass holding the place of an embryo. And that there is an absence of specialization between the two uniting cells is clearly shown, in both *Desmidium* and *Mesocarpus*, by the fact that the embryo or zygospore is formed in the mass resulting from the union of the protuded portions of the two cells; and in more ordinary cases, as in *Spirogyra*, where the embryo is formed in one of the two cells, it seems to be indifferent in which of them it is formed.

From this, which may be regarded as the most elementary type of new production by the union of the two cells, the transition is not a great one to the development of a progeny without any such union. We might conjecture, then, that the capacity for separate or individual existence extends in the lowest organisms to the

* For the most interesting information on this subject, I cannot do better than refer to the very able Reports by Dr. Burdon Sanderson in the 'Reports of the Medical Officer of the Privy Council,' 1873, 1874, and 1875.

* It will be observed that I leave entirely out of view the whole subject of the multiplication of plants by budding or simple division.

whole or to each structural element of their organization, while as we rise in the scale of vegetable life (and the same view might apply to the animal kingdom) this capacity is more and more divided between the two productive elements, or at least, is only called into full action by their combination.

The germinal element consists of a simple primordial cell, varying in different kinds of plants, but in all of them probably containing the essential substance protoplasm; and the most immediate result or effect of fertilization is the multiplication by repeated fissiparous division of the previously existing cells. The new individual resulting from this cellular growth usually remains within the parent body, without, however, direct union or continuity of tissue, till the embryo has attained some advancement, as in the well-known case of the seeds of a phanerogam; but there are many varieties in the mode of its disposal among the lower plants.

A remarkable exception to the more direct relation of the process of fertilization to the formation of the new individual or embryo occurs in some plants, simulating in some respects that kind of variation in animal reproduction which has been named alternate generation. A well-known instance of this belongs to the Vascular Cryptogams. The prothallium of the Ferns, for example, results from the development of so-called spores or unicellular buds, which are familiar as being formed in small capsules on the lower leaf-surface; and in this prothallium, when it has reached a certain stage of vegetation, there are formed the archegonia, containing the oospheres or germ-cells, which are fertilized by the moving ciliated particles developed in the cells of the antheridia, leading to the production of a new spore-bearing plant.

Recent researches have also called attention to the remarkable arrangements in phaneroganic plants for the prevention of fertilization of the pistils by pollen from the same flower, or even from the same plant. In the latter case this is effected by the separation of stamens and pistils in different flowers on the same or on different plants. In the former case, where both organs occur in the same flower, the adaptations, whether of a mechanical or of a physiological character, by which self-fertilization is prevented, as ascertained by numerous recent investigations (among which those of Darwin are most conspicuous), are of the most varied and often the most complicated kind.

Let us now turn to the consideration of the Development of Animals; and let me say in the outset that it will be necessary for me to confine my remarks chiefly to the higher or vertebrated animals, and to certain parts only of the history of their development—more particularly the structure and formation of the ovum or egg, its earlier developmental changes, and the relation of these to the formation of the new animal.

I cannot enter upon the consideration of this topic without adverting to the very recent acquisition of some of the most important facts upon which this branch of knowledge is founded; and I feel it to be peculiarly appropriate, in the year of his death, to refer to a biologist whose labours contributed more powerfully than those of any other person to give to animal embryology the character of a systematic branch of science, and to whom we owe some most important original discoveries—I mean Karl Ernest von Baer, of Königsberg, St. Petersburg, and Dorpat.

Of observers who, previous to Von Baer, were mainly instrumental in preparing the way for the creation of a more exact modern science of embryology only two can be mentioned, viz., Caspar Frederick Wolf, of St. Petersburg, well know as the author of a work entitled 'Theoria Generationis,' published in 1759, by which the *epigenesis* or actual formation of the organs in a new being was first demonstrated, and Christian Pander, who, by his researches made at Würzburg, explained, in a work published in 1817, the principal changes by which the embryo arises and is formed.

Von Baer was born in the Russian province of Esthonia on the 29th of February, 1792. After having been fifteen years professor in the Prussian University of Königsberg, he was called to St. Petersburg, and having some years later been appointed to a newly established professorship of comparative anatomy and physiology, he remained in that city for nearly thirty years as the most zealous and able promoter of scientific education and research, stimulating and guiding all around him by his unexampled activity, comprehensive and original views, sound judgment, and cordial cooperation. In 1868, at the age of 76, he retired to Dorpat, from the university of which he had received his degree in 1814, and continued still to occupy himself with working and writing in his favourite subjects, as well as interesting himself in every thing that was related to educational and scientific progress, to very near the time of his death, which occurred on the 28th of November, 1876, in his 85th year.

Although Von Baer's researches, according to the light in which we may now view them, contributed in no small degree to the introduction of the newer views of the morphological relations of organic structure which have culminated in the theory of descent, yet he was unwilling to adopt the views of Darwin; and one of his latest writings, completed in the last year of his life, was in vigorous opposition to that doctrine.

It would have been most interesting and instructive to trace the history of the progress of discovery in embryology from the period of Von Baer down to the present time; but such a history would not be suitable to the purpose of this address; and I can only venture here, in addition to Rathke, the colleague of Baer in Königsberg, to select two names out of the long list of distinguished workers in this field during the last forty years, viz.:—Thomas Bischoff, of Giessen and Munich, to whom we owe the greatest progress in the knowledge of the development of mammals, by his several memoirs, appearing from 1842 to 1854; and Robert Remak, of Berlin, whose researches on the development of birds and batrachia, appearing from 1850 to 1855, gave greatly increased exactness and extension to the general study of development.

The germinal element from which, when fertilized, the new animal is derived is contained within the animal ovum or egg—a compact and definite mass of organic matter, in which, notwithstanding great apparent variations, there is maintained throughout all the members of the animal kingdom, excepting the protozoa, which are destitute of true ova, a greater uniformity in some respects than belongs to the germinal product of plants.

Usually more or less spherical in form, the animal ovum presents the essential characters of a "complete cell," in the signification given by Schwann to that term. The germinal substance is enclosed by an external vesicular membrane or *cell-wall.* Within this covering the *cell-substance* (generally named yolk or vitellus, from the analogy of the fowl's egg) consists, to a greater or less extent, of a mass of protoplasm; and imbedded in this mass, in a determinate situation, there is found a smaller internal vesicular body, the *germinal vesicle* or nucleus, with its more or less constant or variable *macula* or nucleolus.

Now the first thing which strikes us as remarkable connected with the ovum is the very great variation in size as compared with the entire animal, while in all of them the same simple or elementary structure is maintained. The ovum of mammals is, for example, a comparatively small body, of which the average diameter is about $\frac{1}{150}$ of an inch, and which consequently scarcely weighs more than a very minute fraction of a grain, which may be calculated perhaps only at the $\frac{1}{12000}$ part. And further, in two animals differing so widely in size as the elephant and the mouse, the weights of which may be held to stand towards each other in the proportion of 150,000 to 1, there is scarcely any difference in the size of the mature ovum.

On the other hand, if we compare this small ovum of the mammal with the yolk of the egg in the common fowl the part to which it most nearly corresponds, it may be estimated that the latter body would contain above three millions of the smaller ova of a mammal.

The attribute of size, however, in natural objects ceases to excite feelings of wonder or surprise as our knowledge of them increases, whether that be by familiar observation or by more scientific research. We need not, at all events, on account of the apparent minuteness of the ovum of the mammifer or of any other animal, have any doubts as to the presence of a sufficient amount of germinal substance for explaining in the most materialistic fashion the transmission of the organic and other properties and resemblances between the parent and offspring. For we are led to believe, by those who have recently given their attention to the size of molecules composing both living and dead matter, that in such a body as this minute ovum of the mammal there may be as many as five thousand billions of molecules; and even if we restrict ourselves to the smaller germinal vesicle, and, indeed. to the smallest germinal particle which might be made visible by the highest microscopic enlargement, there are still sufficient molecules for all the requirements of the most exacting material biologist.*

This great disparity of size, however, is connected with an important difference in the disposition of the yolk-substance, according to which ova may be distinguished as of two kinds—the large- and the small-yolked ova, between which there are also many intermediate gradations. The larger-yolked ova belong to the whole tribe of birds, scaly reptiles, osseous and cartilaginous fishes, and the Cephalopods among the Invertebrates; and are distinguished by the strictly germinal part or protoplasm being collected into a small disk, known familiarly as the cicatricula of the fowl's egg, and to be seen as a whitish spot on that side of the yolk which naturally floats uppermost, while the rest of the yolk, of a deeper yellow colour, contains a large quantity of vitelline granules or globules of a different chemical nature from the protoplasm.

The phenomena of embryonic development are, in the first instance at least, confined to the germinal disk, and the rest of the yolk serves in a secondary or more remote manner to furnish materials for nourishment of the embryo and its accessory parts. Thus we distinguish the germinal from the nutritive or food-yolk, or, as the younger Van Beneden has named them, the *protoplasm* and the *deutoplasm*.

In the smaller ovum of the mammal, on the other hand, it seems as if the whole, or nearly the whole, of the yolk were protoplasmic or germinal. There may be some admixture of yolk-granules; but there is not the marked separation or limitation of the protoplasmic substance which is so distinct in birds, and the earliest changes of development extend to the whole component substance of the yolk, or, in other words, the yolk is entirely germinal. Hence some have given the names of *meroblastic* and *holoblastic* (meaning partially and entirely germinal) to these two contrasting forms of ova. There are many of the invertebrate animals of which the ova present the same entirely germinal arrangement as in those of mammals, and the *Amphioxus* may be included in the same group.

The Amphibia stand in some measure between the two extremes—the purely protoplasmic or germinal part occupying one side, and the nutritive or vitelline the other. But among the Invertebrates the gradations are often such as to make it difficult to determine under which group the ova should be placed.

The genesis or formation of the ovum itself, if it be considered with reference to its first origin, carries us back to a very early period of the formation of the parent in which it is produced; and it is one of the most interesting problems to determine what is the source of the cells in the parent from which the ova originally spring. All that I can venture to say at present in regard to this point is, that the primordial ova or germs appear in the parental body, while still embryonic, at a very early period of its development, and clearly derive their origin from a deeply-seated part of the formative cells which are undergoing transformation into the primitive organs; but the exact seat of the origin of the reproductive cells is still a matter of doubt.

When the ovum attains its full maturity in the ovary, the seat of its formation within the parent, it is separated from that organ, and when perfected proceeds to undergo embryonic development, a marked difference in this respect existing between the germinal product of the higher plants and animals.

The period of maturation of the ovum is marked in the greater number of animals by a series of phenomena which have generally been interpreted as the extrusion or absorption of the germinal vesicle; and various observers have actually traced the steps of the process by which that vesicle appears to leave the yolk and is lost to sight, or has passed into the space between the yolk and its membrane in the shape of the peculiar hyaline bodies named the *polar* or *directing* globules. But recent researches, afterwards to be referred to, tend to show that some part at least of the substance of the germinal vesicle remains to form, when combined with the fertilizing element, the newly endowed basis of future development.

(*To be continued*).

* According to a calculation made by Mr. Sorby, the number of molecules in the germinal vesicle of the mammalian ovum is such that if one molecule were to be lost in every second of time, the whole would not be exhausted in seventeen years. See the Address to the Microscopic Society, in *Journal of Microscopic Science*, vol. xv., p. 225, and *Nature*, vol. xiii., p. 332. See also Darwin on 'Pangenesis,' in his work on 'Variations,' etc. (1868), vol. ii., p. 374, and the Review by Ray Lankester of Haeckel's work, 'Perigenesis der Blastidule,' etc., in *Nature* for 1876, p. 205, and Ray Lankester's essay on 'Comparative Longevity,' 1870.

BOOKS, PAMPHLETS, ETC., RECEIVED.

A Treatise on Chemistry. By H. E. Roscoe, F.R.S., and C. Schorlemmer, F.R.S. Vol. I. The Non-Metallic Elements. London: Macmillan and Co. 1877. From the Publishers.

Études sur la Bière, ses Malades, Causes qui les provoquent, Procédé pour la rendre inalterable, avec une Théorie nouvelle de la Fermentation. Par M. L. Pasteur. Paris: Gauthier-Villars. 1876. From the Publishers.

Obituary.

JOHN HUSKISSON.

John Huskisson, the late father of the chemical trade, was born on Christmas Day, 1789, at the Old Bath House, Cold Bath Fields, his father's residence. In the adjoining neighbourhood his father, Samuel Huskisson, in conjunction with his brother, Thomas Huskisson, and uncle, George Towers, were carrying on the business of manufacturing chemists, being a continuation of that first founded in the latter half of the seventeenth century by Dr. Samuel Towers, their direct lineal ancestor, in Oxford Street, or Oxford Road, as it was then called. Previous to this the apothecaries of that day, the precursors of the present race of chemists and druggists, were accustomed to prepare their chemicals on the leads of their houses, and it was Dr. Towers who was the first to carry out the idea of establishing a laboratory to manufacture chemicals for them.

John Huskisson was educated at Enfield, at the school of

Dr. Clarke, whose son, Charles Cowden Clarke, the writer, afterwards became his relative by marriage. John Keats, the poet, was his schoolfellow, and when Keats came to London to study medicine at St. Thomas's Hospital, he spent many pleasant evenings in the laboratory in Little Warner Street. Upon leaving school his father, anxious that before he entered the chemical trade he should have a good commercial education, placed him for a few years with Messrs. Green, the eminent merchants of the City of London, and it was there that he acquired those strict habits of business, which always distinguished him. His father separated from his partners, and went into business by himself in Swinton Street, at the commencement of the present century, where in 1811 his son joined him, the firm being then Samuel Huskisson and Son, from which time until January 1861 (when he retired) he was actively engaged in the business, which he then left to his brother and his nephews, one of whom still carries it on. He died at his residence, Colonnade House, Upper Holloway, on the 24th July last, in his 88th year.

He was a member of the Pharmaceutical Society from the commencement, and though never taking any office otherwise than once being auditor, in the troubled times of the Society many disputed points were settled by him when surrounded by his friends of both sides under the old cedar tree in his garden.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Counter Practice.

Sir,—The burning question of "Chemists' Prescribing," has derived an accession of heat from the recent systematic enforcement of a statute supposed to be levelled against the practice. Whether this be persecution or not matters little, but it is of absorbing interest that a question which concerns the peace of pharmaceutists and the convenience of the public should be removed from the realms of hazy legislation, and that it should be clearly established, whether the liberty of the subject is to be subordinated to the jealousies of the two departments of medicine.

It is not a question which may be left to look after itself in an unequal contest between a powerful organization and individual offenders (?). The Pharmaceutical Society owes it to its members to take up the cudgels in their behalf, and to propound the general aspect of the case in a manner unattainable by an individual tainted with the imputation of breaking the law. It is satisfactory to see that the Council have thrown off their usual (and commendable) reserve, and have "authorized their solicitor, at his discretion, and at the expense of the Society to defend the gentlemen referred to, in the threatened prosecution by the Apothecaries' Company." Further, it appears likely that in October next, the Council may be invited to consider a more important proposition in the form of a motion, "that the Council communicate with the Apothecaries' Company, and endeavour to arrive at some amicable arrangement as to the limits which should be laid down as unobjectionable." Let the Council beware of the fundamental error which lurks in such an "arrangement," and let them avoid action which acknowledges the dependence of the pharmaceutical body upon any other corporation, medical or non-medical.

Pharmacy holds and must maintain an equal position under the laws of the country with any of those bodies.

The onslaught upon certain pharmaceutists, who in all probability are not more criminal than their neighbours, is obviously dictated by anxiety on the part of its promoters for the extension of their fees. It must be acknowledged that the attack has been resented in a similar spirit, and that troubled pharmaceutists have exclaimed with Demetrius of old, "Our craft is in danger." We may discuss both considerations as outside the record, but we must not forget that a third party is involved whose liberty and convenience is directly assailed, and whose power is omnipotent.

Is there any doubt of the utter inability of the medical profession to grapple with the innumerable demands made by the public upon the ever accessible pharmaceutist?* Is there any doubt that the pharmaceutist supplies a real want with considerable success? Or does any one believe that the public would tolerate the withdrawal of this accommodation if there was any possibility of putting the proposed prohibition into actual operation?

The real grievance is that while chemists are compelled, often unwillingly, to give advice in minor ailments; while the public will have it or be "highly offended" (even in such grades as resort to the pharmacy of a respected member of the Council in the West End of London) they do so with a halter round their necks, giving their best services and making no charge. I wonder if there is a single Judge upon the Bench, Baron Bramwell included, who has not provoked the act which he rules to be contrary to law!

I will raise no false issues; the whole purpose of my letter is to remove this question to its rightful position as one of public necessity, for which if the law does not now provide it must be made to provide. I will not dwell as I easily might upon the qualifications of those "assistants accustomed to prescribing but not duly qualified," for whom medical practitioners advertize, and whom they presumably employ—nor will I enlarge upon the character of the advice and remedies meted out to the Working Men's Clubs contracted for at 2*d* per head. It is not upon the platform of trades-unionism that the real issue must be decided. Rather let me indicate in a few words the course which in my judgment should be taken.

I have already said that no attempt should be made to settle by compromise the interests of two parties in a question in which *three* are concerned, the third more materially than the other two; but an arrangement might be made to test the present state of the law by a typical case, fairly representing the every day experience of an average pharmacist—and let it be understood that if this goes against us, we shall agitate for the repeal of the law as antagonistic to public necessity.

Let some *bonâ fide* customer, who is determined not to spend a series of half guineas which perhaps he can ill afford, apply to his accustomed chemist for medicine for his children suffering from a prevailing epidemic; let the chemist fill up the measure of his iniquity by actually inspecting the child, and diagnosing "Whooping Cough," and let him furnish one of those remedies with which every experienced *nurse* is familiar. Let such a case be tried upon even terms, that is to say, with the authority of the Pharmaceutical Society upon the one side, against the Society of Apothecaries upon the other. And let our Society stand to its guns without flinching, instead of damning their case from the outset with faint encouragement. Then shall we know either that such a transaction as any man, woman, or midwife might perform with impunity, is in the eye of the law innocent when done with the greater experience of a pharmaceutist, or, that the laws of England condemn the perpetrator of this enormity to a fine of £...(I don't know whether the judge has the power to send a hardened offender to goal), and by consequence that it condemns paterfamilias to a fine of indefinite amount in fees which middle class families do not now think it necessary to incur.

In the latter event it would be the duty of the Society to take action for obtaining the repeal of a law which cannot possibly be enforced, because it is antagonistic to the habits, instincts, and convenience of the people; and we should be thankful to those whose ill-advised zeal to sketch the limits of an oppressive statute has led to its abrogation.

One who has fallen out of the Ranks.

W. Bradshaw, F. C. Clayton, T. Fore, and Spes.—Your communications should have been sent to the publishers.

Communications, Letters, etc., have been received from Messrs. Hoddinott, Barry, Whitelaw, Baildon, J. B. L. Mackay, Welborn, Gardner, Dr. A. S. Taylor, Ph. Chemist, An Associate, Devonian, Juvenis, Young Associate in Business, A Jersey Chemist, H. P., G. W., M. B., W. T., G., J. B., W., J. G., T. T. B.

We are compelled from want of space to defer publication of several communications.

* Are they not at the present moment rebelling vehemently against the alleged abuse of the medical charities, although these constitute their chief means of meeting that class of cases which resort to the chemist for advice?

"THE MONTH."

August is preeminently the harvest time of the year, and it is not less so for the dealer in medicinal plants than for the agriculturist. Many of the plants which have been in blossom during the past two months are now in their full maturity and will soon fall beneath the sickle and find their way into the insatiable evaporating pan or gigantic still. In various districts around London the air is already scented with the perfume of the lavender, marjoram, savory, thyme, balm and mint, and many other sweet herbs. Even in the great metropolis the passer by is every now and then saluted by a whiff of delicate odour from the stock in trade of some itinerant lavender seller. Soon, too, the undulating hills of Kent and Surrey will present a scene of intense activity and bustle and the air will be redolent of the powerful aroma of the hop, whose elegant festoons of fruit will grace many a cottage parlour for months to come.

Scarcely more than four hundred years ago the hop was called an unwholesome and wicked weed, and parliament was petitioned against its use as an ingredient in beer. But times and tastes have altered, and the immense warehouses in the neighbourhood of Southwark Street bear witness to the favour with which the hop is now universally received and to the enormous quantity which is consumed every year.

The plant itself is interesting from a botanical point of view. The pistillate or female plant is alone propagated by hop growers, and as the plant is diœcious it would, at first sight, appear impossible that the plant should produce fruit without the proximity of male plants. Singularly enough, under these circumstances the plants become to a certain extent monœcious and produce sufficient staminate flowers to fertilize the pistillate ones. The former are arranged in loose panicled cymes arising from the axils of the upper leaves. Each flower has five linear obtuse sepals and five stamens scarcely exceeding the calyx, the anthers are rather long, and the filaments very short and slender. The pistillate flowers consist of small dense catkins arranged either simply or in a panicled manner in the axils of the upper leaves. Each catkin consists of concave membranous bracts (which afterwards enlarge and form the strobile), each of which has a single ovary enclosed in a sepal at its base. The sepal is covered with minute glands, which when separated from the hops by sifting form the lupulin of commerce. For the sake of uniformity it would be better that this name should be kept for the bitter principle of the hop, and lupulite (a term which is sometimes given to the bitter principle) reserved for the glands. This arrangement has been followed in Sowerby's 'Botany,' and is worthy of being followed in works on materia medica.

The chamomile (*Anthemis nobilis*, L.), which was briefly alluded to in June, is now in full maturity, and may be found abundantly on grassy commons; even so near London as Clapham Common it may be found in plenty. The creeping habit and strong odour of the plant at once distinguishes it from the many other plants which have flowers similar in appearance. Only the flowering stalks are erect, and these usually bear only one blossom, although the flowering axis is sometimes branched below, and then bears two or even three flowers. The flower, or more properly flower-head (capitulum), consists of an outer ring of bracts (phyllaries) surrounding a number of florets. If these florets are pulled off there will be found other membranous bracts (paleæ) between each of the florets. When the paleæ are removed the solid conical receptacle will come into view. It will be remembered that the shape and consistence of the receptacle and the presence of paleæ distinguish this plant from the *Matricaria Chamomilla*, L. Upon careful examination with a lens, it will be found that the outer white ligulate florets (florets of the ray) have only a pistil and forked stigma, while the yellow tubular florets in the centre (florets of the disk) have a regular corolla with five teeth, and five united (syngenesious) anthers surrounding the pistil. The florets open from the circumference towards the centre (centripetally) of the flower-head. The florets of the ray, having no pollen to produce, are enabled to enlarge the corolla and thus render the flower conspicuous, and thereby attract insects. Under cultivation this property is increased, and many double composite flowers, such as the dahlia and chrysanthemum, are formed by the development of the corollas of the central florets at the expense of the stamens. The same thing happens in the double chamomile. It may be here remarked that the single chamomiles of commerce are almost always more or less "double," and can practically only be distinguished by the presence of a very few yellow florets in the centre and by the florets being narrower than in the flowers which are called double in trade.

The way in which the pollen is discharged from the tube formed by the united anthers is very curious. The style is at first shorter than the anthers, and its two stigmas are folded together so closely that the style does not appear to have any. By the growth of the style the pollen is pushed before it out of the top of the anther tube. The stigmas then protrude beyond the corolla, and separate so as to expose their sticky surface. The florets are therefore incapable of fertilizing their own stigmas. The two stigmas are best seen by examining a floret near the circumference first, and then comparing it with a central unopened one.

The wormwood (*Artemisia Absinthium*, L.) although not now official, is too widely known and used to pass altogether unnoticed. It cannot be called a very common plant in this country, although widely distributed and often very abundant where it occurs. In the neighbourhood of old villages in hilly districts, it may occasionally be found, and is easily recognized by its powerful odour and hoary, finely cut leaves. The small greenish yellow flower heads are arranged in erect rather leafy panicles. The florets are all tubular, and the outer row contains only pistils. The phyllaries are in two rows, the outer linear and silky, the inner rounded and membranous. Like *Matricaria*, *Tanacetum*, and *Anthemis*, the plants of this genus are without pappus. The ash of the plant contains a considerable quantity of carbonate of potassium, hence the origin of the name of salt of wormwood. Another species, very common in hedges, *Artemisia vulgaris*, or mugwort, is often used for fomentations in some parts parts of England. The flowers are very similar in general appearance, but the leaves are white on the under surface only, the upper being dark green.

The golden yellow heads of the tansy (*Tanacetum vulgare*, L.), with its elegant fern-like leaves, may now be seen adorning the hedgerows or damp wayside. The leaves are bipinnatifid and serrate, and the flower-heads have no ligulate florets, although the outer row of florets consists of pistillate flowers only. The odour of the plants is strong and camphoraceous. It is said to possess stomachic and anthelmintic properties.

Several other plants belonging to the compositæ are now in blossom. The burdock (*Arctium majus*, Schk.), of which the seeds were formerly official, and the roots are still highly esteemed in many of the provinces for their alterative properties. The plant owes its name to the burrs or flower-heads armed with hooked phyllaries which cause them to adhere to the passer by. This plant is cultivated in Japan as a vegetable, under the name of Gobo.

Yarrow (*Achillea Millefolium*, L.) was anciently much prized as a vulnerary and astringent, and sometimes called "nosebleed," because its leaves put into the nose caused it to bleed. The flowers are very likely to puzzle the tyro in botany, on account of the flower-heads being very small, and the florets of the ray being only five in number; examination with a lens will, however, at once reveal that what appear to be stamens are perfect flowers.

The Canadian fleabane (*Erigeron Canadense*, L.), is not uncommon in the neighbourhood of London, where it has become to some extent naturalized since 1690. The flower-heads look something like those of the wormwood, but the leaves are linear and green and the plant is much smaller. The volatile oil is used in America for hæmorrhages and the infusion as an astringent and diuretic.

The feverfew (*Matricaria Parthenium*, L.) is chiefly of interest to the pharmaceutist on account of the flower-heads having been once found in commerce intermixed with chamomiles, from which they are distinguished readily by the flattened receptacle. The plant has a disagreeable camphoraceous odour recalling that of tansy, from which it is easily known by having white ligulate florets and by the lighter coloured, less divided leaves. Although occasionally found wild it is probably not truly indigenous, but an escape from cottage gardens, in which it is a great favourite. In the West of England it is known under the name of feather foil, and an infusion is used as a fomentation. The pretty plant with yellowish green pinnatifid leaves now used so extensively in flower borders is a variety of the feverfew.

The annual henbane is now in full blossom and is easily distinguished from the biennial plant by the paler colour of its less deeply divided leaves and by the long straggling branches bearing the flowers. The leafy bracts subtending the flowers are usually placed regularly in a two ranked manner, and the flowering axis has considerable resemblance to the scorpioid cyme of a forget-me-not (*Myosotis*). Practical pharmacists should not forget that the tincture of this plant does not show a milkiness when mixed with water, as that made from the biennial does, nor that the preparation made from the two kinds can be distinguished, as shown by Stoddart, by means of the spectroscope.

The handsome foliage of the tutsan (*Hypericum androsæmum*), with its yellowish flowers and red or blackish berries, may now be seen here and there on shady hedge banks and in bushy places. This plant was formerly much esteemed as a vulnerary, as indicated by its corrupted French name, meaning heal-all The bruised leaves of this and other species of hypericum are still used in country districts with some success in healing ulcerated legs, etc.

In the various botanical gardens most of the plants described in June and July are still in blossom. Among those not before noticed are the following:—

Rue (*Ruta graveolens*, L.), although not much used in this country at the present day, was formerly very highly esteemed. The leaves are tripinnate and the leaflets somewhat obovate in outline and marked with transparent dots (oil glands) like most of the plants of this family. The corolla consists of four serrate yellowish petals, hooded at the end. The stamens are eight in number, four being opposite, and four alternate with the petals. In the bud these petals are folded in a rather curious way, one petal being overlapped by two lateral ones, which are again overlapped by the fourth, so that the æstivation somewhat resembles that of the papilioneæ. In the first or inner petal three stamens are enclosed, in the lateral petals two stamens in each, and in the fourth or outer petal only one stamen. When the flower is expanded, four stamens, alternate with the petals, mature first, and raise themselves one by one until the anther stands over the stigma, afterwards returning to their original position on a level with the petals.

The lavender (*Lavandula vera*, D.C.) is now in full perfection. The fragrant blue flowers are arranged in axillary cymes (verticillasters), most of which are so close together as to form an interrupted spike. The floral leaves or outer bracts are rhomboidal and tapering, of a brown colour; those under each flower much smaller and narrower, but of the same colour. The calyx is nearly cylindrical and ribbed, with many veins, but is only furnished with one small tooth which may be seen at the back of the flower; the corolla is two-lipped and of a deeper tint on its inner surface than on its outer. The lower verticillasters are often somewhat widely separated. In the *Lavandula spica*, L., which yields the oil of spike, there are very few characters by which it can be distinguished from *L. vera*. It has, however, a denser habit and whiter aspect, and the spike is shorter and less interrupted; and it is more susceptible of cold, extending less far north than *L. vera*. As cultivated in botanical gardens in this country, its odour is scarcely to be distinguished from that of *L. vera*, and the inferiority of the oil of spike, or essence d'aspic, is probably caused by the use of the whole plant in distillation. The different varieties of tobacco are now in full flower; the stramonium is showing its prickly capsules, and the belladonna its purplish blackberry like fruits. The bladder senna (*Colutea arborescens*, L.), the leaves of which were at one time found in senna on the continent, is now very conspicuous, by reason of its large inflated pods, looking like miniature pigs' bladders, and the bright yellow blossoms of the margold (*Calendula officinalis*, L.) are abundant everywhere in gardens. The tincture of calendula is much used by homœopaths to form a lotion for cuts and abrasions. The structure of the flower is very interesting. The central florets, not having any ovary, develop only a pistil for the purpose of pushing the pollen out of the tube formed by the united anthers, and have no stigmas.

In the Chelsea Gardens the botanist will be pleased to see fine specimens of the rare Roman nettle (*Urtica pilulifera*, L.) in full blossom; and several fine plants of the plant lately described as yielding a large proportion of Russian rhubarb, viz., *Rheum palmatum*, var. *Tanguticum*, Max. We believe this is the only garden in England where this plant can be seen growing. In the economic house at Kew, the jute plants (*Corchorus capsularis*, L., and *C. olitorius*, L.) have been putting forth their small flowers, and the *Osmanthus fragrans*, Lour., is again perfuming the air with its delicious odour. At Regent's Park, the tea plant, *Thea sinensis*, and the West Indian arrowroot plant, *Maranta arundinacea*, are in blossom sparingly, and the ordeal plant of Madagascar (*Tanghinia venenifera*) still puts forth its handsome white flowers.

In the present number of 'Medicinal Plants' by Bentley and Trimen, the following species are illustrated:—*Cimicifuga racemosa*, a double plate including a figure of the fresh root, but not showing a section of the rootlets; the balsam of tolu plant; the German pellitory root (*Anacyclus officinarum*, Hayne); *Andrographis paniculata*, Nees., one of the chiretta plants of India; the plant yielding the teel or sesame seed and the gingelly oil of commerce (*Sesamum indicum*, L.); *Cannabis sativa*; and the arrowroot plant, including a figure of the rhizome showing the transverse section. The balsam of tolu plant was drawn from specimens in the Hanbury collection now belonging to the Pharmaceutical Society, and the arrowroot rhizomes also from specimens in the Museum of this Society. It is rather singular that the *Anthemis altissima*, D.C., should have occurred in several English herbaria, as stated by the authors, in place of *Anacyclus officinarum*. This is the case, even in the herbarium of so accurate a botanist as the late D. Hanbury. The two plants however have considerable resemblance in habit.

During the past month the counties of Devonshire and Cornwall have been inundated by scientific men; the meetings of the British Association and other societies having attracted representatives of all the sciences from the most distant parts. There is plenty of food for men of science in these two counties; the geologist may explore rocks, caves, and pits to his heart's content; the mining engineer finds more than sufficient to engross his attention; the botanist may execute his walking excursions and return with glorious treasures in the way of ferns, mosses, and lichens; the chemist is attracted by the sources of mineral wealth to be found here and by the processes of extraction employed. But above and beyond all these things is the charming wildness of scenery and beauty of landscape to be witnessed in the counties in question. And it is seriously to be feared that in these features British philosophers have found more charms than in the section rooms of the Association. In consequence, but few hotels in Plymouth, even to the smallest, are unable to boast of the amount of philosophy which has of late been entertained at them severally. British philosophy as understood by the crowd is a curious entity; it is chiefly boasted when some learned and shaggy man of science propounds doctrine whose very tenets prohibit the possibility of its truth; it sinks to its lowest ebb when it assembles, or rather does not assemble, to listen to so many hard and dry matter of fact results sufficient to form the basis of a reasonable hypothesis. British philosophy is much like British virtue—its life is a series of fits and starts, nothing even and continuous in it, but appearing from time to time like the nodes in a wave of light or sound.

Nevertheless English science is very unlike British philosophy; it is true the public, and especially the effeminate public, rejoices in eloquence brought to bear upon subjects far removed from the mental grasp. A lecture on spiritualism or table-rapping, a discourse on life derived from meteoric sources, a paper on the prehensile movement of the upper joint of the big toe, a dissertation on germs: these are the subjects for the public. Therefore it is that the under-current of true and profound science prosecuted in this country fails to attract great public attention; it is too hard, dry, and technical, and even were it otherwise there are but few men who have the power to convey such knowledge in such a way as both to please and instruct a popular audience. Daily newspaper science is, therefore, for the most part popular science, and the more clap-trap there be in it, the more popular is it.

The meeting of the British Association which has just concluded, was not prolific of sensational papers; but though the various contributions to the several departments were not so numerous as on some previous occasions, their merit was quite up to the normal standard. Although Professor Allen Thomson's address has appeared *in extenso* in this Journal, there are yet a few points in it worthy of some observation. Thus, in presenting a summary of information which has been obtained regarding zymotic diseases (or the various forms of fevers), he states that organisms are, as near as can be perceived, the very essence of contagia. The various reports, however, of Dr. Burdon Sanderson to which he refers, and those of Dr. Creighton present another and more plausible view of these fevers. It is true that in these processes of disease, so called organisms, are always present, but that they are present as the acting cause is a proposition absolutely without any foundation in fact, so far as is known at present. On the other hand, it has been shown that in putrid animal infusions capable of producing such fevers, there is present ferment-matter of a particulate nature, which may be removed by a suitable process of filtration, and inasmuch as the filtered extracts are no longer poisonous, the source of the fever-process must reside in the ferment thus separated. Of the nature, quality, and quantity of that ferment matter we know extremely little; it is certain we do not recognize in it an organism, and it is more than probable we never shall do so. That is to say, germs or organisms are the general concomitants of disease; that they constitute the causes is an unproven and improbable doctrine. Strong as these words are, they are not too strong, for this subject is one which calls strongly for further elucidation, and preconceived opinions are but so many stumbling-blocks in the way of the investigation.

While speaking of this subject, a passing reference may be made to the address on Contagium Vivum, recently delivered at the meeting of the British Medical Association, by Dr. Roberts of Manchester. After reviewing the various researches of Pasteur, Cohn, and others, upon the subject of germs and their development, Dr. Roberts concluded with these words, "I believe that the doctrine of a contagium vivum is established on a solid foundation." In arriving at this conclusion, he is guided by the work of Dr. Burdon Sanderson, Dr. Creighton, and others who have carried out similar investigations, and from what has been stated above in allusion to Dr. Thomson's oration, we find it impossible to accept Dr. Roberts' anticipations. Germs are the concomitants of certain diseased processes, their life may influence and modify disease and even produce secondary processes, but it has not been established in any way that they are the first causes of disease.

Professor Abel, in his address to the chemical section of the British Association, which is also printed *in extenso* in this Journal. expatiated on the advantage likely to accrue to industry from the prosecution of researches in abstract science. This he illustrated by references to Mr. Perkins' address of last year, and by the history of iron and steel manufactures. Some observations made also on the relative importance, as regards the advancement of science and its influence upon industrial progress, of researches in analytical and organic chemistry, were particularly to the point in the present day when so many chemists are led away from the pursuit of their science generally, to one particular and indeed subordinate branch of it. The branch referred to, is that of the chemical structure of carbon compounds, and it is one whose pursuit not rarely leads to the building on paper of the most airy structures with no kind of stability. Not that this branch of inquiry is altogether to be condemned, but depending as it does upon what must ever remain hypothetical, its importance can never be paramount.

All research conducted upon reliable materials by sound methods, yields useful and valuable results, but it cannot be denied that these have different values at different times, and it must ever be the object of the scientific and philosophical chemist not alone to learn new facts, but to ascertain principles, make generalizations, and discover laws. In the present day but few men ever attempt generalizations; their work is too much devoted to isolated facts, and Professor Abel's address would have been still more valuable had he laid more particular stress upon this subject.

But comparatively little new matter was presented to the chemical section, most of the papers having appeared to a greater or less extent elsewhere, and having been noticed in this Journal.

On Friday, the 17th August, the Society of Public Analysts held a meeting at Plymouth, Dr. Dupré being in the chair, and in the course of a brief address he referred to the paper read a few days before at the Pharmaceutical Conference. In doing so, however, he entirely ignored the facts established by Dr. Paul and Mr. C. T. Kingzett, and followed the precedent of Professor Redwood, whose remarks regarding the sale of preserved peas containing copper were at least purely speculative if not quite irrelevant to the research in question. The authors of the paper did not deal with the right of shopkeepers to sell such peas, but proved by experiment that if such peas were eaten, no injury whatever to health could result, inasmuch as most of the small quantity of copper present in such peas is excreted in the fæces. The two propositions, therefore, have nothing in common, but what is important to remember is this, that where persons have been fined for selling such peas, the decisions have always been arrived at upon mere sentimental opinions. Now Dr. Paul and Mr. Kingzett showed beyond doubt that these opinions were incorrect, and consequently the decisions in question have been unjust and mischievous to trade. Dr. Dupré has no right to reject such a conclusion, unless he can disprove by experiment its correctness.

On the evening of Monday, August 20th, Professor Odling gave an address at the British Association on the newly discovered metal gallium, so named in honour of France. Among other characters, the lecturer stated those that are here noticed. The metal occurs for the most part in zinc blende, in which M. Lecoq Boisbaudran discovered it by means of spectrum analysis. The richest ores contain about 1 part of gallium in 100,000 parts, while the poorer ones only yield 1 part in 400,000 parts of ore. At a temperature of about 30°C. the metal melts and has a tendency to remain liquid even below that point, until it is touched by some solid substance, when it congeals to a crystalline solid with the specific gravity 5·93. In relation to this specific gravity, it is interesting to note that it is identical with that predicted by Mendeleef for the metal before it was discovered, on the basis of his so-called periodic law among the elements. Dr. Odling gave an interesting account of this law, and stated that Mr. Newlands was the first chemist to arrange the elements in such a seriation that new ones might be predicted to exist where certain gaps are observed in the seriation of atomic weights. It may be noted here, that the Chemical Society refused to publish Mr. Newlands' paper in their journal, although it was read before a meeting of that society, and beyond Mr Newlands' own claim to this theory of the chemical elements, it was stated and admitted for the first time in the *Pharmaceutical Journal.* Gallium is not readily oxidizable, and therefore does not tarnish on exposure to the air; it forms an alum consisting of the double sulphate with ammonium which is beautifully crystalline. This salt is more soluble in cold than in hot water, so that if a saturated neutral solution of it, contained in a tube, be immersed in boiling water, it deposits as a crystalline mass making the liquid opaque. Dr. Odling exhibited specimens of the metal, and some of its salts, and performed several experiments before his audience, illustrative of the distinguishing features of gallium.

In a recently published pamphlet (2nd edition) 'On a plan for Rendering Salted Meat more Nutritious, thereby Preventing Scurvy,' Professor Galloway calls attention to the loss of phosphate of potash, which results by the operation of salting meat. It is to the deficiency of this mineral substance in such meat that the author ascribes the outbreaks of scurvy that from time to time occur among those who partake largely of such food, and he advocates the plan of eating phosphate of potassium with salted meat, just as in like manner common salt is eaten with fresh meat. Whatever value Professor Galloway's method may ultimately be proved to possess, it is so simple and reasonable in its argument that it deserves a thoroughly good trial.

Perhaps there is no department of the business of a pharmacist demanding more care and attention than that of dispensing. In it he is constantly meeting with fresh difficulties, which frequently the teachings of experience alone can solve. Some members of the medical profession write as though incompatibilities had no existence; others throw the most incongruous materials into a mixture and expect the dispenser from those ingredients to develop an elegant and palatable result. Hence the cry for assistance, and the earnest appeal to know what in the presence of certain difficulties would be done by those leading houses that are representatives of high class pharmacy. It is unfortunately the case that many of those who write prescriptions do not take the trouble to make themselves acquainted with changes, the result of progress, necessarily involved in a new pharmacopœia, and it is equally unfortunate that immature preparations are sometimes introduced into the Pharmacopœia, and trifling changes made in some of those preparations which remain, without any apparent object, making a distinction without a difference, by no means indicative of progress but rather of an "advance in the rear." A spirituous solution of chloroform was found useful, and frequently prescribed, hence the spirit of chloroform was introduced into the Pharmacopœia. Taraxacum also was a favourite with some prescribers, but there was no officinal fluid formula, hence succus taraxaci found a place there also; but in both these cases some members of the medical profession ignore the official formulæ for sp. chloroformi and suc. taraxaci, and continue to order proprietary preparations which have no official existence. This may seem a light matter to those who are in a position to know what the prescriber means, but it is no light matter to those less favourably situated who, guided by the Pharmacopœia, entertain a very reasonable belief that every prescriber is acquainted with its contents and will prescribe accordingly. An instance of this kind occurs among the difficulties that have been made known in the Dispensing Memoranda during the past month.

No. 10 relates to ext. taraxaci liq. For this preparation there never has been an official formula. Formerly solutions of the extract, in some cases, supplied its place, and were dispensed of different strengths at different establishments. Even now a preparation of the dried root is considered by some to represent it; but the introduction of the succus taraxaci into the Pharmacopœia was probably intended to supply a formula for the most reliable preparation of a very unreliable remedial agent.

No. 11 describes a difficulty that has been experienced in making tr. ferri perchl., B.P., from the liq. ferri perchl. fort. A reference to the correspondence which has taken place in this Journal on the subject will afford a good deal of valuable information. The change in colour is well described, and its occurrence is not infrequent. It has been shown that a more satisfactory result is obtained by using in the preparation of the liq. ferri perchl. fort, about one-seventh less nitric acid. The addition of water to the spirit in making the tincture from the liquor is not admissible, and is also quite unnecessary. The gas evolved is believed to consist of chlorinated ethereal compounds liberated by the action of the excess of nitric acid on the spirit of wine. The deposition of ferric oxide is unusual and must have resulted from imperfect manipulation.

No. 12 is a question how to coat pills with a preparation of liquorice without heat, so that they shall have a shiny black appearance. This probably refers to such a coating as is given to pipe liquorice, which is done by dipping it into gelatine. Formerly pills were coated in a similar manner, but the process is in practice too tedious. Now the tolu in ether is generally used and with satisfactory results. This subject has been well discussed in the earlier journals, where fuller and more detailed information may be sought.

No. 13 relates to a mixture containing quinæ sulph. with potass. bic. and sp. am. co., and asks how it can be dispensed so that the quinine will remain in solution. Such a mixture is said to have been made up at one of the leading dispensing establishments in London with a satisfactory result. If quinine be ordered in a mixture with sodæ or potassæ bicarb., it should be rubbed to a powder and mixed with the diluent, when it will remain more or less suspended, but the moment that the sp. am. co. is added to this mixture the quinine will be thrown out in a resinous condition. This is one of those cases in which it is the duty of the dispenser to represent the difficulty and the incompatibility of the ingredients to the writer of the prescription, and to suggest an alteration, so that his intention may be carried out, that "each dose should contain a definite quantity of quinine," which cannot be the case when the greater part of the quinine adheres to the sides of the bottle.

No. 14 asks, respecting two prescriptions, how they can be sent out clear, this being reported to have been done with the first. In the first prescription, if all the ingredients be mixed and the acid. phosphoric. dil. added gradually and last, there will result a mixture slightly opaque, but in other respects perfectly satisfactory. In twelve hours a slight deposit will occur. If a ferri et quinæ cit. containing less than the proper quantity of quinine be used, a more satisfactory looking mixture may be made but at the expense of its full medicinal value. This probably explains how it may have been sent out quite clear, but it is better to have a clear conscience and a slightly opaque mixture than an opaque conscience and a clear mixture.

The second mixture referred to in No. 14 is one containing ferri et quinæ cit. and sp. am. co., and the remarks on the mixture in No. 13 will also apply here. If the ferri et quinæ cit. has its full quantity of quinine there will be separation of the quinine in flakes floating for a time on the surface of the mixture, and ultimately adhering to the sides of the bottle. If the sample of ferri et quinæ cit., from which the mixture is made, be deficient in quinine, the resulting mixture will show less separation.

No. 15. A formula is required for mist. ammon. conc., 1 to 7. This is scarcely a dispensing question, but a manufacturer would probably proceed somewhat as follows:—Make a permanent emulsion of 1 part of ammoniacum in 4 parts of water, and when required for use add 1 part to 7 of water.

No. 16. It is not quite clear whether the difficulty in this prescription lies with the quantity of capsicum, which is not given, but only q. s., or in the make of the mass. If the former, it is a case where the dispenser, in the absence of the writer, must use his own judgment. Three grains of capsicum in one dozen pills is quite usual, and to make the ingredients combine well there is no better excipient than the jelly of glycerine and tragacanth so frequently alluded to in this Journal. It may be accepted as a useful and practical fact than when ferri sulph., either dried or otherwise, is prescribed with aloes, there is no better excipient than the glycerine and tragacanth jelly.

No. 17 is a pill query as to how a good mass may be made from which the oil of caraway shall not separate, or the pill mass become crumbly when made into pills.

In making pill masses regard must always be had to the excipient, and as this query is one from an apprentice, he will do well to remember that he cannot pay too much attention to this fact. Here the tragacanth jelly is not the best, but a drop or two of decoct. aloes co. is most satisfactory in its result; the whole of the oil is retained, and the mass is all that can be desired for rolling into pills. But no time should be lost in doing so, or there will result a partial separation of some of the ingredients.

No. 18. Ox gall pills are frequently ordered by some prescribers, and there is always more or less difficulty in making them so as to retain their shape. A very satisfactory, and probably the best, method is to evaporate further the purified ox gall, make up the loss in weight by tragacanth, roll pretty quickly, either varnish with tolu or omit the varnish, and then send out in a bottle; but where any ingredient in a pill is especially liable to absorb moisture from the atmosphere, a coat of the varnish of tolu in a suitable solvent is very valuable.

Information as to the dispensing of empirical formulæ will only be of value so long as the same conditions present themselves. It is preferable that in these columns the principles mainly should be indicated, and the cultivated intelligence of the dispenser required to assist in their application. In this way only can the dispensing memoranda while rendering present assistance be of any practical and permanent value.

ASBESTOS.*

It is only quite recently that this substance has risen from being simply a mineral curiosity to a quasi-important article of commerce, on account of its peculiar qualities, being indestructible in fire or by acids, fibrous, and capable of being woven into cloth or made into paper, often as fine as the finest flax or silk, or like spun glass, although strictly a mineral product. In early antiquity it was made the subject of curious myths and strange tales bordering on the fabulous. Practically its sole use then seems to have been for winding sheets, in which to burn distinguished dead, or to be spun into napkins, which were used at exceptional feasts, and, to the astonishment of the guests, afterwards thrown into the flames, to come out intact, white and purified. At least Pliny mentions this; and it also would appear that Charles I. had tablecloths made of it, which he also was accustomed to throw into the fire for the same purpose. More recently stockings and a handkerchief were made in Elba of asbestos, as gifts to Napoleon I. while living there in exile. From time immemorial the peasantry where it is found, in various countries, have turned it to economical use as an incombustible lampwick, for which purpose its power of capillary attraction admirably qualifies it.

Common asbestos, more or less fibrous, but of a powdery, brittle quality, is abundant in most countries, and begins to find its way into some of the industrial arts, but largely mixed with other materials. The strong, long, fibrous sorts, varying in colour from pure white to dark brown, thus far are only found in sufficient quantity for commerce in the Italian Alps, at elevations of several thousand feet, and often, for much of the year, buried under the snow. They occur in serpentine rocks, in irregular veins, usually very narrow, and requiring much heavy labour and blasting to open. Sometimes, but very rarely, masses are found in one lump, weighing several hundredweight. More frequently the veins prove very superficial, and give out almost at once. Then again, they can be steadily worked for years, as they extend or penetrate into the mountain. Although some of these have been yielding as much fibre as there was a demand for since they were first opened in 1871-2, recently the increased call has led to the discovery of new productive veins of the very best quality, which will increase the outcome from a few scores of tons per annum to several hundreds. But the price, heretofore varying from £50 to £100 a ton, according to the quality and condition of the fibre, threatens to grow firmer, owing to the new uses now springing up for it, mostly based on patents, whilst Italian capitalists themselves begin to see the importance of a mineral, of which Italy has as yet a virtual monopoly, and are preparing to manufacture it on the spot where it is found into those goods which already find a steady and increasing demand.

These are chiefly, steam-packing in the rope or loose form for piston and pump rods, and stuffing boxes, and millboards for steam-joints, gaskets, man-hole plates, and a species of felting to cover boilers and steam-pipes. The ability of asbestos to resist an elevated temperature, moisture, friction and flame itself, joined to its lubricating quality, specially recommends it for the above purposes. The chief objection to the manufacturer is that, when properly prepared and applied it lasts too long. As a covering for boilers and pipes, it saves 25 per cent. or more of the waste heat; and in domestic uses in cellars, to prevent loss of heat by radiation, it is found to reduce the temperature of the cellar 15°, while raising that of the house above 10°, *i.e.*, it saves the furnace or steam heat, and sends it where it is most wanted.

Asbestos lining or sheathing paper, especially for wooden houses, for ceilings, floors and partitions, to prevent the spread of flames and make each room fireproof, is now attracting attention in America, and must recommend itself to builders generally, as rendering buildings not only safer from fires, but cooler in summer and warmer in winter, and free from insects that harbour in common papers, These papers are made in rolls of any thickness or length, and can be coloured or printed with any desirable pattern. Fireproof boxes for shelves in shops can also be made of this substance, and scenery for theatres, if fabricated of it, would be impervious to flames.

The varieties of asbestos are quite astonishing to those who have not made a study of this mineral. No two localities seem to yield precisely similar fibre. In the cabinet of Mr. C. A. Wilson, Genoa, Italy, there are at least one hundred distinct varieties from the Alps alone; one specimen when taken out of the mine was five feet long, and weighed 700lb., of the most delicate cream colour, and soft, like raw silk, after separating the fibres.

In America the asbestos business is mainly in the hands of a Boston company, protected by fifteen patents on various goods, and begins to assume a prosperous condition, calling for increased supply of the crude article, whilst in Great Britain it is chiefly centred in a flourishing Glasgow company, which was the first to risk the novel enterprise of trying to utilize a well-known mineral that has waited more than 2000 years to become useful to men. In Paris it is begun to be adopted for civil and public registers in the form of a fireproof writing paper. Recently, patents have been taken out in America and England to cover its use as a fuel-bed for petroleum in any sort of stove or engine-furnace. It absorbs and retains the oil, its capillary attraction causing it to burn only on its surface, where it is under perfect control, and gives out an intense heat. By a simple arrangement the hydrocarbons can further be converted into gas-fuel, so it is claimed.

These facts would indicate that there is a business future for this mineral, and that new uses for it are likely to be discovered. The most beautiful varieties of the long, soft, flexible and extremely fine fibres, commonly known as "floss," and which are more abundant than the strong, tenacious fibres, yet await a call in the industrial arts.

* From *Iron*, August 18, 1877.

The Pharmaceutical Journal.

SATURDAY, AUGUST 25, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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OFFICIAL VERSUS NONOFFICIAL PREPARATIONS.

IT is no part of the pharmacist's duty to attempt to dictate to the medical practitioner as to the forms in which medicine shall be prescribed, whether they shall have the sanction of the Pharmacopœia or simply the seal of the trade mark. He may, and not unnaturally will, have decided opinions as to the advantages or disadvantages of certain preparations, and he is quite justified in taking suitable opportunities for making known such opinions, which, as the result usually of peculiar facilities for forming a judgment, would have their value. But he will be careful not to overstep the mark, and having liberated his soul upon the subject he will hold himself ready scrupulously, and to the best of his ability, to carry out the prescriber's wishes. Even in such a special case as the use of the lower priced cinchona alkaloids during the present abnormally high price of quinine, as was remarked by a speaker at the late meeting of the Conference, the medical man is the sole judge of its propriety, and any pertinacity on the part of the pharmacist in recommending such a course would be officious and out of place.

Nevertheless the subject is not unimportant to the pharmacist, and he will therefore follow with interest a discussion that is occupying the columns of some of our medical contemporaries. This discussion had its origin in a letter to the *Lancet*, in which the writer, calling attention to the growing practice of prescribing special preparations, alleges that the fact of a physician ordering in an ordinary case no less than four advertised preparations is "a great confession of the poverty of the Pharmacopœia." How far this is true, and whether the poverty may not too frequently lie in another quarter, namely, in the prescriber's knowledge of the best ways of using the official materia medica, appears to be fairly open to question.

Everybody must admit the skill and ingenuity in making nauseous medicines palatable displayed in many of the preparations that have been recently introduced; probably what has been termed "elegant pharmacy" has never before been carried to such perfection. Examples need not be cited here; they will be present to the mind of every reader. It is not surprising, therefore, that the physician should avail himself of some of these facilities for administering medicine in a form agreeable to the patient. But we are not sorry to notice in our contemporary, the *Medical Press and Circular*, a timely word of caution against carrying this practice too far, "to the neglect of those standard Pharmacopœia preparations which would be often found more serviceable."

To say nothing of the inconvenience to the pharmacist who finds himself called upon to supply a multiplicity of preparations other than the official ones, and the doubt which not unfrequently occurs as to what compound is meant, there are other obvious disadvantages that would accompany an extension of the practice. It must be confessed, for instance, that there would always be an element of uncertainty as to how far these compounds answered to what they were represented to be. It is no reflection upon preparations now in the market to assume that as the demand developed others might appear that would not always contain the ingredients attributed to them, or to put it euphemistically the active properties of which might be partially lost during the preparation. It will not be forgotten that in the United States, where the practice of prescribing proprietary preparations is carried out more extensively than in this country, a committee not long ago reported meeting with elixirs in which the strychnia they were supposed to contain was not only imperceptible to the palate, but undiscoverable by chemical analysis. Moreover it is at least plausible to suggest that the prescribing of such compounds made up according to a fixed formula, unless there be an infinity of them, must sometimes tend to the accommodation of the dose to the form of the medicine as much as to the necessity of the case. Finally, there is the fact, which, as pointed out by our contemporary, before mentioned, probably explains to some extent the tendency to prescribe the preparations in question, namely, that materia medica is already a comparatively neglected portion of the medical education. But if the acknowledged imperfect acquaintance with the Pharmacopœia and its preparations be still further diminished through disuse, the loss to suffering humanity and the consequent reproach to medicine must increase in proportion.

THE AMERICAN PHARMACEUTICAL ASSOCIATION.

IT will be remembered that at the meeting of this Association last year in Philadelphia it was decided to accept the invitation of the pharmacists of Toronto, and to meet this year, for the first time on British soil, in that city. The gathering will take place in the first week in September, and already the Dominion pharmacists are making preparations to give their United States brethren a hearty reception. Besides the reading and discussion of papers, there will be an exhibition of objects connected with pharmacy to compete for the attention of visitors. There is to be a reception in the Normal School Building, which has been placed at the disposal of the Association by the Minister of Education, and Dr. S. P. May, of the department, has promised to deliver a lecture on some scientific subject. The arrangements for the inevitable sequence to such a meeting, an excursion, are not yet completed, but the formation of camps at some fishing station is shadowed forth, and even the organization of a ladies' camp is to be attempted. On the other hand there is a project for the intending visitors from the United States to form one party, to rendezvous at the Niagara Falls in the previous week, and indulge in some preliminary excursions before proceeding to Toronto.

Whilst speaking of Canada it may be remarked that at present Pharmacy Acts are in operation in three of the provinces of the Dominion, but in the others the practice of pharmacy and the sale of poisons are unrestricted. The inconvenience resulting from this state of affairs has turned attention to the advisibility of having one uniform law for the whole Dominion, and the introduction of such a Bill into the Dominion Parliament is contemplated.

THE BRITISH ASSOCIATION MEETING.

The meeting of the British Association at Plymouth came to an end on Wednesday last, when the Treasurer announced that the total attendance, as indicated by the subscriptions, amounted to 1,244. Mr. William Spottiswoode, F.R.S., has been chosen President-Elect for the meeting in Dublin next year. There is an understanding that in 1879 the Association shall meet in Swansea, whilst its fiftieth anniversary is to be held in 1881 in York, the city in which it was established in 1831. The grants of money that have been voted in aid of research in connection with various subjects amount altogether to £1,081. This is a smaller sum than has been devoted to a similar purpose in previous years, the decrease being attributed to the falling off in the receipts. In replying to a vote of thanks the President alluded to the loss that the Association and science generally had sustained in the recent death of Mr. Gassiott.

DEATH FROM CHLOROFORM AVERTED BY THE INHALATION OF NITRITE OF AMYL.

A correspondent of the *British Medical Journal* communicates the interesting observation, that in a case of syncope during the administration of chloroform, where the usual treatment was without effect and death seemed imminent, the application of some lint saturated with nitrite of amyl to the nostrils was followed almost immediately by restoration of the pulse, and the subsequent recovery of the patient.

The revenue derived from the stamp on patent medicines during the financial year ending March 25, amounted to £112,978 17*s.* 5*d.*, after an allowance of £5,242 15*s.* 2½*d.* in discounts, etc.

Proceedings of Scientific Societies.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The President's Address.

(*Concluded from page* 139.)

Among the earliest changes to which the perfect animal ovum is subject, I have first to refer to the segmentation of the germ, a series of phenomena the observation of which has been productive of most important results in leading to a comprehension of the intimate nature of the formative process, and which is of the deepest interest both in a morphological and histological point of view. This process, which was first distinctly observed by Prevost and Dumas more than fifty years ago, and is now known to occur in all animal ova, consists essentially in the cleavage or splitting up of the protoplasmic substance of the yolk, by which it becomes rapidly subdivided into smaller and more numerous elements, so as at last to give rise to the production of an organized stratum of cells out of which, by subsequent changes, the embryo is formed.

The process of yolk-segmentation may at once be distinguished as of two kinds, according as it affects in the small-yolked ova the whole mass of the yolk simultaneously, or in the large-yolked ova is limited to only one part of it. The cleavage process, in fact, affects the germinal and not the food-yolk; so that to take the two most contrasting instances of the bird and mammal, to which I have before referred, it appears that while the mammal's ovum undergoes entire segmentation, this process is confined to the substance of the cicatricula or germinal disk of the bird's egg. This process is essentially one of cell-division, but it is also in some measure one of cell-formation. The best idea of its nature will be obtained from a short description of the total segmentation occurring in the mammal's ovum.

When, as before mentioned, the germinal vesicle has been in part extruded or lost to sight, the whole yolk-substance of the ovum forms a nearly uniform mass of finely granular protoplasm, enclosed within the external cell-membrane. Within a few hours later a clear nucleus has arisen in this mass. To this more definite form of organization assumed by the germinal substance of the future animal, which is about to be the subject of the segmenting process, the name of the first segment-sphere may be given.

By the process of cleavage which now begins, this first segment-sphere and its nucleus undergo division into two nucleated spheres of smaller size, the whole substance of the yolk, in a holoblastic ovum, such as that of the mammal, being involved in the segmenting process.

The second stage of division follows after the lapse of a few hours, and results in the formation of four nucleated segment-spheres; and the process of division being repeated in a certain definite order, there result in the succeeding stages (that is, the third, fourth, fifth, and up to the tenth) the numbers of 8, 12, 16, 24, 32, 48, 64, and 96 nucleated yolk-spheres, germ-spheres, or formative cells.

In the rabbit's ovum the tenth stage is reached in less than three days; and as during that time the size of the whole ovum has undergone very little increase, it follows that the spheres of each succeeding set, as they become more numerous, have diminished greatly in size. These segment-spheres are all destitute of external membrane, but are distinctly nucleated; and their protoplasmic substance is more or less granular, presenting the usual histological characters of growing cells.

By the time that segmentation has reached the seventh or eighth stage, when 32 or 48 spheres have been formed, the ovum has assumed the appearance of a mulberry, in which the outer smaller spheres, closely massed together, project slightly and uniformly over the whole surface; while the interior of the ball is filled with cells of a somewhat larger size and a more opaque granular aspect, also resulting from the process of segmentation.

Already, however, the mutual compression of the spheres or cells on the surface, by their crowding together, has led to the flattening of their adjacent sides; and by the time the tenth stage is reached, when the whole number of the cells is about 96, the more advanced superficial cells, having ranged themselves closely together, form a nucleated cellular layer or covering of the yolk, enclosing within them the larger and more opaque cells, derived like the first from the segmenting process. In a more advanced stage, the deeper cells now referred to having also taken the form of a layer, there results at last the bilaminar blastoderm or embryonic germinal membrane.

The process of partial segmentation, such as occurs in the bird's egg, though perhaps fundamentally the same as that of the mammal previously described, stands in a different relation to the parts of the whole yolk or egg, and consequently differs in its general phenomena. The segmentation is mainly restricted in the meroblastic ova of birds to the germinal disk of cicatricula, and does not immediately involve any part of the larger remainder of the yolk. This takes place during the time of the descent of the yolk through the oviduct, when the yolk is receiving the covering of the white or albumen, the membrane, and the shell previous to being laid—a progress which, in the common domestic fowl, usually occupies less than twenty-four hours. Corresponding essentially to the more complete segmentation of the mammal's ovum, the process leads to the same result in the production of two layers of nucleated formative cells in the original seat of a protoplasmic disk—a bilaminar blastoderm resulting as in the mammal's ovum, though in a somewhat different relation to the yolk.

I will not fatigue you with a description of the details of these phenomena, interesting as they may be, but only mention generally that they consist in the formation of deep fissures running from the surface into the substance of the germ-disk. The first of these fissures crosses the disk in a determinate direction, dividing it into two nearly equal semicircular parts. In the next stage another fissure, crossing the first nearly at right angles, produces four angular segments. Then come four intervening radial fissures which subdivide the four segments into eight; and next afterwards the central angles of these eight radial segments are cut off from their peripheral portions by a different fissure, which may be compared to one of the parallels of latitude on the globe near the pole where the radial or *longitude* fissures converge. And so thereafter, by the succession and alternation of radial and circular clefts (which, however, as they extend outwards, come soon to lose their regularity), the whole germinal disk is divided into the two layers of nucleated cells, constituting the blastoderma or germinal membrane of Pander and all subsequent embryologists.* If a laid egg be subjected to the heat of incubation for eight or ten hours, the cicatricula, now converted into this segmented blastoderm, is found to be considerably expanded by a rapid multiplication of its constituent cells; and in as many more hours, by further changes in its substance, the first lineaments of the chick begin to make their appearance. Similar changes affect the blastoderm of the mammal; and thus it appears that the result of segmentation, in the bird as well as in the mammal and other animals, is the production of an organized laminar substratum, which is the seat of the subsequent embryonic development.

I must still request your attention to some details connected with the process of segmentation, which bear upon the question of the origin of the new cells, and on which recent research has thrown a new and unexpected light.

With respect to the nature of the first segment-sphere of the ovum and the source of its nucleus, as well as of the other segment-spheres or cells which follow each other in the successive steps of germ-subdivision, it appears probable, from the researches of several independent observers, and more especially of Edward Van Beneden and Oscar Hertwig, that in the course of the extrusion of the germinal vesicle a small portion of it remains behind in the form of a minute mass of hyaline substance, to which Van Beneden has given the name of *pronucleus*, and that, as the result of the fertilizing process, there is formed a second similar hyaline globule or pronucleus, situated near the surface, which gradually travels towards the centre and unites with the first pronucleus, and that these two pronuclei, being fused together, form the true nucleus of the first segment-sphere. According to this view the original germinal vesicle, when it disappears or is lost to sight, as described by so many embryologists, is not dissipated, but only undergoes changes leading to the formation of the new and more highly endowed nucleus of the first embryonic or segmental sphere. It further appears that the subdivision of each segmenting mass is preceded by a change and division of the nucleus, and that this division of the nucleus is accompanied by the peculiar phenomenon of a double conical or spindle-shaped radial lineation of the protoplasm, which, if we were inclined to speculate as to its nature, seemed almost as if it marked out the lines of molecular force acting in the organizing process. These lines, however, it will be understood, if visible with the microscope, even of the highest magnifying power yet attained, belong to much larger particles than those of the supposed molecules of the physicist; but, considered in connection with what we know of the movements which frequently precede the act of division of the yolk-spheres, we seem in this phenomenon to have made some near approach to the observation of the direction in which the molecular forces operating in organization may be supposed to act.*

* The more exact nature of the process of segmentation was first made known by the interesting researches of Bagge in 1841, and more especially of Kölliker in 1843. The phenomena of complete segmentation were first duly described in the mammal's ovum in Bischoff's description of the development of the rabbit, 1842, and followed out in his succeeding memoirs on the dog, guinea-pig, and roedeer. The phenomena of partial segmentation were first made known, in their more exact form, by Kölliker's researches on the development of the Cephalopoda, published in 1844. In birds the process was first described by Bergmann in 1846, and more fully by Coste in 1848.

* The observations referred to above as to the division of the nucleus are so novel and of such deep interest that I am tempted to add here a short abstract of their more important results from a very clear account given of them by Dr. John Priestley, of Owens College, Manchester, in the *Journal of Microscopical Science* for April, 1876.

The researches now referred to are those of Auerbach, Butschli, Strasburger, Hertwig, and Edw. Van Beneden; and the following may be stated as the points in which they mainly agree:—

The nucleus when about to divide elongates into a spindle-shaped body, becomes irregular and indistinct, acquires a granular disk or zone in the plane of its equator; this divides into two, and each half moves towards the pole of the spindle on its own side, there being radiated lines of protoplasm between the poles and the equatorial disk.

The disk segments are the new nuclei, and the subsequent division of the cell takes place in the intermediate space.

Although these observers still differ in opinion upon some of the details of this process, and especially as to the fate of the germinal vesicle, all of them seem to agree that there are two pronuclei or distinct hyaline parts of the yolk-protoplasm, a superficial and a deep one, engaged in the formation of the new nucleus; and both Hertwig and Van Beneden are of opinion that the two proceed from different productive elements.

The radiated structure of the nuclei had been previously recognized by Fol and Flemming, and further observed by Oellacher.

1. Butschli's researches are published in the *Nov. Act. Nat-Cur.*, 1873, and in the *Zeitschr. für wissensch. Zool.* vol. xxv.

2. Auerbach's observations in his 'Organolog. Studien.'

With respect to the nature of the blastoderm, the organized cellular stratum resulting from segmentation, and its relation to the previous condition of the ovum on the one hand, and the future embryo on the other, there is presented to us, by modern research, the interesting view that the blastoderm consists, after completion of the segmenting process, of two layers of cells—an outer or upper (usually composed of smaller, clearer, and more compact nucleated cells), named *ectoderm* or *epiblast*, and an inner or lower (consisting of cells which are somewhat larger, more opaque and granular, but also nucleated), named *endoderm* or *hypoblast*.

In the meroblastic ova, such as those of birds, the bilaminar blastoderm is discoid and circumscribed as it lies on the yolk-surface, and only comes to envelop the whole of the food-yolk in the progress of later development; while in the holoblastic ova, and more especially in mammals, the blastoderm from the first extends over the whole surface of the yolk, and thus forms an entire covering of the yolk known as the "vesicular blastoderm," the space within being occupied by fluid.

Huxley long ago presented the interesting view that these two layers are essentially the same, in their morphological relations and histological structure, as the double wall of the body in the simplest forms of animals above the Protozoa; and Haeckel has more recently followed out in this view, and supported it by his researches in the Calcareous Sponges, and has founded upon it his well-known *Gastræa* theory. According to this view all animals take their origin from a form of *Gastrula*. In the simpler tribes, as in the instance of the common freshwater polype or Hydra, they proceed no further than the Gastrula stage, unless by mere enlargement and slight differentiation of the two primitive layers of cells representing the persistent ectoderm and endoderm.*

If, pursuing this idea, we take a survey of the whole animal kingdom in its long gradation of increasing complexity of form and structure from the simplest animal up to man himself, we find that all the various modifications of organic structure which present themselves are found, in the history of the individual or ontological development of the different members of the series, to spring originally from two cellular laminæ, ectoderm and endoderm, the component elements of which may again be traced back to the first segment-sphere and primitive protoplasmic elements of the ovum.

Time does not admit of my conducting you through the chain of observation and reasoning by which Haeckel seeks to convince us of the universal application of his theory; but I cannot avoid calling your attention to the extremely interesting relation which has been shown to exist between the primary phases of development of the ovum and the foundation of the blastoderm in very different groups of animals, more especially by the researches of Haeckel himself, of Kowalevsky, Edward Van Beneden, and others, and which has received most efficient support from the investigations and writings of E. Ray Lankester in our own country; so that now we may indulge the well-grounded expectation that, notwithstanding the many and great difficulties which doubtless still present themselves in reconciling various forms with the general principle of the theory, we are at least in the track which may lead to a consistent view of the relations subsisting between the ontogenetic, or individual, and the phylogenetic, or race history of the formation of animals and of man.*

In all animals, then, above the Protozoa, the ovum presents, in some form or other, the bilaminar structure of ectoderm and endoderm at a certain stage of its development, this structure resulting from a process of segmentation or cell-cleavage; and there are three principal modes in which the double condition of the layers is brought about. In one of these it is by inward folding or invagination of a part of the single layer of cells immediately resulting from the process of segmentation that the doubling of the layers is produced; in the second, perhaps resolvable into the first, it may be described rather as a process of enclosure of one set of cells within another; while in the third the segmented cells, arranged as a single layer round a central cavity of the ovum, divide themselves later into two layers. But the distinction of ectodermic and endodermic layers of cells is maintained, whether it be primitive and manifested from a very early period, or acquired later by a secondary process of differentiation. Thus in many invertebrates, as also in *Amphioxus* among the vertebrates, a distinct invagination occurs, while in mammals, as recently shown by Van Beneden's most interesting observations in the rabbit's ovum, and probably also in some invertebrates, the cells of the ectoderm gradually spread over those of the endoderm during the progress of segmentation, and thus the endodermic comes to be enclosed by the ectodermic layer of cells.

From the very novel and unexpected observations of Van Beneden it further appears that from the earliest period in the process of segmentation in the mammal's ovum it is possible to perceive a distinction of two kinds of segment-spheres or cells, and that when this process is traced back to its first stage it is found that the whole of the cells belonging to the ectoderm are the progeny of, or result from the division of the upper of the two first formed segments, and that the whole of the endodermic cells are the descendants of the lower of the two first segmented cells. This, however, is not an isolated fact belonging only to mammalian development, but one which very nearly repeats a process ascertained to occur in a considerable number of the lower animals, and it seems to promise the means of greatly advancing the comprehension of the whole process of blastodermic formation. Thus ectoderm and endoderm, or the primordial rudiments of the future animal and vegetative systems of the embryo, are traced back as distinct from each other to the first stage of segmentation of the germ.

Accepting these facts as ascertained, they may be regarded as of the deepest significance in the phylogenetic history of animals; for they appear to open up the prospect of our being able to trace transitions between the earliest embryonic forms occurring in the most different kinds of ova, as between the discoid or meroblastic and the vesicular or holoblastic, through the intermediate series which may be termed amphiblastic ova.

In the lowest animals, the two layers already mentioned, viz., ectoderm and endoderm, are the only ones known to constitute the basis of developmental organization; but as we rise in the scale of animals we find a new feature appearing in their structure, which is repeated also in the history of the formation of the blastoderm in the higher animals up to man. This consists in the

3. Strasburger's observations in his memoir 'Ueber Zellbildung und Zelltheilung,' Jena, 1875.

4. Edward Van Beneden's researches, partly in his memoir 'On the Composition and Significance of the Egg,' etc., presented to the Belgian Academy in 1868, and more particularly in the extremely interesting preliminary account of 'Researches on the Development of Mammalia,' etc., 1875, and in a separate paper in the *Journ. of Microscopical Science* for April, 1876.

5. Oscar Hertwig's memoirs are contained in the 'Morpholog. Jahrbuch,' 1875, and his most interesting and novel observations in the same work, 1877.

* At this place I will only refer to one of the most recent of Haeckel's works, in which the views alluded to above are fully exposed in a series of most interesting memoirs, viz., 'Studien zur Gastræa-Theorie,' Jena, 1877; and to Dr. E. Perceival Wright's translation of the account of Haeckel's views in *Journ. of Microsc. Science*, vol. xiv., 1874.

* I ought here to refer to the elaborate memoirs of Professor Semper on the morphological relations of the vertebrate and invertebrate animals, contained in the 'Arbeiten aus dem Zoolog.-zootom. Institut in Würzburg,' 1875 and 1876, in which the conclusions arrived at do not coincide with the views above stated.

formation of an intermediate layer or layers constituting the *mesoderm*, with which, in by far the greater number, is connected the formation of some of the most important bodily structures, such as the osseous, muscular, and vascular systems.

I will not stop to discuss the very difficult question of the first origin of the mesoderm, upon which embryologists are not yet entirely agreed, but will only remark that a view originally taken of this subject by the acute Von Baer appears more and more to gain ground; and it is this—that the mesoderm, arising as a secondary structure, that is, later than the two primary layers of ectoderm and endoderm (corresponding to the serous and mucous layers of Pander), is probably connected with or derived from both of these primitive layers, a view which it will afterwards appear is equally important ontogenetically and phylogenetically.

But whatever may be the first origin of the mesoblast, we know that in the Vertebrata this layer, separating from between the other two, and acquiring rapidly by its cell-multiplication larger proportions and much greater complexity than belongs to either ectoderm or endoderm, speedily undergoes further subdivision and differentiation in connection with the appearance of the embryonic organs which arise from it, and in this respect contrasts greatly with the simplicity of structure which remains in the developed parts of the ectodermic and endodermic layers. Thus, while the ectoderm supplies the formative materials for the external covering or epidermis, together with the rudiments of the central nervous organs and principal sense-organs, and the endoderm by itself only gives rise to the epithelial lining of the alimentary canal and the cellular part of the glands connected with it, the mesoblast is the source of far more numerous and complex parts, viz., the whole of the true skin or corium, the vertebral column and osseous system, the external voluntary muscles and connective tissue, the muscular walls of the alimentary canal, the heart and blood-vessels, the kidneys, and the reproductive organs, thus forming much the greatest bulk of the body in the higher animals.*

There is, however, a peculiarity in the mode of the earliest development of the mesoblast which is of great importance in connection with the general history of the disposition of parts in the animal body, to which I must now refer. This consists in the division of the mesoblast in all but its central part into two laminæ, an outer or upper and an inner or lower, and the separation of these by an interval or cavity which corresponds to the space existing between the outer wall of our bodies and the deeper viscera, and which, from the point of view of the vertebrate animals is called the pleuro-peritoneal cavity, but, viewed in the more extended series of animals down to the Annuloida, may receive the more general appellation of pleuro-splanchnic or parieto-visceral cavity, or, shortly, the *cœlom*. Thus, from an early period in the vertebrate embryo, and in a considerable number of the invertebrate, a division of the mesoderm takes place into the somatopleural or outer lamina and the splanchnopleural or inner lamina—the outer being the seat of formation of the dermal, muscular, and osseous systems (the voluntomotory of Remak), and the inner of the muscular wall of the alimentary canal, as well as of the contractible substance of the heart and the vascular system generally.

It is interesting to find that there is a correspondence between the later division of the mesoderm of the higher animals derived from the two primitive blastodermic laminæ and the original absence of mesodermic structure in the lowest animals, followed by the gradual appearance, first of one layer (the external muscular in the higher Cœlenterata), and soon afterwards by the two divisions or laminæ with the intermediate cœlom.

In this account of what may be termed the organized foundation of the new being, I have entered into some detail, because I felt that our conception of any relation subsisting between the ontogenetic history of animals and their phylogenetic evolution can only be formed from the careful study of the earliest phenomena of embryonic organization. But, notwithstanding the many difficulties which unquestionably still block the way, I am inclined to think that there is great probability in the view of a common bilaminar origin for the embryo of all animals above the Protoza, and that the vertebrate equally with the invertebrate animals may be shown to possess, in the first stages of their blastodermic or embryonic formation, the two primitive layers of ectoderm and endoderm.

To attempt, however, to pursue the history of the development of animals in detail would be equivalent to inflicting upon you a complete system of human and comparative anatomy. But I cannot leave the subject abruptly without an endeavour to point out in the briefest possible manner the bearing of one or two of the leading facts in embryology upon the general relation of ontogeny and phylogeny.

We are here brought into the contemplation of those remarkable changes, all capable of being observed and demonstrated, by which the complex organization of the body is gradually built up out of the elementary material furnished by the blastodermic layers—a process which has been looked upon by all those who have engaged in its study with the greatest interest and admiration. And if, by comparing these phenomena as observed in individuals belonging to different classes and orders of animals, it is found that not only are they not different, but, on the contrary, that they present features of the most remarkable resemblance and conformity, we shall be led to conclude that there is a general plan of development proved to extend to the members of considerable groups, and possibly capable of being traced from one group to another. But this is clearly nothing else than another way of stating that there is a similar type of structure prevading the animals of each group, and a probability of a common type being ascertained to belong to them all. The main question, therefore, to be answered is whether there is or is not a general correspondence between the phenomena of development and the gradation of type in animal structure upon which anatomists and zoologists are agreed; and my object will now be to bring rapidly before you one or two of the most marked illustrations of the correspondence, drawn from the early history of development in the higher animals.

As one of the examples of the earlier phenomena of development I may refer to the change which is perceptible as early as the 18th or 20th hour of incubation in the chick, and which is reproduced in the course of development of every member of the Vertebrate subkingdom. It consists in the formation of cross clefts on each side of the primitive neural cavity, which divide off from each other a number of segments of this wall in the length of the axis of the embryo. At first there are only one or two such clefts; but they rapidly increase in a backward direction in the body of the embryo, and as development proceeds they extend into the tail itself. These are the *protovertebræ* of embryologists—not corresponding, as might at first be supposed, with the true or actual vertebræ which are formed later, but representing in an interesting manner transverse *vertebral segments* of the body, and containing within each the elements of a great part of the structure belonging to the body-wall afterwards to be developed, including the true cartilaginous or osseous vertebral arches and the muscular plates.

This change, however, belongs to the mesodermic

* If we reserve the words ectoderm and endoderm to designate the two layers of the primary bilaminar blastoderm, we may apply the terms epiblast and hypoblast to their derivatives after the formation of the mesoderm, and indicate the relations of the whole to the secondary or quadrilaminar blastoderm by the following table:—

Primary Blastoderm	Ectoderm	.....Epiblast..........	Secondary Blastoderm.
	Meso-derm	Somatopleure ..	
		Splanchnopleure	
	Endoderm	........Hypoblast......	

lamina, and occurs in an elongated thick portion of it, which makes its appearance on each side of the primitive neural canal between the epiblast and the hypoblast. The transverse cleavage is ascertained to commence near what afterwards forms the first cervical vertebra, but does not extend into the base of the cranium. And it is most interesting to note in this cleavage the formation at so early a period of the succession of *metameres* or series of similar parts, which forms a main characteristic of vertebral organization.

As intimately connected with the formation of the vertebral column, the appearance of the chorda dorsalis or *notochord* presents many points of peculiar interest in embryological inquiries.

The notochord is a continuous median column or thread of cellular structure running nearly the whole length of the rudimentary body of the embryo, and lying immediately below the cerebro-spinal canal. It occupies, in fact, the centre of the future bodies of the vertebræ. It exists as a primordial structure in the embryo of all Vertebrates, including man himself and extending down to the Amphioxus, and, according to the remarkable discovery of Kowalevsky in 1866, it is to be found among the Invertebrates in the larva of the Ascidia.*

In Amphioxus and the Cyclostomatous Fishes the notochord, growing with the rest of the body into a highly developed form, acts as a substitute for the pillar of the bodies of the vertebræ, no vertebral bodies being developed; but in Cartilaginous and Osseous Fishes various gradations of cartilaginous and osseous structures come to surround the notochord and give rise to the simpler forms of vertebral bodies, which undergo more and more distinct development in the higher vertebrates. In all instances the substance forming the vertebral bodies is deposited on the surface of or outside the notochord and its sheath, so that this body remains for a time as a vestigial structure within the vertebral bodies of the higher animals.

The observations of Kowalevsky with respect to the existence of a notochord in the Ascidia, which have been confirmed by Kupfer and others, have produced a change little short of revolutionary in embryological and zoological views, leading as they do to the support of the hypothesis that the Ascidian is an earlier stage in the phylogenetic history of the mammal and other Vertebrates. The analogy between the Amphioxus and Ascidian larva is certainly most curious and striking as regards the relation of the notochord to other parts; and it is not difficult to conceive such a change in the form and position of the organs in their passage from the embryonic to the adult state as is not inconsistent with the supposition that the Vertebrates and the Ascidia may have had a common ancestral form. Kowalevsky's discovery opens up at least an entirely new path of inquiry; and we must be prepared to modify our views as to the entire separation of the Vertebrates from the other groups of animals, if we do not at once adopt the hypothesis that through the Ascidian and other forms the origin of the Vertebrates may be traced downwards in the series to the lower grades of animal organization.

The notochord extends a short way forward into the cranial basis; and an interesting question here presents itself, beginning with the speculations of Goethe and Oken, and still forming a subject of discussion, whether the series of cranial or cephalic bones is comparable to that of the vertebræ. On the whole it appears to me that it is consistent with the most recent views of the development and anatomy of the head to hold the opinion that it is composed of parts which are to some extent homologous with vertebral metameres.†

The history of the formation of the vertebral column presents an interesting example of the correspondence in the development of the individual and the race, in that all the stages which have been referred to as occurring in the gradual evolution of the vertebral column in the series of Vertebrates are repeated in the successive stages of the embryonic development of the higher members of the series.

There is perhaps no part of the history of development in the vertebrates which illustrates in a more striking manner the similarity of plan which runs through the whole of them than that connected with what I may loosely call the region of the face and neck, including the apparatus of the jaws and gills. The embryonic parts I now refer to consist of a series of symmetrical pairs of plates which are developed at an early period below the cranium, and may therefore, in stricter embryological terms, be styled the *subcranial plates*.

Without attempting to follow out the remarkable changes which occur in the development of the nose and mouth in connection with the anterior set of these plates (which, from being placed before the mouth, are sometimes named *preoral*), I may here refer shortly to the plates situated behind the mouth which were discovered by Rathke in 1826, and formed the subject of an elaborate investigation by Reichert in 1837.

These plates consist of a series of symmetrical bars, four in number in mammals and birds, placed immediately behind the mouth, separated by clefts passing through the wall of the throat, and each traversed by a division of the great artery from the heart—thus constituting the type of a branchial apparatus, which in fishes and amphibia becomes converted into the well-known gills of these animals; whilst in reptiles, birds, and mammals they undergo various changes leading to the formation of very different parts, which could not be recognized as having any relation to gill-structure, but for the observation of their earlier embryonic condition. The history of this part of development also possesses great interest on account of the extraordinary degree of general resemblance which it gives to the embryos of the most different animals at a certain stage of advancement (so great, indeed, that it requires a practised eye to distinguish between the embryos of very different orders of mammals, and even between some of them and the embryos of birds or reptiles), as well as in connection with the transformations of the first pair of branchial apertures, which lead to the formation of the passage from the throat to the ear in the higher Vertebrata. There is equal interest attached to the history of the development of the first pair of arches which include the basis of formation of the lower jaw with the so-called *cartilage of Meckel*, and which, while furnishing the bone which suspends the lower jaw in reptiles and birds, is converted in mammals into the hammer-bone of the ear.

The other arches undergo transformations which are hardly less marvellous, and the whole series of changes is such as never fails to impress the embryological inquirer with a forcible idea of the persistence of type and the inexhaustible variety of changes to which simple and fundamental parts may be subject in the process of their development.

It is also of deep significance, in connection with the foregoing phenomena, to observe the increase in the number of the gill-bars and apertures as we descend in the scale to the cartilaginous fishes and lampreys, and the still further multiplication of these metameres or repeated parts in the Amphioxus; and it is, perhaps, also interesting to note that in the Ascidia the arrangement of the gills is exactly similar to that of the Amphioxus.

The study of the comparative anatomy of the heart and its mode of formation in the embryo furnishes also

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* 'Mém. de l'Acad. de St. Pétersbourg,' vol. x.

† See the interesting and valuable memoirs of W. K. Parker, 'On the Anatomy and Development of the Vertebrate Skull,' in Trans. of Roy. Soc., the researches of Gegenbaur, Mihalkovics, and more particularly the memoir by F. M. Balfour, 'On the Development of the Elasmobranchs,' in the *Journ. de Anat. and Physiol.*, vols. x. and xi.

most striking illustrations of the relation between ontogenetic and phylogenetic development in the Vertebrates, and is not without its applications to some of the invertebrate groups of animals.

I need only recall to your recollection the completely double state of this organ in warm-blooded animals, by which a regular alternation of the systemic and pulmonary circulations is secured, and the series of gradations through the class of Reptiles by which we arrive at the undivided ventricle of the amphibian, and the further transition in the latter animals by which we come at last to the single heart of fishes; and to state that in the embryo of the higher animals the changes by which the double heart is ultimately developed out of an extremely simple tubular form, into which it is at first moulded from the primitive formative cells, are, in the inverse order, entirely analogous to those which I have just now indicated as traceable in the descending series of vertebrate animals; so that at first the embryonic heart of man and other warm-blooded animals is nothing more than a rhythmically contractile vascular tube. By the inflection of this tube, the constriction of its wall at certain parts, and the dilatation at others, the three chambers are formed which represent the single auricle, the single ventricle, and the aortic bulb of the fish. By later changes a septum is formed to divide the auricles, becoming completed in all the air-breathing animals, but remaining incomplete in the higher animals so long as the conditions of fœtal life prevent the return of arterialized blood to the left auricle. The growth of another septum within the ventricular portion gradually divides that cavity into two ventricles, repeating somewhat in its progress the variations observed in different reptiles, and attaining its complete state in the crocodile and warm-blooded animals.

I must not attempt to pursue this interesting subject further; but I cannot avoid making reference to the instructive view presented by the embryological study of the nature of the malformations to which the heart is subject, which, as in many other instances, are due to the persistence of transitory conditions which belong to different stages of progress in the development of the embryo. Nor can I do more than allude to the interesting series of changes by which the aortic bulb, remaining single in fishes and serving as the channel through which the whole stream of blood leaving the heart is passed into the gills, becomes divided in the higher animals into the roots of the two great vessels, the aorta and the pulmonary artery, and the remarkable transformations of the vascular arches which proceed from the aortic bulb along the several branchial arches, and which, in the gills of fishes and aquatic Amphibia, undergo that minute subdivision which belongs to the vascular distribution of gills, but which in the higher non-branchiated animals are the subject of very different and various changes, in the partial obliteration of some and the enlagement of others, by which the permanent vessels are produced.

These changes and transformations have for many years been a subject of much interest to comparative anatomists, and will continue to be so, not only for their presenting to us one of the most remarkable examples of conformity in the plan of development and the type of permanent or completed organization in the whole series of vertebrated animals, but also because of the manifest dependence of the phenomena of their development upon external influences and atmospheric conditions which affect the respiration, nutrition, and modes of life of the animal.

Nor is the correspondence to which I now refer entirely limited to the Vertebrata. For here, again, through the Amphioxus and the Ascidia, we come to see how an affinity may be traced between organs of circulation and respiration which at first appear to belong to very different types. The heart of vertebrates is, as is well known, an essentially concentrated form of vascular development in the ventral aspect of the body, while the heart of the invertebrate, whether in the more concentrated form existing in the Articulata and Mollusca or in a more subdivided shape prevalent in the Annelida, is most frequently dorsal; yet the main aorta of the Vertebrates is also dorsal; and it is not impossible, through the intermediate form of Amphioxus, to understand how the relation between the Vertebrate and the Invertebrate type of the blood-vascular system may be maintained.

But I am warned by the lapse of time that I must not attempt to pursue these illustrations further. In the statement which I have made of some of the more remarkable phenomena of organic production—too long, I fear, for your endurance, but much too brief to do justice to the subject—it has been my object mainly to show that they are all more or less closely related together by a chain of similarity of a very marked and unmistakable character; that in their simplest forms they are indeed, in so far as our powers of observation enable us to know them, identical; that in the lower grades of animal and vegetable life they are so similar as to pass by insensible gradations into each other; and that in the higher forms, while they diverge most widely in some of their aspects in the bodies belonging to the two great kingdoms of organic nature, and in the larger groups distinguishable within each of them, yet it is still possible, from the fundamental similarity of the phenomena, to trace in the transitional forms of all their varieties one great general plan of organization.

In its simplest and earliest form that plan comprises a minute mass of the common nitrogenous hydrocarbon compound to which the name of protoplasm has been given, exhibiting the vital properties of assimilation, reproduction, and irritability. The second stage in this plan is the nucleated and enclosed condition of the protoplasmic mass in the organized cell. We next recognize the differentiation of two productive elements, and their combination for the formation of a more highly endowed organizing element in the embryonic germ-sphere or cell; and the fourth stage of advance in the complexity of the organizing phenomena is in the multiplication of the fertilized embryo-cell and its conversion into continuous organized strata, by further histological changes in which the morphological foundations of the future embryo or new being are laid.

I need not now recur to the further series of complications in the formative process by which the bilaminar blastoderm is developed and becomes trilaminar or quadrilaminar, but only recall to your recollection that while these several states of the primordial condition of the incipient animal pass insensibly into each other, there is a pervading similarity in the nature of the histological changes by which they are reached, and that in the production of the endless variations of form assumed by the organs and systems of different animals in the course of their development, the process of cell-production, multiplication, and differentiation remains identical. The more obvious morphological changes are of so similar a character throughout the whole, and so nearly allied in the different larger groups, that we are led to regard them as placed in some very close and intimate relation to the inherent properties of the organic substance which is their seat, and the ever-present influence of the vital conditions in which alone these properties manifest themselves.

The formative or organizing property therefore resides in the living substance of every organized cell and in each of its component molecules, and is a necessary part of the physical and chemical constitution of the organizing elements in the conditions of life; and it scarcely needs to be said that these conditions may be as varied as the countless numbers of the molecules which compose the smallest particles of their substance. But, setting aside all speculation of a merely pangenetic kind, it appears to me that no one could have engaged in the study of embryological development for any time without becoming convinced that the phenomena which have been ascertained as to the first origin and formation of textures and organs in any individual animal are of so uniform a character as to indicate forcibly a law of connection and continuity between them; nor will his study of the phenomena of development in different animals have gone far before he is equally strongly convinced of the similarity of plan in the development of the larger groups, and, to some extent, of the whole. I consider it impossible therefore for any one to be a faithful student of embryology, in the present state of science, without at the same time becoming an evolutionist. There may still be many difficulties, some inconsistencies, and much to learn, and there may remain beyond much which we shall never know; but I cannot conceive any doctrine professing to bring the phenomena of embryonic development within a general law which is not, like the theory of Darwin, consistent with their fundamental identity, their endless variability, their subjugation to varying external influences and conditions, and with the possibility of the transmission of the vital conditions and properties, with all their variations, from individual to individual, and, in the long lapse of ages, from race to race.

I regard it therefore, as no exaggerated representation of the present state of our knowledge to say that the ontogenetic development of the individual in the higher animals repeats in its more general character, in many of its specific phenomena, the phylogenetic development of the race. If we admit the progressive nature of the changes of development, their similarity in different groups, and their common characters in all animals, nay, even in some respects in both plants and animals, we can scarcely refuse to recognize the possibility of continuous derivation in the history of their origin; and however far we may be, by reason of the imperfection of our knowledge of Palæontology, Comparative Anatomy, and Embryology, from realizing the precise nature of the chain of connection by which the actual descent has taken place, still there can be little doubt remaining in the minds of any unprejudiced student of embryology that it is only by the employment of such an hypothesis as that of Evolution that further investigation in these several departments will be promoted, so as to bring us to a fuller comprehension of the most general law which regulates the adaptation of structure to function in the Universe.

Address to the Chemical Section.

BY PROFESSOR ABEL, F.R.S.

President of the Section.

Section B (Chemical Science) met on Thursday, August 16th, when the proceedings were opened by the following Address from its President:—

The subject which my predecessor, in the honourable position of President of this Section, made the chief topic of his interesting and instructive address, affords excellent illustrations of the operation of purely scientific research in creating and developing important branches of industry. Mr. Perkin, whose name has from the very commencement of the history of coal-tar colours been identified with their discovery and their scientific and technical history, referred to several series of researches, each one of which formed a link in a chain of discoveries in organic chemistry of the highest value as establishing, illustrating, or extending important chemical theories, but at the time, and for long afterwards, of value purely from a scientific point of view. These researches, undertaken and pursued by ardent and philosophical investigators under more or less formidable difficulties, and solely in the interests of science, resulted in the discovery of certain organic bodies which were produced originally only on a very small scale and at great cost, but which, after the lapse of years, have been readily manufactured from abundant sources, and have constituted important elements in the development of the industry of artificial colouring matters. In fact this industry, which owes its origin to the discovery of mauve by Mr. Perkin about twenty years ago, and which is second to no branch of chemical industry in regard to the rapidity of its development and its influence upon other important branches of manufacture, affords more copious illustrations than any other of the immediate influence of pure science upon industrial progress. It therefore affords a topic which the chemist may well be excused for continually recurring to, with an interest bordering on enthusiasm, when illustrating the material advantages which accrue to communities from the promotion of scientific training and the encouragement of chemical research.

The iron-and-steel industry presents a great contrast to that of the artificial colours in regard to the extent of influence which the labours of purely scientific investigators have exerted upon its development. The efforts of scientific men to unravel such problems as, for instance, the true chemical constitution of steel, or the precise differences between the various combinations known as cast iron, and the conditions which determine their individual production or conversion from one to another, have hitherto been attended by results not at all proportionate to the patient experimental investigation of which from time to time they have been made the subject. Thus, the protracted experiments and discussion carried on by Frémy and Caron, some years back, with reference to the dependence of the characteristics of steel upon the existence in it of nitrogen, cannot be said to have led to results of a more conclusive or even definite nature regarding the conditions which regulate the production, composition, and properties of steel than those arrived at by previous distinguished experimenters; and the same must be said, with respect to cast iron, of such experiments as those carried on for several years by Matthiessen (in which I also took some part) under the auspices of the Association, with the view to eliminate many existing points of doubt regarding the chemical constitution of cast iron, by preparing chemically pure iron and studying its combination with carbon and other elements occuring in cast iron.

The prosecution of purely scientific investigation may, therefore, of itself fail to bear *direct* fruit in regard to the development of new metallurgic achievements, or even to the elucidation of the comparatively complicated and numerous reactions which occur in furnaces, either simultaneously or in rapid and difficultly controllable succession, between materials composed of a variety of constituents in variable proportions. There can, however, be no question regarding the important benefits which have accrued from the application of chemical knowledge to the study and the perfection of furnace-operations, by those who happily combine that knowledge with practical experience, and with the power of putting to the test of actual practice the results of reasoning upon an intelligent observation of the phenomena exhibited in such operations, and upon the data which chemical analysis has furnished. In the hands of such men, the scientific results arrived at by Karsten, Berthier, Bunsen, Scheerer, Percy, and other eminent investigators, acquire new value, and by them the fruits of the labours of the patient toiler at analytical processes meets with that appreciation which their solid and permanently valuable work does not always command at the hands of their numerous brother-workers in chemical science who follow the far more attractive paths of organic research.

Naturally, the brilliant results achieved from time to time by investigators in organic chemistry, the rapidity with which, by those results, theories are established or extended, types founded, their offspring multiplied, and their connection with other families traced and developed, impart to organic research a charm peculiarly its own. This, and the general ease with which new results are obtained by the pursuit of methods of research comparatively simple in their nature and few in kind, have for many years not only secured to organic chemistry an overwhelming majority of workers; they also appear to have had a tendency to lead the younger labourers in the field of organic research to under estimate the value and importance, in reference to the advancement of science, of the labours of the plodding investigator of analysis. Yet no higher example can be furnished of the patient pursuit of scientific work, purely for its own sake, than that of the deviser or improver of analytical processes, who, undeterred by failure upon failure, indefatigably pursues his laborious work, probing to its foundation each possible source of error, carefully comparing the results he obtains with those furnished by other methods of analysis, and patiently accumulating experimental data till they suffice fully to establish the value and trustworthiness of the process which he then publishes for the benefit of his fellow-workers in science. Truly the results of such labours do not stand in unfavourable contrast, from whatever light they may be viewed, to those of the investigator of organic chemistry. It is not to be denied that the labourer at organic research may, so far as the analytical work which should fall to his share in the course of his investigations is concerned, be tempted to reduce this, the least attractive portion of his work, to within the smallest possible limits; and having, for example, by a boiling-point determination, or a single analytical operation of the simplest kind, such as the examination of a platinum-salt, obtained a numerical result approximating to that which his theory demands, may hasten on to the further development of his airy structure, possibly not without risk to its stability. Unquestionably there are instances of frequent occurence, in the pursuit of a particular line of organic research, in which more is not required than the identification of a particular product by some such simple means as above indicated. It is certain, moreover, that the labours of the organic investigator also not unfrequently afford bright examples of indomitable perseverance under formidable difficulties, and this alone should constitute a strong bond of union between the worker in organic research and his brother-worker in analytical chemistry, if one did not already exist in the active interest which each, if a true lover of science, must take in the work of the other.

It has been remarked by one of the most distinguished investigators, and at the same time, one of the most brilliant lecturers and successful teachers of our time, that the contrivance of a new and good lecture experiment may rank in importance with the preparation of a new organic compound; and it may certainly be said with equal truth that the elaboration of a new and good method of analyis may rank in importance with a good research in organic chemistry, in reference both to the part it plays in the advancement of science and to its influence upon industrial progress.

An excellent illustration of this is afforded by reference to the Proceedings of the British Association when it met in this town thirty-six years ago. In a letter to Dr. Playfair, Liebig, who took a very active part in the proceeedings of the Association in the earlier years of its existence, reports that Doctors Will and Varrentrapp have devised an excellent method for determining the amount of nitrogen in organic bodies, "very exact and easily performed." He then describes in a few lines the process so well known to chemists, which not only has been, and continues to be, invaluable to those engaged in organic research, but which, as may be testified by such researches as those Lawes and Gilbert, has born a most important and indispensable part in the advancement of agricultural chemistry. It is, I believe, but an expression of the unanimous conviction of chemists to say that the achievements in analytical chemistry of such men as Berzelius, Heinrich Rose, and Fresenius, take equal rank with the brilliant researches and theoretical expositions of such chemists as Liebig, Laurent, Gerhardt, and Berthelot, and that of all the important contributions to the development of organic chemistry which we owe to Liebig, there is none which has exerted so great an influence on the progress of this branch of chemical science as his beautifully simple method of organic elementary analysis.

Reverting to the industry of iron and steel, which, in regard to some of its most important branches, cannot fail to be a subject of special interest in Plymouth and Devonport, it is not difficult to demonstrate that the labours of the analytical chemists have exercised, and continue to exert, an important influence on the very considerable advance which has in recent years been made, and still proceeds, towards securing complete control over the quality and character of the products obtained. The epoch is well within the recollection of chemists of my generation when the British iron-master first awoke to the benefits which might accrue to him from an application of the labours of the analytical chemist in connection with iron-smelting. When the last great stride was made in the manfacture of cast iron, by the introduction of the hot blast, the iron-smelter was naturally led to seek profit, to the fullest extent, with respect both to the great increase in the rate of production of pig iron attainable thereby, and to the economy achievable in regard to the proportions and characters of the materials employed in the production of pig-iron. But after a time, the great falling off in the quality of a large proportion of the products of the blast furnace, and the difficulties experienced in the production of malleable iron of even very moderate quality, aided by the great impetus to competition in respect of quality given by the first International Exhibition in 1851, directed the attention of our more enlightened iron-masters to the likelihood of their deriving important aid from chemical science, and more especially from the investigations of the analytical chemist.

Among the earliest to realize the importance of trustworthy and detailed information regarding the composition of the iron ores of the country was Mr. S. H. Blackwell, who in presenting to the Royal School of Mines a very extensive and interesting series of British ores, which he had collected with great labour and expense for exhibition in 1851, placed at the disposal of Dr. Percy the requisite funds for engaging the services of competent analysts (Messrs J. Spiller and A. H. Dick), who, under his direction, and with subsequent pecuniary aid from himself and from Government funds, carried out a very careful and complete examination of this series, the results of which have been of great value for purposes of reference to those actively interested in the iron industry. It was, however the first connection of Messrs. Nicholson and D. S. Price, and of Mr. E. Riley, with two of the most important iron works of this country about a quarter of a century ago (*i.e.*, at the time when the above investigation was commenced), that marked, I believe, the commencement of systematic endeavours to apply the results of analytical research to the improvement and regulation of the quality of the products of our iron works.

It is, perhaps, but natural that the primary object sought by application of the knowledge of the analytical chemist should have been to eliminate or reduce the existing elements of uncertainty in obtaining the most abundant yield of pig iron capable of conversion into railway bar sufficiently good to meet the minimum standard of quality, and to reduce still further the cost of production of such bar iron, by utilizing material concerning the composition of which (richness in iron, etc.) the iron smelter was completely in the dark. The information accumulated by the analyst respecting the composition of the ores, fuel and fluxes available at the works, and the composition of the pig iron and slags (or cinders) produced under varied conditions, in regard to materials employed and to the proportions of ore, fuel and flux used in the blast furnace, could not, however, exist long without exerting a marked beneficial influence upon the quality of the iron produced, and generally upon the iron industry of the country.

Percy's invaluable work of reference on metallurgy furnishes abundant evidence of the scientifically interesting, as well as practically useful, nature of the results obtained at that time by the chemists above named, and others working under Dr. Percy, with respect both to the elaboration of important analytical processes (in which direction Mr. Riley has continued to the present day to do valuable work), and to the elucidation of the reactions occurring in the processes of reduction and refining of the metal. It is needless to dwell upon the fact that the aid of the analyst has now long since become absolutely indispensable to the iron and steel manufacture, but I may perhaps be allowed briefly to refer to one or two recent illustrations of the indispensable part which analytical research has played and continues to play in the extension of our knowledge of the chemical reactions involved in the production of cast and wrought iron and of steel, and of the influences which the chief associates of iron in its mercantile forms exert upon its physical characters.

Among the many valuable communications made to that most important body, the Iron and Steel Institute of Great Britain, by men who combine great practical knowledge and experience in iron and steel manufacture with high attainments in mechanical science, and such knowledge of chemical science as ensures a full appreciation of its value at their hands, one of the most interesting and suggestive to the chemist is that on the separation of carbon, sulphur, silicon and phosphorus in the refining and puddling furnace, and in the Bessemer converter, contributed to the Transactions of the Institute's recent meeting by Mr. Lowthian Bell, whose valuable investigations in connection with the iron industry are as interesting to the chemist as they are useful to the manufacturer. Mr. Bell has brought together the results of an extensive series of practical experiments on the treatment of different kinds of pig iron of known composition in the finery, in the puddling furnace, and the Bessemer converter, and, by comparing the results of analytical investigation of the products of those experimental operations with each other and with those of the materials operated upon, he has obtained valuable confirmation of the views already held by metallurgic chemists, regarding the succession in which carbon, silicon, sulphur, and phosphorus are attacked when pig metal is submitted to the above purifying processes, and the extent to which these foreign associates of iron are abstracted, or resist removal, by the more or less thorough application of those several modes of treatment. He has also thrown new light on the reason why the most difficultly assailable impurity, phosphorus, obstinately resists all attempts to effect even a slight diminution in its amount, by application of the Bessemer treatment. The earnestness with which Mr. Bell wages war against this enemy of the ironmaster, in one of its most favourite haunts, the Cleveland District, not simply with the old British pluck which acknowledges not defeat, but systematically, on scientific principles, calling to his aid all the resources which the continual advances in applied mechanical and chemical research place within his reach, cannot fail to contribute importantly, if it does not of itself directly lead, to the complete subjection of this most intractable of the associates to which iron becomes linked in the blast furnace. Indications have lately not been wanting that the existence of phosphorus in very notable proportions in iron may not of necessity be inimical to its conversion into steel of good quality, and it may be that this element, which is now turned to useful account to impart particular characteristics to the alloys of copper and tin, is even destined to play a distinctly useful part in connection with the production of steel possessed of particular characters, valuable for some special purposes.

In the great development which steel manufacture has received within the last few years, one most prominent feature has been the production with precision, upon a large scale, of steel of desired characteristics in regard to hardness, etc., by first adding to fluid cast-iron of known composition the requisite proportion of a rich iron-ore (with or without the addition of scrap-iron), to effect a reduction of the carbon to the desired amount, concurrent with a refining of the metal by the oxidizing action of the ore, and then giving to the resulting steel the desired special qualities by the addition of suitable proportions of iron-compounds of known composition, rich in manganese and carbon (spiegeleisen and the similar product called ferro-manganese). The germ of this system of producing steel-varieties of predetermined characteristics, exists in crucible processes like that of Uchatius which have been in more or less extensive use for many years past; but it is to such invaluable arrangments as are most prominently represented in the Siemens-Martin furnace, wherein several tons of metal may be fused and maintained at a very high temperature with as little liability to change from causes not under control as if the operation were conducted in a crucible, that we are indebted for the very great expansion which the direct application of the analytical chemist's labours to the development of the steel industry is now receiving.

The production of steel upon the open hearth, to the elaboration of which Dr. C. W. Siemens has so largely contributed, since he first established the process at Llandore in 1868, has, in fact, become assimilated in simplicity of character and precision of results to a laboratory operation, and may be justly regarded as a triumph of the successful application of chemical principles, and of the power of guidance and control afforded by utilizing analytical research to the attainment of prescribed results upon a stupendous scale, with an accuracy approaching that which the experienced chemical operator secures in the laboratory upon a small scale, under conditions which he can completely control. The production of steel by a large number of small separate operations in pots has now become supplanted with great advantage by the Siemens-Martin system of working at some of our largest establishments at Sheffield; this system has also secured a footing at highly renowned continental works, which are formidable competitors with us in the manufacture of steel, such as those of Essen, Creusot, and Terrenoire. It is specially interesting to notice that, in the hands of those who, on the Continent at least equally with ourselves, have learned to combine the results of practical experience, with the teachings of chemical science, the facilities now existing for dealing in a single receptacle with large masses of fluid steel, have greatly facilitated the application of chemical means to the production of *solid* masses of considerable size, thereby reducing, if not altogether dispensing with, the necessity for submitting large steel castings to costly mechanical operations, with the object of closing up cavities caused by the escape of occluded gas as the liquid metal cools. The success in this direction which appears to have attended the addition of silicon, in combination with iron and manganese, to the steel before casting; in preventing the formation of so-called *blow-holes*, and in contributing at the same time to the production of the particular character of steel required, bids fair to be of special importance in connexion with the application of steel to the production of projectiles for use against armour-plates, as affording ready and comparatively very economical means of ensuring the production of perfectly sound castings, which, in compactness of structure will, it is asserted, compete successfully with carefully forged castings, and even with the magnificent material which Whitworth produces by submitting the fluid metal to powerful pressure.

The part which silicon plays, by its comparatively high susceptibility to oxidations in promoting the production of sound steel-castings, is readily intelligible; but the functions of the manganese compounds, which are an indispensable adjunct to the Bessemer process, and the application of which has become an integral part of steel-manufacture, are still far from being thoroughly understood, and there is ample scope for chemical research, in co-operation with practical experiment, in the further study of the influence, not only of manganese in the production and upon the properties of steel but also of elements such as titanium, tungsten, and boron, and of chromium, which exists, associated in considerable quantites with iron, in a very abundant Tasmanian ore, to which prominent attention has lately been directed. The achievements of the mechanical engineer have so facilitated the handling and perfected the means of production and the mechanical treatment of malleable iron and of steel, that the full advantage may now be reaped of any improvement of a chemical nature which may be effected in the production of these materials, and it must be a source of pride to the chemist to observe with what success the teachings of his science are being applied by practical men of the present day in the construction of furnaces capable of withstanding the high temperatures required for the production and working of iron and steel in large masses, and in combining the perfect consumption and consequent great economy of fuel with the attainment of those high temperatures, and with a thorough control over the character of the gaseous agents to which the fluid metal is exposed in the furnace. I need not quote the names of those men who have already rendered themselves prominent by their services in this particular direction, but may refer, in special illustration of the results achieved by purely practical men, to the success in applying very simple furnace-arrangements to the attainment of the above results which has recently attended the labours of Mr. William Price, a principal foreman in the royal gun factories at Woolwich.

A few of the experiments made in the early days of the application of armouring to ships and forts appeared to demonstrate, on the one hand, that steel was quite incapable of competing with malleable iron, of even very moderate quality, as a material for armour-plates ; and, on the other hand, that the penetrative power of projectiles made of chilled iron, upon the Palliser system, could not be surpassed, or even attained, with any degree of certainty, by projectiles of steel, produced at comparatively very great cost. But some recent results obtained on the Continent, and especially in the course of the important experiments instituted by the Italian Government at Spezzia, have afforded decisive indications that steel, the application of which to the construction of ordnance has since that time been very greatly extended may now be looked to hopefully as capable of affording greater protection against the enormous projectiles of the present day than can be secured by proportionately large additions to the stupendous iron-armouring of the most modern iron-clads, and also as applicable, at a cost very moderate when compared with that of ten years ago, to the production of projectiles of large dimensions superior in point of penetrative power, and of uniformity in this respect, to those of chilled iron, the difficulties in the production of which are very greatly increased by the formidable increase which has lately been made in their size. Promising results have also quite recently been obtained at Shoeburyness, with a new system of applying steel in conjunction with malleable iron, by which a perfect union of masses between the two materials at one of their surfaces is effected by the aid of heat.

The superiority of soft and very homogeneous steel over wrought iron of the best quality in regard to lightness, combined with strength and toughness, are leading to its very advantageous employment in the construction of a particular class of vessels for the navy, and the perfect confidence which can be placed in the uniformity, in structure and strength, of steel of such character as is produced by the Whitworth system of manufacture, has greatly facilitated the production of air chambers of small weight, but capable of being quite safely charged with sufficient air, under a pressure of 1000 lb. on the square inch, to carry the Whitehead torpedo through water to the distance of a thousand yards in little more than a minute and a half.

Thus the results of the recent development of the steel-industry, to which the labours of the chemist have not unimportantly contributed, give promise of exerting a great influence upon the resources of nations for defence and attack. Although the necessity for the continual expansion of such resources cannot but be deeply deplored, there can be no doubt that the problems which it presents, and the special requirements to which it gives rise, must operate, and perhaps as importantly as the demands created by peaceful industries and commercial enterprise, in encouraging the metallurgist, the chemist, and the engineer to continue their combined work in following up the successes, to the achievement of which the results of scientific research have greatly though indirectly contributed.

If it were necessary to add to the illustrations which Mr. Perkin gave in his Address last year of the practical fruits of research in *organic* chemistry, I might be tempted to dilate upon the important results which have, especially during the last ten years, grown out of the discovery and study of the products of the action of nitric acid upon cellulose and glycerine. During the six years which have elapsed since I had the honour of bringing before the members of the British Association the chief points of scientific interest and practical importance presented by the history of those remarkable bodies, their application to technical and war purposes has been greatly developed. Nitroglycerine and gun-cotton may now be justly classed among the most interesting examples of the practical importance frequently attained by the results of chemical research, while the history of the successive steps by which their safe manipulation and efficient application have been developed affords more than one striking illustration of the achievements effected by combined physical and chemical research, in the solution of problems of high scientific interest and practical importance, and in the vanquishment of difficulties so formidable as, for a time, to appear fatal to the attainment of permanently practical success.

It is to a careful study of the influence which the *physical* characters of gunpowder (its density, hardness, &c.) and its *mechanical* condition (*i.e.* form and size of the masses and condition of their surfaces) exert upon the rapidity of the explosion under confinement, that we chiefly owe the very important advance which has been made of late years in controlling its explosive force, in its application as a propelling agent, and the consequent simple and effectual means whereby the violence of action of the enormous charges now used in siege- and ship-guns is effectually reduced to within their limits of endurance, without diminution of the total explosive force developed. But, concurrently with these important practical results, the application of combined chemical and physical research to a very extended and comprehensive investigation of the action of fired gunpowder, has furnished results which possess considerable interest from a purely scientific point of view, as in many respects modifying, in others supplementing, the conclusions based upon earlier experiments and theoretical considerations with respect to the nature and proportions of the products formed, the heat developed by the explosion, the tension of the products of combustion and the conditions which regulate it, both when the explosion is brought about in a close vessel and when it occurs in the bore of a gun. The results of these physico-chemical researches have, moreover, already acquired practical importance in regard to the light they have thrown upon the influence exerted by variable conditions of a mechanical nature upon the action of, and pressure developed by, fired gunpowder in the bore of a gun, and in demonstrating that modifications in the *composition* of gunpowder, not unimportant from an economical point of view in dealing with the very large charges now employed, may importantly contribute to render the storing of the maximum of work in the projectile, when propelled from a gun, compatible with a subjection of the gun to comparatively very moderate and uniform strains.

Other interesting illustrations of the intimate manner in which physical and chemical research are linked together, and of the important extent to which some of our most illustrious workers in chemistry have contributed to demolish the semblance of a barrier which existed in past times between the two branches of science, are furnished and suggested by the recently published list of grants of money which the Government has made to scientific men on the recommendation of the Royal Society, from the fund, which, for the first time last year, was added to the very modest sum previously accorded from national resources in support of research. The perusal of that list, representing as it does, a most carefully considered selection by the highest representatives of science in the country, from a very large number of applications, affords important evidence, on the one hand, of the active pursuit of science in Great Britain and, on the other, of the very wide range of subjects of interest and importance, the full investigation of which demands the provision of adequate resources. That the necessity for such resources needs but to be thoroughly made known to ensure their provision, even from other than national sources, has been demonstrated by the success which, in a comparatively brief space of time, has attended the efforts of the Chemical Society to establish, upon the foundation patriotically laid by one of its original members, Dr. Longstaff, a special fund, to be administered by the Society, for the advancement of chemical science. An inspection of the list of contributors to this special fund in aid of chemical research which, in about two years, has reached the sum of four thousand pounds, and from the proceeds of which the first applications for grants have recently been met, is suggestive of two observations; one is, that the proportion and amount of contributions hitherto received are comparatively small from the source whence the greatest support of such a fund may naturally be looked for, namely, from those who most directly benefit by the results of chemical research. It is to be hoped that there are many prominent representatives of the chemical and metallurgic industries in this country who still intend to give practical effect to their natural desire to aid in the advancement of chemical science, and to the appreciation which they can hardly fail to entertain of the usefulness of this fund. On the other hand, it is a matter well meriting special notice that a very prominent section of the contributors to the fund is composed of some of the most ancient corporate bodies of the city of London. Most welcome evidence is thereby afforded of the readiness with which the city companies are prepared to respond to appeals for the substantial support of measures well calculated to promote progress in science. This evidence, and the combined action which they are even now contemplating for promoting the application of scientific research to the advancement of industry and commerce, by establishing an institution for technical education upon a scale worthy to serve as a monument of the true usefulness of wealthy confederations, must be cordially hailed as very substantial proofs that these representatives of our national wealth and commercial supremacy are entering upon a new sphere of activity which will more than restore their ancient prestige, by according them a new rank, more elevated than any which their civil importance could, in the past or future, confer upon them,—a rank high among the chief promoters of our national enlightment.

Parliamentary and Law Proceedings.

The Manufacture of Soda Water.

At the Cambridge Police Court, last week, Mr. John Yeomans, chemist and druggist, Petty Cury, was charged with selling as soda water a mixture which was adulterated.—Mr. Apjohn, public analyst, certified that two samples contained ·16 grains of copper in the gallon, and also a minute quantity of lead, but no soda (sodium bicarbonate). In his opinion soda water containing this quantity of copper and lead was injurious to health.—The defendant said he paid great attention to the manufacture, and the vessels were tin lined to prevent contamination. Every care was taken. He made the soda water of different strengths of soda according to the requirements of the public. If he put in sufficient soda to satisfy the analyst with the Cambridge water they would have a soapy compound, and this the public did not like.—The Magistrates' Clerk said it was not a question of degree here, but of total absence.—The Defendant said that if he put in 15 grains of soda he should not please the public.—The Magistrates' Clerk: You should not call it soda water, but Yeoman's popular mixture —Mr. Balls (one of the magistrates) said the serious part of it was that, while being devoid of soda, the liquid contained copper and lead, which were certified to be injurious to health.—Defendant said he did not know how they came there. —The Magistrates inflicted a penalty of £5.—*Standard.*

Poisonings by Carbolic Acid.

An inquest was held on Friday, August 17, by the Liverpool borough coroner, on the body of Rosannah Connolly, aged forty-two, wife of a labourer living in Chaucer Street. It appeared that the deceased's husband had obtained some carbolic acid as a lotion to apply to a sore leg with which he was afflicted. On Wednesday last the deceased, mistaking the carbolic acid for water, drank some of it out of a cup, and died soon afterwards. A verdict of "Accidentally poisoned," was returned.

A similar mistake occurred at the Prescot Workhouse, on the 14th inst., by which an inmate in the smallpox ward, named William Sharkey, of St. Helens, lost his life. The doctor had ordered him the usual course of medicine necessary in smallpox cases, and on the above date, one of the paupers brought a bottle of carbolic acid, out of which a dose was mixed and administered by the nurse, instead of out of the correct medicine bottle. Sharkey at once became insensible, and died in half-an-hour. An inquest was held yesterday, before Mr. Driffield, at the Union Workhouse, and the jury returned the following verdict:—"The deceased died from a dose of carbolic acid, given in mistake by the nurse in his medicine," and accorded censure, by "considering that there was great neglect in the case in not having every bottle labelled, and thereby avoiding such sad mishaps."—*Liverpool Daily Post.*

Poisoning by "Battle's Vermin Killer."

On Thursday, August 16, an inquest was held at Butts, before Mr. T. Dewes, coroner, touching the death of Harriet Maria Jennings.

Dr. Read said he was called to the deceased on the previous day, and found her dead in a sitting position on the sofa. From his own observation and the certificate of the analyst, he had no doubt deceased was poisoned by strychnine, of which Battle's Vermin Killer is principally composed.

Mr. Frederick John Barrett, F.C.S. (from Wyleys and Co.), presented his certificate, which was as follows: "Received from Inspector Elms a jar containing a stomach, a teacup containing a blue powder adhering to its sides, with an opened paper envelope marked 'Battle's Lincoln Vermin Killer, Poison.' I hereby certify that I have examined the contents of the stomach, with the following results:—The coats of the stomach appeared much inflamed and contained about five drachms of a thick grumous liquid, much of which was adhering to the sides. I separated some few particles of a pigment resembling Prussian blue. The contents of the stomach, upon chemical analysis, I found to contain strychnia—in the proportion of nearly one grain. No other poisons were present."

The jury returned a verdict that the deceased died from the effects of strychnine contained in Battle's Vermin Killer, self-administered, but that there was no evidence to show the state of mind in which she was at the time.

Dispensing Memoranda.

*We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be conidered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.—**See p. 144.*

[16]. Should think *Tr.* Capsici was intended instead of the *Pulv.*—W.

[17]. Make as follows:—

Pulv. pro Pil. Rhei Co. . . . ʒij
Pulv. Tragac. . . . . ʒj
Pulv. Ext. Coloc. Co. . . . ʒj
Ext. Hyoscy. (pilular consist.) ʒj
Pil. Hyd. Subchlor. Co. . . . ʒj
Ol. Carui . . . . gtt. 24.—W.

[17]. Pill Query—Use—

Pulv. Ext. Coloc. Co. and
Pulv. Rhei Co.

and make the mass with a little Liq. Potassæ.

G.

[17]. A Pill Query.—Dry the ox-gall over a steam-bath until it will rub down into powder. Allow for the loss in weight and make into pills with tragacanth mucilage. These will not fall.—H. C. Baildon.

[18]. Heat ox-gall to dryness and powder; add a few grains of Pulv. Tragacanth. and beat up with the smallest quantity of water.—W.

[18]. In answer to X. Y. Z., I have always found that purified ox-gall pills may be made so as to keep their shape for weeks by using Fell. Bovin. evaporated to a hard pill consistence, and adding a fourth its weight of powdered tragacanth. If another extract be ordered in the pill it is necessary to further evaporate the mass, rolling into pills while warm. I have not found it necessary to keep the pills in a bottle, when prepared as above, and the coating of tolu, though desirable for other reasons, is not necessary to the retention of shape.

W. T.

[19]. CINCHONINE PREPARATIONS.—

℞ Sp. Am. Aromat. . . ʒvj
Eth. Chlor. . . . . ʒiv
Syr. Cinchon. . . . . ʒiv
Vin. Ferri . . . . ad ℥viij M.

The above has been dispensed in several places with different results as to taste and appearance; that sent out from the prescriber's own establishment pleasing the patient best, because, though containing a "bulky sediment," it was "by far the sweetest." Will some one oblige with a good formula for "Syr. Cinchon.;" or, if any, that recognized in leading houses?—G. W. W.

[20]. Last week a gentleman presented the following prescription to be dispensed at my establishment. He saw it when finished and asked if everything had been put in it, as he had it dispensed at a well-known house (whose stamp it bore), and it was a thick opaque mixture. Perhaps you or some of your readers can account for this, or say what appearance it ought to have:—

℞ Potassii Bromidi,
Ammon. Bromidi . āā ʒij
Æther Chlorici . . . ʒj
Tinct. Aurantii . . . ʒij
Aqua Caryophylli . ad ℥xij

M. Ft. mist.—A twelfth part twice a day.

Ph. Chemist

[21]. APOTHECARIES' OR AVOIRDUPOIS?—Can any reader inform me if in dispensing a prescription containing a powder of which, say, one ounce is ordered thus—

Bismuth. Subnit. . . . ℥j

the avoirdupois or apothecaries' ounce should be used?—Difficultas.

[22]. KEEPING LEECHES.—Can any correspondent tell me how to preserve leeches alive? I have tried filtered water, spring water, and rain water; kept them in a cool place, in the dark, and in a moderate light. I put pebbles and weeds in the water, and change the water every day, but still they die off at the rate of about four a week.—F. F. Hoddinott, Barnet.

[*⁎* Several methods have already been suggested in the present series of this Journal (see for instance, vol. vi., pp. 260, 460, and 700). Perhaps the insertion of this query may bring out further experience on this subject.—Ed. P. J.]

Correspondence.

⁎ *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Counter Practice.

Sir,—There are few, I think, who like myself were unavoidably absent from the Conference just concluded in the beautiful town of Plymouth, but must have felt great pleasure in reading the President's address, touching as it does so gently, and yet so clearly and nicely, on the subject of counter prescribing.

Obviously this subject has been for a long time coming to a head, and it is clearly necessary therefore that an understanding should be arrived at with regard to it.

The time perhaps could not have been more opportune, judging from all things, than the present, when the Pharmaceutical Society and the medical profession are on such amicable terms, each acknowledging the other's special sphere and education.

But then this happy state of things does not meet the case of the majority of our brethren who live far off in distant country towns; nor indeed does it meet the case of many of our friends at the East-end of London and in suburban districts; so that if the calling into power of this obsolete Apothecaries Act is to be allowed to take away the actual existence of some, who although they prescribe for simple ailments, do so simply to meet the public want, and the public demand in these days of free trade, and because in most instances the case is too simple to call in the attendance of a doctor—then it does seem a little hard.

I myself have frequently known the medical attendant when applied to to say, "You might go to your chemist and get a little gargle or cough mixture, as the case may be, and come to me when you are ill." As a rule, the busy practitioner has too much to occupy his attention to leave any room for him to desire to take away from a few who are honoured with the distinctive title of prescribing chemists, their simple recommendations, for which they get about one and sixpence or two shillings, and there, as a rule, the case ends.

I am not myself a prescribing chemist, my lot being cast in a neighbourhood where, generally speaking, medical men are rather more liberal than to want the whole thing, prescribing and dispensing also; and we find the doctrine of division of labour to answer well here; but then I know that in many country towns, medical men not only visit and prescribe but dispense their own medicines also, and not by any means unfrequently do they employ a chemists' assistant to attend all the minor cases for one half the remuneration which it would be necessary to pay a qualified man.

If medical men in the country complain so much of the little encroachment of chemists on their preserves, surely there is much greater cause for pharmacists, who are now thoroughly well up in their business, to make a much louder cry on the subject of doctors doing the whole thing, which includes sending out their own physic into the bargain.

In conclusion, I have only one word to add, and it is this: not unfrequently, when I have conversed with members of the medical profession on this subject, they have given as a reason for dispensing their own medicines, that chemists in many places are not to be depended upon; and they are more sure of their patients getting the right articles.

Now, sir, I do not agree with this explanation, which strikes at the root of the Pharmaceutical Society; because I am convinced that the whole body of chemists and druggists are an exceedingly intelligent class of men, and as a rule, not only do they do their work well, but would certainly carry out all matters pertaining to pharmacy as their special calling, much better than medical men can do themselves.

A. W. Postans.

35, *Baker Street, W.*

Sir,—The resolution of the Council of the Society to defend counter practice of chemists is a step in the right direction. I regret the question had ever been raised, because it is not advisable to permit chemists to treat disease officially as it were, or as a right; it is also impossible for a chemist to carry on his business, viz., the compounding and sale of remedies as a mute; moreover he is morally bound to protect the ignorant customer against injury resulting from the misuse of medicine, and he can often only do so by putting the patient in the right course.

Theology and medicine have by the general progress of mankind ceased to be the special domain of one or two sets of individual priests, or medicine men. They are matters which affect mankind so closely and intimately that occult practice in either branch is viewed with suspicion, and individual common sense is sharpened. One of the outcomes of this general enlightenment is the position the chemist has assigned to him by the public; they bring their little guesses to him in many minor ailments for his sanction or emendation on the one hand, and for his opinion on the choice of a physician or a medical man on the other. The chemist is by his education and employment a professor of remedies; he has little or no pathology to guide him in the use of them, but contact with well trained medical minds with an earnest desire and habit to comprehend the wishes and directions of those minds, with a very little intuition, puts the chemist above the general intelligence of the public in that department; moreover he is very accessible. This open door invites the man with a pain, it is often not a question of doctor or chemist, but of a draught, or brandy. If he goes to the public house the publican although interested in the sale, may decide for him whether it shall be brandy, gin and bitters, aniseed or shrub. Is the chemist who has to decide between soda and ammonia, gentian and potash, castor oil or rhubarb, to be mute because he is interested in the sale of the remedies? Or, notwithstanding his greater power of discrimination, to stop where the publican stops—Well, gentian and potash wont do you any harm. He takes it kindly from the landlord of the inn, would he not rather say to the chemist—That is not the question; will it do me any good? On this hangs the whole matter; everything else in counter practice is subsidiary to this. Yield this point, all else must follow, and the safeguard to the public interest is the petitioner for gratuitous advice well knows his informant does not possess a medical diploma, and the responsibility of the act rests with the customer not with the chemist; he has done like a king of old time—he has made his priests other than of the house of Levi.

A compromise between the two great branches of the faculty of medicine is the solution of the matter. Chemists must not visit patients nor pretend to be other than they are. And medical men must not keep a dozen kinds of whitened pills for every case, nor concentrated mixtures for every ill, for both are mendacious quackery.

To appeal to statute law, reminds one of a holiday reverie on coming to a sign post with three arms—one dilapidated and erased, pointing to a road overgrown with brambles, thistles and wild flowers, the only intelligible letters are To Apot.......... Farmer: Yokel, where does this lead to? Answer. To apothecaries farm, sir, not been used for many years, as you see, sir. This here road, good many serpents in the long grass. You can get along by the foot path by the hedge side and then cross a meadow by a deep rut—there's no regular foot path; the field belongs to the college of physicians, but they wont interfere with you if the dog keeps out of the preserves.

George Mee.

79, *Grosvenor Road, Highbury.*

Mushrooms as Food.

Sir,—In Mr. Husemann's paper on this subject, published in your Journal of August 4th, p. 85, there is surely a very important omission. The proportion of water in mushrooms is very large, but it is nowhere stated. The organic principles in 100 parts of dry substance, and the mineral constituents of the ash are given, but the quantity of water and ash per cent. contained in the recent edible mushroom is omitted. The practical question in using the *Boletus edulis* as found is, how much of the recent mushroom is represented by 100 parts of dry substance, containing 22·82 of protein, etc.?

August 13, 1877. Alfred S. Taylor.

G. W.—(1) The so-called "musk seeds" (*Abelmoschus moschata* (Malvaceæ). (2) No.

"*Flos.*"—(1) *Mentha piperita*; (2) *Mentha aquatica* (3) *Erica cinerea*; (4) *Angelica sylvestris*; (5) *Epilobium parviflorum*; (6) *Lotus major*; (7) *Pulicaria dysenterica*; (8) *Alisma plantago*.

Pheœnix has not complied with the rule as to anonymous communications.

"*Hibernia*" is recommended to communicate with the Secretary of the Association referred to.

J. W. Breton.—The annual subscription for the *Journal de Pharmacie* in countries included within the postal union is 17 francs. Address the publisher, G. Masson, Rue Hautefeuille, Paris.

"*Spes.*"—(1) Cole's 'Manual of Dental Mechanics,' published by J. and A. Churchill. (2) Victoria is the only Australian colony in which there is yet a Pharmacy Act; this was summarized in the *Pharmaceutical Journal* for April 21 last. (3) We are unable to say.

S. G. and S.—(1) Apply to the Registrar of Trade Marks, Quality Court, Chancery Lane. (2) The Solicitor to the Board of Inland Revenue.

T. P. B.—The Dalmatian insect powder is said to be obtained from *Pyrethrum cinerariæfolium*, Trev. See *Pharm. Journ.* [3], vol. v., p. 503.

J. S. Whyte.—*Goodyera repens* and *Trientalis Europœa*.

"*Natura.*"—*Potentilla anserina*; (2) Send a specimen in fruit; (3) *Polygonum aviculare*; (4) *Holcus lanatus*; (5) *Poa trivialis*; (6) *Dactylis glomerata*; (7) *Senecio Jacobœa*.

J. T. Fox.—(1) *Calluna vulgaris*; (2) *Malva moschata*; (3) *Scutellaria minor*; (4) *Stellaria graminea*.

"*An Associate.*"—We cannot undertake the recommendation of particular firms.

"*M. B.*"—It is according to the usual method of writing Roman numerals.

J. Whitelaw.—It is applied in aqueous solution; the strength of which and frequency of application would depend upon circumstances.

J. Y. Fox.—(a) *Narthecium ossifragum*; (b) *Serratula tinctoria*; (c) *Geranium dissectum*; (d) *Chenopodium album*.

Errata.—In the letter on Counter Practice on p. 140, col. i., line 5 from bottom, *for* "discuss" *read* "dismiss," and in the last line but one of the letter, *for* "sketch" *read* "stretch."

Communications, Letters, etc., have been received from Mr. Abraham, Dr. Davy, Mr. Watt, Mr. Harris, Subscriber, J.

NOTES ON INDIAN DRUGS.

BY W. DYMOCK.

(*Continued from page* 105.)

STERCULIA URENS.—*Local names*, KARAI, PANDROOK, KAVALEE.

This tree is abundant in Khandesh, where the gum is collected for sale, and enters commerce as Karai gond. A few trees probably planted in Bombay. They abound in the Concans. The gum exudes most abundantly in the hot weather; it varies a good deal in appearance, some pieces being in thin laminæ, like tragacanth, while others are lumpy or vermiform. Placed in water it forms a firm, colourless, tasteless jelly, but on the addition of a large quantity it dissolves; the solution is precipitated by acetate of lead. Karai gond is used as a substitute for tragacanth, and is issued from the government stores.

PINILIA TUBERIFERA—ZARAWAND I GIRD.

The small roundish bodies which are sold in the shops under this name have been found by Dr. Sakharam Arjun to be the tubers of an Arum and not the root of *Aristolochia rotunda*, as is generally stated. They are light brown externally and vary much in size, the smallest being no larger than a pea, the largest as big as a marble; at the apex is a depression filled by the scales of the bud, at the base another marking the attachment of the roots. The interior is white and farinaceous, the taste insipid. As a medicine they are probably inert.

HYOSCYAMUS NIGER.—*Local name of seed*, KHORASANEE AJWAN.

The seeds are sold under this name in the bazaar. I find on comparison that they are exactly similar to the seeds produced by plants raised from English seed. They are imported from Persia. Henbane is cultivated for medicinal purposes in the government gardens at Hewra near Poonah.

DELPHINIUM, Sp.?—*Local names*, TRAYAMANA *and* ASFRAK.

The drug consists of the flowers, flower-stalks, and a small proportion of the immature fruit, all of a light greenish-yellow colour, and having a somewhat honey-like smell. The flowers are many of them tolerably perfect, and in size and shape are not unlike those of the common single larkspur. The fruit consists of three folicles which are arranged like those of the aconite, and dehisce on the inside; they are marked with very prominent longitudinal ribs, have pointed apices, and are placed upon a stout curved peduncle. The seeds are numerous, angular, as in aconite, and studded with white feather-like hairs all pointing towards the thick end. Trayamana when placed in water immediately tinges it of a bright yellow. It has a bitter taste not unlike gentian; it is described in the 'Makhzan ul Adwiga' under its Arabic name zarir. "The author says that it grows in the Gorjan or Khorjan Hills, and is called arjeekun in Greek. It has a stem about a span high and yellow flowers. It is detergent, anodyne, and diuretic; useful in spleen, jaundice, and dropsy, also as poultice mixed with barley meal in inflammatory swellings. Dose five drachms." In Bombay it is chiefly used as a yellow dye for silk, and is worth about one shilling a pound. It is also an ingredient in some of the diet drinks which the native druggists prescribe for their customers. I can find no notice of it in any English work on Indian drugs or dyes.

POA CYNOSURIOIDES.—*Local name in Goa*, GRAMINA.

This grass has a creeping root which forms at intervals a number of small, very hard knots or bulbs, from each of which rises a stem, and from the under surface of which numerous strong rootlets are given off. The culm is stout and round, clothed at the base with withered sheaths. In the drug it is cut off a few inches from the root. This article has a bitter taste. It is the gramina of the Portuguese at Goa, and is used as a diuretic. I have not seen it used medicinally in Bombay; but under the names of kash, darbh, or dad, it is in constant requisition at the funeral ceremonies of the Hindoos. The chief mourner wears a ring of the grass upon his finger; it is also placed beneath the pinda's. Darbh must not be confounded with doorba (*Cynodon dactylon*) another grass which is sacred to Gunnesh.

APLOTAXIS COSTUS.—*Bombay name*, OUPLATE; *the* KOOT *or* PUTCHAK *of other parts of India*.

The credit of first suggesting the source of this drug is due to Guibourt; his conjectures were afterwards confirmed by Falconer, who, when on a visit to Cashmere, discovered that an aplotaxis growing there produced the commercial costus. The plant itself had been previously described by Jacquemont in 1831; Falconer's description may be found in the *Transactions of the Linnean Society*, 1845, vol. xix., p. 23. There is also a full account of the drug and plant, with woodcuts, in Guibourt's 'History of Drugs,' vol. iii., p. 32, *et seq*. Large quantities of ouplate are imported into Bombay from Cashmere by way of Amritsir. It is extensively used as a perfume, and to protect clothes from moths; also as an aphrodisiac and vermifuge. It occurs in crooked twisted pieces about 3 inches long, and from $\frac{1}{2}$ to $1\frac{1}{2}$ inches in diameter, almost always split. The central portion is generally absent and appears to have been removed by decay before the root was collected. Externally it is brown and marked by longitudinal ridges, internally dirty white and resinous; taste bitter, odour something like orris root. A microscopic examination shows that the root consists of two parts, viz: a thick cortical layer of close texture, pervaded by a few laticiferous vessels, and an inner radiating portion, the parenchyma of which is not so dense. This portion is also provided with laticiferous ducts, and a very abundant scalariform vascular system which appears loaded with resinous matter. No trace of starch is to be seen, nor does the iodine test indicate its presence. The central portion of the root is absent as already noticed.

TEPHROSIA PURPUREA.—*Local name*, SARPANKHA.

This is a common weed in the rains. The whole plant, which is about two feet in height, is pulled up when the flowers begin to appear, and tied in bundles for sale. It is described in the Bombay Flora as "a shrubby, erect, much branched weed, leaves pinnated, leaflets cuneate-oblong, leaf opposed; racemes peduncled, longer than the leaves; legumes slightly compressed, spreading, linear, falcate, obtuse, with a short point. To this may be added that there are from five to eight or nine pairs of leaflets, and generally a single terminal one, the largest an inch long and three-tenths of an inch broad. The plant is a little bitter and is given in dyspepsia and bowel complaints arising from it. Sarpankha is generally to be obtained in the shops.

LODICEA SEYCHELLARUM.—*Local name* DARYAI, NARIL.

The kernel of the sea cocoa nut is in great repute among the Arabs and Indians as a strengthening medicine; it is from three-quarters to one inch thick and very hard, having much the appearance of vegetable ivory; it has no odour or taste; when soaked in water it softens a little and can be split into thin fibrous bundles. Examined under the microscope these are seen to be composed of spindle-shaped cells having a central cavity, from which club-shaped canals extend to the cell wall, where they are opposed to similar canals belonging to a neighbouring cell. The palm which produces this nut grows in the Seychelles, and the nuts are exported to India and Arabia. From the leaves very beautiful work-baskets, hats, bonnets, and many other fancy articles are made. A description of the nut is unnecessary, as it is to be seen in most museums and cannot be mistaken for any other object.

(*To be continued.*)

COMPARATIVE CHEMICAL EXAMINATION OF THAPSIA GARGANICA AND THAPSIA SILPHIUM.*

BY M. YVON.

A short time since, in an exhaustive paper, an abstract of which was published in this Journal,† M. Herincq claimed to have demonstrated that an Algerian plant to which the name *Thapsia Silphium* had been given, and which was alleged to be the source of the silphion of the ancients, was identical with the *Thapsia Garganica* of Europe. Admitting this as proved, M. Yvon thought it would be interesting to examine whether the growth of the same plant in different latitudes affected its ultimate composition.

Exposed to prolonged heat in a stove, the root bark of *Thapsia Garganica* lost 12·93 per cent. of water, that of *Thapsia Silphium* lost 17·35 per cent. The dried substance gave the following results upon analysis:—

	T. Garganica.		T. Silphium.	
Organic Matter	91·24		90·26	
Starch		22·510		26·124
Gum		5·179		5·421
Gum-resin		5·759		4·271
Resin		2·554		3·192
Albumin		1·354		0·624
Inorganic	8·76			
Lime		1·365		1·368
Magnesia		0·677		0·697
Iron		0·370		0·224
Albumin		0·338		0·508
Sulphuric Acid		0·297		0·300
Phosphoric Acid		1·468		1·919
Chlorine		0·219		0·420
Silica		2·715		0·707
	100·00	100·000	100·00	100·000

An examination of this table shows that there is a considerable concordance between the mineral constituents of the plants dried at 100° C., and almost as great in the organic constituents, the quantity of resinous matters being nearly the same. Inquiries directed to ascertain what influence the nature of the soil might have brought out the fact that in Algeria the plant grows equally well in all soils. In consequence of the presence of resinous matters the author does not speak decisively as to the existence of an alkaloid in the plant.

Examined under the microscope the starch of the two kinds appears to be similar except as to size, that of the *T. Silphium* varying in diameter from $0^{m}\cdot004$ to $0^{m}\cdot015$, and that of *T. Garganica* from $0^{m}\cdot006$ to $0^{m}\cdot026$.

Although the amount of resin obtained from the two plants was so nearly the same it differed considerably in activity. During the extraction of the resin from the root bark of the *T. Silphium*, which was done by exhausting it with 99° alcohol after previous treatment with 60° alcohol, there was given off a peculiar not unpleasant aromatic odour that was not observed with the *T. Garganica*. The activity of the silphium resin, however, was found to be excessive. In spite of all precautions a stay in the laboratory during the evaporation of the alcohol produces a rather painful sensation of heat which afterwards became localized in the nostrils, eyelids, and especially in the neck behind the lobes of the ears. After twelve hours of intolerable itching at these points a very intense miliary eruption took place, together with swelling of the eyelids and finally desquamation. The work was therefore dropped for two months, but the same symptoms followed a renewal of it. Even contact of the fingers with resin produced the symptoms notwithstanding immediate washing with alcohol and soda. A curious point is that no inconvenience was experienced in the hands and arms. Nothing of the kind occurred during the manipulation of the garganica resin.

* Abstract of a paper read before the Union Scientifique des Pharmaciens de France, and published in the *Journal de Pharmacie* [4], vol. xxv., p. 588.

† See before, vol., vii., p. 750.

THE DISPENSING OF MONOBROMATED CAMPHOR.*

BY M. PATROUILLARD LEPAGE.

Having had occasion to prepare medicines into the composition of which monobromated camphor entered together with syrups or water, the author, after several experiments, took advantage of the property this substance has of dissolving in fixed oils, especially oil of sweet almonds, which will take up about one-sixth of its weight of monobromated camphor. In this way he obtained homogeneous preparations of monobromated camphor, miscible in aqueous vehicles, easy to administer and acting promptly, it being introduced into the body in a liquid state. The plan adopted was to dissolve the monobromated camphor in six times its weight of almond oil by the aid of a gentle heat, emulsify the oily solution with gum arabic, and then suspend it in syrup or in water according to the indications of the prescription. The emulsions obtained were as perfect as those with almond oil alone.

In consequence of the instability of the oil used as a solvent, the emulsion should be prepared as required; the monobromated camphor, however, appears to keep without undergoing any decomposition, even after an interval of three months.

To emulsify seven grams of the oily solution, containing one gram of the active substance, the author employs three grams of powdered gum arabic suspended in double its weight of water. When the emulsion has been made, the necessary quantity of syrup or water is added in the usual manner.

The author has made some experiments on the dispensing of salicylic acid in a similar way, but these were unsatisfactory in consequence of the slight solubility of this substance in the oil.

* From a paper in the *Journal de Pharmacie* [4], vol. xxv., p. 533.

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 1, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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COUNTER PRACTICE.

IN the last number of the *Lancet* additional prominence is given to the discussion of this subject by the comments of the Editor upon the proceedings in reference to counter practice at the last meeting of the Council of the Pharmaceutical Society, and the views put forward are throughout characterized by considerable exaggeration. In the first place, it is assumed that by the terms of the resolution passed by the Council the Society has been distinctly pledged to defend medical practice by chemists, and it is also stated that this was done notwithstanding the acknowledgment by most of the speakers who voted for the resolution in question that counter practice is illegal.

We take decided exception to both the assumption and the statement as being wholly at variance with the facts of the case. In the first place the terms of the resolution passed at the last meeting of the Council do not in any degree justify the interpretation put upon it. Even as originally put it was only to the effect that the Council should defend, if necessary, a member of the Society who had been threatened with prosecution under the Apothecaries' Act. In the amended form, in which the resolution was eventually passed, it merely gave authority to the Society's Solicitor to defend the case at his discretion. In the course of the discussion it was stated that there was reason for considering that in the case referred to the chemist had been conducting his business properly, and according to the practice of a majority of the trade, and the provision that the defence of the case should be subject to the discretion of the Society's Solicitor clearly shows that there was no intention to set the law at defiance. It must also be remembered that the resolution had reference to the defence of a case of prosecution under the Apothecaries' Act, the propriety of which is rendered at least doubtful by the comments of Baron BRAMWELL in his summing up of the case tried by him last year. Although this judge pointed out that the Act was so strict in its terms that if a man entered a chemist's shop and asked for something to cure a headache, and the chemist gave him a draught, he would technically infringe the terms of the Act, still he added his opinion that it would be very unreasonable if the Apothecaries' Company were to interfere in such a case. As regards the particular merits of the case tried by Baron BRAMWELL, it is unnecessary to offer any opinion since that is a matter entirely apart from the question now under consideration. It is against the unreasonable application of the Apothecaries' Act that chemists are now protesting, and that the Council of the Pharmaceutical Society has decided to take action.

It is therefore only by an unwarrantable straining of the terms of the Council's resolution that it can be represented as indicating a determination to defend medical practice by chemists. The Society as a body has always sought to develope the opinion that the business of the pharmacist should not comprise the prescribing of medicine; but under existing conditions the general acceptance of this view of the case can only be regarded as a desideratum which may be realized at some future time. It is futile to suppose that the Pharmaceutical Society can put a stop to the practice which has long prevailed amongst chemists, though many of it members abstain from it themselves and would gladly see their example followed.

However the action of the Medical Defence Association in prosecuting chemists under the Apothecaries' Act has contributed very much to awaken a spirit of resistance, and it has led to the assertion of a right on the part of chemists to continue doing what they have long been accustomed to in furnishing remedies for minor ailments. It has always been our practice to deprecate discussion even of the propriety of this proceeding and it is with much regret that we now find the opposition to it conducted in such a manner as to raise the question whether or not chemists have a less right to prescribe medicines than every other individual in the country has.

As regards the statement made by the *Lancet*, that most of the speakers who voted for the resolution acknowledged the illegality of counter practice, we can only give it the most unqualified contradiction, and that we are justified in doing so the report of the discussion will clearly show. The *Lancet* is indeed totally in error on this point, and beyond the remarks of the President and MR. HILLS, there is no ground for the satisfaction it expresses at observing that the large majority of speakers at the Council meeting had a conviction that prescribing over the counter is illegitimate. On the contrary, the majority of the members of the Council and the majority of the trade are decidedly of opinion that counter practice is legitimate, and although many of those who hold this view are also disposed to think that it would be to the advantage of themselves as well as medical men if prescribing and dispensing could be dissociated, we cannot shut our eyes to the fact that if the Apothecaries' Act be oppressively applied to chemists the general feeling will be one of resolute determination to try the question of right.

Here another aspect of this matter requires to be noticed, viz., the convenience of the public; and we apprehend that in the event of a contest between the medical profession and chemists, the decision arrived at would probably be influenced much more by consideration of this point than by any abstract regard for the rights of either contending party. Although we do not endorse all the views of correspondents who have written on the subject of counter practice in this Journal, it cannot be denied that in very many instances the possibility of obtaining simple remedies at a very moderate cost from the chemist is a great boon to a large class of the community who would otherwise be unable to obtain relief. At the same time it may reasonably be assumed that the improved educational advantages which the chemist now enjoys through the efforts of the Pharmaceutical Society will not be inoperative in preventing him from exceeding reasonable limits in the matter of counter practice.

A MYSTERIOUS PLANT.

Although nearly four centuries have elapsed since the island of Hayti was first trodden by European feet, it is at the present time, from political causes, almost a *terra incognita*. But Major Stuart, Her Majesty's Consul-General in that island has just sent home an interesting account of the country, which creates a desire that it should be scientifically explored and especially that its rich tropical flora should be investigated by a competent botanist. Major Stuart makes special reference to one plant —whether a tree, shrub or a herb he does not say— which he has no doubt would prove, as an anæsthetic, a valuable acquisition to medical science. The knowledge of this plant, he says, is confined to a few families, who transmit the secret from generation to generation as a heirloom. The heritage is highly prized as conferring a power of miracle working, and this power, known as "wanga," is used not only to bolster up superstition but to facilitate crime. It is asserted that a skilful "wanga" priest has such a knowledge of the effects of this plant that he can produce with it coma of any intensity or duration and by his knowledge of the moment of returning consciousness can make a show of recalling the patient to life. Major Stuart goes on to say that if a burglary is to be committed the "wanga" man "can "by means of his art cast a deep sleep on all in-"doors, and one may understand how he can attain "other forbidden ends in the same way." Perhaps so, but we confess we do not understand the way.

PROPRIETARY MEDICINES IN JAPAN.

It appears that medical compounds of the nature of those to which in this country the term "quack medicines" is often applied, share the confidence of the Japanese public with charms against every description of disease and misfortune, which are sold at all the temples. The Mikado's Minister of Finance, in his zeal for the welfare of the community—quickened probably by having to provide for one of the luxuries of western civilization, a national debt—has sought to limit this unorthodox medical treatment of the people by the imposition in January last, of a tax on druggists' licences. This tax does not affect the drugs and medicines used and prescribed by the medical profession, but is directed solely against the "quack" compounds referred to. To obtain permission to make or sell these medicines a minute description in writing of the nature and effect of each has to be sent to the Ministry of the Interior, and heavy penalties are attached to their unauthorized sale and manufacture. A licence for the manufacture of such medicines costs eight shillings per medicine, and a druggist pays one shilling per medicine for a licence to sell.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

(*Continued from page* 133.)

After the conclusion of the President's address the reading of papers commenced. The first paper was a—

Report of the Committee appointed in 1876, for the purpose of continuing Investigations on the Aconite Alkaloids (consisting of Mr. T. B. Groves, Mr. J. Williams, and Dr. C. R. Alder Wright): being the "Third Report on the Chemistry of the Aconite Alkaloids."

DRAWN UP BY

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Since the presentation of the Second Report last year, a large number of experiments have been made in the hope of obtaining information as to the chemical "Structure" of aconitine (the chief crystallizable active alkaloid of *Aconitum Napellus*), and of pseudaconitine (the main crystallizable active base of *A. ferox*). Although the experiments are not yet completed, yet several points of considerable pharmaceutical and chemical interest have been arrived at, and a number of discrepancies in the results obtained by former observers have been reconciled and cleared up; whilst an explanation has been gained of several perplexing circumstances connected with the preparation of alkaloids from the roots of various species of aconites, and in particular of the great differences in physiological potency sometimes exhibited by different specimens of alkaloids derived from these plants. Some valuable information as to the deficiencies and imperfections of the manufacturing processes for the isolation of these alkaloids has also been gained; and a method of assaying elaborated whereby a sufficiently close approximation to the percentage of active alkaloid contained in the manufactured bases can be readily attained.

The experiments made may be most conveniently described in five sections, referring respectively to the decomposition products of aconitine, those of pseudaconitine, the further investigation of the alkaloidal constituents of different species of the aconite family, processes for assaying commercial aconite alkaloids, and the conclusions to be drawn from the work hitherto done on the subject.

§1. *Decomposition Products of Aconitine. Action of Water on Aconitine.*

When aconitine is heated to 140—150 in a sealed tube with water for from 10 to 24 hours it completely dissolves, forming a slightly yellowish liquid of *acid* reaction; this latter circumstance clearly indicates either that one equivalent of acid is produced by the decomposition for one of nitrogenous decomposition-product, or else that the latter substance is deficient in acid-saturating power; the latter appears to be the case from the following results:—

One gram of pure aconitine thus treated yielded an acid liquid to which a known quantity of standard soda solution was added until strongly alkaline; the fluid was then agitated with ether, to remove, as far as possible, bases, and the excess of alkali was then titrated with standard acid. In this way it was found that the acid produced permanently neutralized 14·1 c.c. of decinormal soda solution, equivalent to 0·909 gram of aconitine, or somewhat less than one equivalent of acid for one of aconitine employed, the deficiency being due, as will be subsequently shown, to the imperfect removal from the alkaline fluid of the complementary nitrogenous product.

The reaction is indicated by the equation

$$C_{33}H_{43}NO_{12} + H_2O = C_7H_6O_2 + C_{26}H_{39}NO_{11}$$

the acid produced being *benzoic acid.* To the complementary product $C_{26}H_{39}NO_{11}$, it is proposed to assign the term "*aconine,*" to represent its connection with aconitine, which, in fact, as shown below, is apparently *benzoyl-aconine* $C_{26}H_{38}(C_7H_5O)NO_{11}$. The benzoic acid thus produced was quantitatively determined by adding hydrochloric acid to the product of the action in sealed tubes, agitating with ether, and allowing the ethereal solution to evaporate spontaneously, the residue being finally dried for a night over sulphuric acid; when weighed quantities of benzoic acid were thus treated as a check on the method, almost exactly the amount employed was regained. In hot weather, by exposure to air for some days, however, a considerable volatilization of benzoic acid takes place. In this way—

2·910 grams of aconitine yielded 0·441 of benzoic acid
3·000 " " " 0·479 " "

	Calculated from above equation.	Found.	
Benzoic acid per 100 aconitine used,	18·9	15·2	16·0

The numbers found, are sufficiently near to show (when taken in connection with the subsequent data), that the above equation represents the main change taking place.

After recrystallization from boiling water, the acid melted at 120°·5 and possessed all the physical characters of ordinary benzoic acid, yielding also its qualitative reactions; on combustion

0·2090 gram gave 0·5215 CO_2 and 0·0935 H_2O.

	Calculated.		Found.
C_7	84	68·85	68·05
H_6	6	4·92	4·97
O_2	32	26·23	
$C_7H_6O_2$	122	100·00	

The isolation of the complementary product was a matter of far greater difficulty, on account of its peculiar properties. As above stated it is only imperfectly removed from an aqueous alkaline solution by agitation with ether; the ethereal extract dried up to a wholly non-crystalline varnish, but this did not seem to be the body in a state of purity, being contaminated with traces of unaltered or differently changed aconitine, bye-products, etc., and in particular giving a slight precipitate on solution in a drop of hydrochloric acid and addition of sodium carbonate, which does not occur with pure aconine salts. Attempts were first made to obtain aconine as hydrochloride by adding hydrochloric acid to the product of the action in sealed tubes, removing benzoic acid by agitation with ether, and then evaporating to dryness; but in this way a substance was obtained, which was not only impure from the admixture of the bye-products, etc., capable of solution in ether when the solution was rendered alkaline, but also contained some products formed by the action of the excess of hydrochloric acid on the aconine during the evaporation: the residue refused to crystallize and gave the following numbers.

0·2685 gram, gave 0·5470 CO_2 and 0·1995 H_2O
0·3870 " " 0·1080 AgCl

	Calculated for $C_{26}H_{39}NO_{11}$,HCl.	Found
Carbon	54·03	55·56
Hydrogen	6·93	8·25
Chlorine	6 15	6·91

Attempts to prepare the gold salt were not more successful, as the aurochloride when first precipitated forms yellow flakes, but during drying these clot together, forming a resinous substance which is apparently somewhat decomposed: this gold salt is somewhat soluble in water, and the solution leaves, on standing over sulphuric acid in the dark, a resinous substance containing particles of metallic gold, indicating reduction and decomposition.

0·9500 grains of resinous gold salt formed by the clotting together of the precipitate, gave 0·2250 Au = 23·68 per cent.

The formula $C_{26}H_{39}NO_{11}HCl,AuCl_3$ requires 22·27 per cent.

The following process, however, was found to yield aconine compounds in a state of tolerable purity. The liquid obtained by acting in sealed tubes with water on aconitine was rendered slightly acid by hydrochloric or sulphuric acid, and freed from benzoic acid by agitation with ether; it was rendered slightly alkaline by sodium carbonate, and again agitated with ether to remove bye-products, etc., soluble therein. The alkaline fluid was then evaporated to dryness, and treated with absolute alcohol, or better chloroform. The substance thus dissolved out was found to differ in character according to the amount of sodium carbonate added in the earlier stage of the process; if the carbonate was in quantity insufficient wholly to neutralize the sulphuric or hydrochloric acid originally used to acidify, a basic sulphate or hydrochloride was dissolved out; but if a large excess of sodium carbonate was used, the soluble body was simply aconine itself, contaminated with small quantities of sodium carbonate. The following numbers were obtained, due corrections being made for inorganic substances when small quantities of these were present.

Basic Sulphate of Aconine.

0·3250 gram gave 0·6615 CO_2 and 0·2295 H_2O
0·5405 " " 0·0300 $BaSO_4$

	Calculated for 7 $C_{26}H_{39}NO_{11}$,H_2SO_4	Found
Carbon	56·22	55·51
Total Hydrogen . .	7·08	7·84
H_2SO_4	2·52	2·35

Basic Hydrochloride of Aconine.

1·1255 gram gave 0·1790 AgCl
0·3277 " " 0·6595 CO_2, and 0·2320 H_2O

	Calculated for 3$C_{26}H_{39}NO_{11}$, 2HCl.	Found
Carbon	55·19	54·88
Hydrogen	7·02	7·86
Chlorine	4·18	3·94
Nitrogen & oxygen (by difference)	33·61	33·32
	100·00	100·00

Free Aconine. It was found difficult to obtain aconine perfectly free from all traces of inorganic matters. On treatment with absolute alcohol of the purified aconine salts evaporated to dryness with excess of carbonate of soda, small quantities of sodium carbonate and chloride, etc., are dissolved out; whilst they are not wholly separated by again evaporating to dryness and taking up with chloroform.

0·2335 of substance, purified by absolute alcohol gave 0·500 CO_2, and 0·1830 H_2O.

Another sample further purified by chloroform: 0·2725 gram gave 0·5740 CO_2, and 0·1990 H_2O.

	Calculated		Found	
C_{26}	312	57·67	58·39	57·45
H_{39}	39	7·21	8·71	8·12
N	14	2·59		
O_{11}	176	32·53		
$C_{26}H_{39}NO_{11}$	541	100·00		

Aconine is very readily soluble in alcohol and chloroform, but is almost insoluble in ether; the solutions are bitter and produce no tingling of the skin or lips. Aqueous solutions precipitate, when moderately concentrated, tannin, gold chloride and lead acetate. In all these respects aconine exactly agrees with the "Acolyctine" of Hübschmann (*Jahresbericht*, 1866, 483) and of Von Schroff (*N. Repert. Pharm.*, xx., 641) obtained by the former from the roots of the yellow-flowered aconite by a process with involved heating the alcoholic tincture of the root with lime, and also with sulphuric acid, and finally evaporating to dryness with sodium carbonate, separation of matters soluble in ether, and purification by solution in chloroform. As shown below, these processes must inevitably have decomposed aconitine, if originally present, with formation of aconine; hence there seems to be good reason for supposing that the "acolyctine" of Hübschmann (and consequently the "napelline" of the same chemist, discovered by him in commercial so called "aconitine" (*Jahresbericht*, 1857, 416), and subsequently stated by him to be identical with "acolyctine") is not a natural alkaloid characteristic of a particular species of aconite, but is simply a decomposition product of aconitine formed by the violent treatment to which the roots were subjected; and this is rendered the more probable in that the second base (so-called "lycoctonine") found simultaneously by Hübschmann, is apparently the analogously formed decomposition product of pseudaconitine (*vide* § 2); whilst, on the other hand, both aconitine and pseudaconitine appear to occur both in *A. Napellus* and *A. ferox* roots, the former predominating in the first and the latter in the second species (*vide* § 3).

On adding potassium mercuriodide to a solution of an aconine salt (rendered slightly acid by hydrochloric acid), a floculent white precipitate is thrown down, much resembling the analogously formed precipitates with aconitine and pseudaconitine, but sensibly more soluble in excess of the reagent, and on dilution of the turbid fluid with water. After drying over sulphuric acid, and finally at 100° this compound gave the following numbers:—

0·4155 gram gave 0·2570 Ag I. Iodine 33·43 per cent.
Calculated for

$C_{26}H_{39}NO_{11},HI,HgI_2$ „ 33·93 „

It deserves notice that benzoic acid has been previously obtained by the decomposition of two other alkaloids, viz., atropine (Kraut, *Jahresbericht*, 1865, 448), and cocaine (Lossen, *ibid.*, 451).

The decomposition of aconitine in accordance with the equation

$$C_{33}H_{43}NO_{12}+H_2O=C_7H_6O_2+C_{26}H_{39}NO_{11}$$

seems to indicate that aconitine is *benzoyl-aconine* $C_{26}H_{38}(C_7H_5O)NO_{11}$, analogous to the benzoylated acetylated and butyrylated morphine and codeine prepared by one of us in conjunction with Mr. G. Beckett (*Chem. Soc. Journal*, 1874, 1031, and 1875, 15 and 312). It might be hence supposed that by acting on aconine with benzoic anhydride aconitine might be reproduced in accordance with the equation

$$C_{26}H_{39}NO_{11}+(C_7H_5O)_2O=$$
$$C_{26}H_{38}(C_7H_5O)NO_{11}+C_7H_6O_2.$$

On trying the experiment this seems to be the case; but the action does not stop here, *two* benzoyl groups being appparently introduced so as to give rise to a *benzoyl-aconitine*, or *dibenzoyl-aconine* $C_{26}H_{37}(C_7H_5O)_2NO_{11}$. This substance forms a hydrochloride much less soluble than that of aconitine; its gold salt is a stable body not decomposed at 100°, and the solutions of the salts of the base are precipitated by carbonate of soda. As yet we have not prepared it in sufficient quantity to obtain it perfectly pure, wherefore we leave its description until our experiments are further advanced. It is particularly noteworthy that a substance of exactly the same properties and composition is obtained by the action of benzoic anhydride on aconitine itself by virtue of the reaction.

$$C_{36}H_{38}(C_7H_5O)NO_{11}+(C_7H_5O)_2O=$$
$$C_{36}H_{37}(C_7H_5O)_3NO_{11}+C_7H_6O_2.$$

Hence in the formation of aconine from aconitine there does not seem to be any "molecular rearrangement."

Action of Alkalies on Aconitine.

As might be expected, the saponifying action of water on aconitine is greatly intensified if alkalies be present; thus, if excess of ammonia be added to a solution of an aconitine salt, and the whole be allowed to stand for some hours in the cold, a perceptible amount of action takes place, benzoic acid being obtainable from the solution by simply acidifying and shaking with ether. If the alkaline liquid be boiled, the action is brought about yet more quickly; complete solution speedily takes place, not from the greater solubility of aconitine in the heated fluid, for the reverse seems to be the case, but from the splitting up of the aconitine into the two products aconine and benzoic acid, each of which is readily soluble in ammonia. Fixed alkalies and sodium carbonate act in the same way. It may be noticed that this splitting up is the cause of the peculiar phenomenon observed by Mr. Groves ('Year-Book,' 1873, 508; *Pharm. J.* [3], iv., 295), viz., that an ammoniacal solution of aconitine after standing thirty hours yielded on acidification no precipitate whatever with potassium mercuriodide; the aconine formed giving rise, as above stated, to a double iodide with mercury sensibly more soluble in water than the corresponding salts of aconitine and pseudaconitine. One practical conclusion to be drawn from this is that in the isolation of aconitine, prolonged contact of the free base with alkaline solutions must be avoided as far as possible; very probably the different yields of aconitine obtained by different observers are quite as much due to varying amounts of loss of aconitine through this decomposition as to differences as the amounts originally contained in the roots.

Action of Acids on Aconitine.

The action of acids on aconitine is not so marked as that of alkalies, being scarcely appreciable in the cold, though energetic enough in some cases at 100°. An acid solution of hydrobromide of aconitine was allowed to stand in a covered beaker for eight months; at the end of that time only minute quantities of benzoic acid could be extracted by ether. Again, aconitine was dissolved in a large excess of tartaric acid, and the solution kept boiling (an inverted condenser being attached) for twelve hours: at the end of this time only traces of benzoic acid could be extracted by ether.

Hot inorganic acids, however, act much more rapidly; thus an appreciable formation of benzoic acid is noticeable on boiling for some hours a slightly acid solution of aconitine in very dilute sulphuric acid; when 20 parts of 5 per cent. acid are employed (1 part aconitine, $1H_2SO_4$, and 20 of water) a considerable action ensues, about a third of the aconitine being converted into aconine and benzoic acid at the end of twelve hours. On adding sodium carbonate in excess to the acid liquid (previously freed from benzoic acid by agitation with ether) unchanged aconitine is precipitated and aconine remains in solution; by evaporating the solution to dryness and treating with chloroform or absolute alcohol this is dissolved out from the sodium sulphate and carbonate. The benzoic acid thus produced melted at 121° and gave all the reactions and possessed the physical characters of that acid. The carbonate of soda precipitate was carefully examined to see if it contained any other substance beside aconitine, but without success; on treatment with hydrobromic acid it furnished crystals of aconitine hydrobromide.

0·960 gram lost 0·061 at 100 = 6·35 per cent.
Calculated for $C_{33}H_{43}NO_{12},HBr, 2\frac{1}{2}H_2O = 5·83$.
0·612 gram of dried salt gave 0·1560 AgBr. Br=10·84 per cent.
Calculated Br=11·02 per cent.

The mother liquors of these crystals deposited more of the same crystals on evaporation, and the final mother liquors gave with a little ammonia a precipitate which furnished a gold salt of which

0·5070 gram gave 0·0835 Au = 20·51 per cent.
Calculated for aconitine aurochloride=19·92 per cent.

It may hence be inferred that the use of sulphuric acid for extracting aconitine from aconite roots as usually practised is likely to cause a considerable amount of loss of aconitine by splitting it up into benzoic acid and aconine; whilst the employment of tartaric acid, as suggested by Duquesnel, is comparatively free from this objection.

When hot concentrated mineral acids are in contact with aconitine, the saponifying action takes place very quickly: thus on heating aconitine to 100° in a sealed tube for three hours with about 15 parts of concentrated hydriodic acid solution, 8·3 per cent. of benzoic acid was obtained, or about half as much as was formed by the complete decomposition of the aconitine; the aconine produced is probably further altered by the hydriodic acid, but the nature of the product has not yet been examined. No methyl iodide was formed during the reaction, but that does not prove that aconitine does not contain a methyl group, as the same negative result was also obtained in a companion experiment at 100° with pseudaconitine which contains two methyl groups (*vide* § 2). Similar results were obtained on heating with concentrated hydrobromic acid to 100°, benzoic acid melting at 120—121 being formed in quantity.

§ 2. *Decomposition Products of Pseudaconitine.*

In the First Report ('Year Book' 1875, 514; *Pharm. Journ.* [3], vol. vi., p. 188), the formula $C_{36}H_{49}NO_{11}$ was assigned to pseudaconitine as the most probable one; the experiments since made confirm this formula, although it cannot be regarded as established with the same certainty as that of aconitine. $C_{33}H_{43}NO_{12}$, owing to the difficulty in forming any definite crystallized salt of pseudaconitine.

The amount of pseudaconitine at our disposal not being large, we took advantage of the circumstance that Messrs. Hopkin and Williams had recently worked up a considerable amount of alkaloid from *A. ferox* roots into a commercial preparation. As shown further on, this substance was very far from being pure pseudaconitine; but still it contained a considerable amount of that base, which was easily isolated by the purification process of M. Duquesnel, viz., dissolving in ether, adding light petroleum spirit, pouring off from a little watery and resinous matter thus thrown down, and finally allowing to crystallize by spontaneous evaporation. In this way something like one-third of the weight of material employed was obtained in a crystallized condition after collecting on the pump filter and slightly washing with ether and ether-petroleum mixture. A considerable amount of pseudaconitine was contained in the filtrate from these crystals, being prevented from crystallizing well by other matters also present; the filtrate dried up to a resinous mass in which a few crystals were interspersed; for the examination of this (*vide* § 3). The crude pseudaconitine crystals thus obtained were purified by a repetition of the process and then gave the following numbers

(1). 0·3225 gram gave 0·7465 CO_2 and 0·2135 H_2O.

In order still further to purify the crystals they were dissolved in hot alcohol and water added until the solution became milky; alcohol was then added till the whole was clear, and the liquid then set aside to cool in a covered beaker. Crystals exactly resembling the original ones then separated. These were separated by the pump filter next day and treated in the same way again.

(2). 0·2395 gram of the final crystals gave 0·5540 CO_2 and 0·1610 H_2O.

	Calculated		Found (1)	Found (2)
C_{36} . .	432	64·38	63·13	63·09
H_{49} . .	49	7·30	7·35	7·47
N . .	14	2·09		
O_{11} . .	176	26·23		
$C_{36}H_{49}NO_{11}$	671	100·00		

These numbers do not agree with the formula as sharply as might be desired; on the other hand, the gold salts prepared from these two specimens gave numbers agreeing well with the formula—

(1). 0·3840 gram of gold salt gave 0·0750 Au
0·3215 gram of gold salt gave 0·5025 CO_2 and 0·1545 H_2O.

(2). 0·7045 gram of gold salt gave 0·1385 Au
0·2930 gram of gold salt gave 0·4600 CO_2 and 0·1410 H_2O.

	Calculated for $C_{36}H_{49}NO_{11}$,HCl,$AuCl_3$	Found (1)	Found (2)
Carbon	42·77	42·61	42·82
Hydrogen . . .	4·95	5·34	5·35
Gold	19·40	19·53	19·66

It was subsequently found that these specimens (1) and (2) contained a small quantity of aconitine (*vide* § 3 and 4); but as the amount of this impurity was very small (less than 1 per cent.) it would not appreciably alter the numerical values.

Owing to the ease with which pseudaconitine breaks up in accordance with the equation—

$$C_{36}H_{49}NO_{11} + H_2O = C_9H_{10}O_4 + C_{27}H_{41}NO_3$$

parallel with that undergone by aconitine (§ 1), it is very doubtful whether any of the pseudaconitine yet obtained was perfectly pure, being probably more or less contaminated with the decomposition product $C_{27}H_{41}NO_8$; thus the alcoholic mother-liquor from which specimen No. 2 was obtained contained about two-thirds of the crystals No. 1 originally dissolved up in a form which did not admit of pseudaconitine crystallizing therefrom; they dried up on evaporation to a varnish, and the change was clearly traced, as shown below, to the occurrence of the above reaction to a great extent in presence simply of the hot aqueous alcohol.

Neither the acid $C_9H_{10}O_4$ nor the base $C_{27}H_{41}NO_8$ into which pseudaconitine thus splits is identical with the corresponding aconitine product: the former is found to be *dimethylprotocatechuic acid*, identical with that obtained by methylating protocatechuic acid, and by the oxidation of eugenol; the latter is very different from aconine, but as shown below is in all probability the main constituent of the mixture of bases obtained by Hübschmann from *A. Lycoctonum* and termed by him "lycoctonine:" to indicate this new base it is proposed to use the term *pseudaconine*, which calls to mind that pseudaconine bears to pseudaconitine the same relationship that aconine does to aconitine. It may be here noticed parenthetically, that the former researches of one of us have shown that *narcotine* when heated with water splits up in a parallel fashion forming hydrocotarnine and opianic acid, thus—

$$C_{22}H_{23}NO_7 + H_2O = C_{10}H_{10}O_5 + C_{12}H_{15}NO_3$$

(*Chem. Soc. Journal*, 1875, 573) and that the opianic acid thus produced is chemically closely allied to dimethylprotocatechuic acid, the two bodies being benzene derivatives represented by the formulæ:—

$$C_6H_2\left\{\begin{array}{l}CO.H\\CO.OH\\O.CH_3\\O.CH_3\end{array}\right. \quad \text{and} \quad C_6H_3\left\{\begin{array}{l}CO.OH\\O.CH_3\\O.CH_3\end{array}\right.$$

Hence, there is a certain amount of family connection between narcotine and pseudaconitine; whilst on the other hand, according to T. and H. Smith (*Jahresbericht*, 1864, 448) the juice of fresh aconite roots contains an alkaloid termed by them "aconellin," which appears to be identical with narcotine.

Action of Water on Pseudaconitine.

The dimethylprotocatechuic acid formed by the saponifying action of water, at 140—150°, on pseudaconitine is easily extracted by acidifying the product of the action with hydrochloric acid and shaking with a large bulk of ether. By spontaneous evaporation of the ethereal solution the following numbers were obtained:—

(*a*) 2·650 gram. of the pseudaconitine originally prepared by Mr. Groves and examined in the 1st Report (probably the purest specimen yet obtained, as it gave 63·84 per cent. of carbon on combustion, and its gold salt contained 19·46 per cent. and closely agreeing with the calculated values) gave 0·604 gram of acid.

(*b*) 3·000 gram of pseudaconitine from Messrs. Hopkin and Williams' preparation (crystals No. 1 above) gave 0·6645 gram. of acid.

	Calculated for above equation	Found (*a*)	Found (*b*)
Per cent. of acid	27·12	22·8	22·15

The deficiency is probably due partly to the formation of bye-products and partly to the pseudaconitine employed containing an admixture of pseudaconine and a trace of aconitine as above stated.

The acid thus obtained is less soluble in boiling water than benzoic acid, and very sparingly soluble in cold water; after recrystallization from boiling water, two different samples first completely melted at 176°—177° and 177°—178° (corrected) respectively. The following numbers were obtained on combustion:—

0·2325 gram gave 0·5030 CO_2 and 0·1175 H_2O

		Calculated.	Found.
C_9	108	59·34	59·01
H_{10}	10	5·49	5·62
O_4	64	35·17	
$C_9H_{10}O_4$	182	100·00	

That the acid was really dimethylprotocatechuic acid was shown further by the circumstance that on fusing at about 250° with caustic potash, acidification of the "melt" and treatment with ether, protocatechuic acid is formed readily recognized by its remarkable colour reactions. Moreover, the acid obtained, like synthetically prepared dimethylprotocatechuic acid, formed on exact neutralization with ammonia and addition of a drop of concentrated silver nitrate solution a most characteristic gelatinous silver salt. After crystallization from water the acid gave not the slightest trace of colour with ferric chloride; the crystals deposited from water were anhydrous after exposure to air for a few hours, as also were the crystals after draining on the pump filter, washing first with alcohol, and then with ether, and exposure to the air for a few minutes till the ether had evaporated. According to Kölle (*Annalen der Chemie* 159, 240) dimethylprotocatechuic acid crystallizes anhydrous. Beckett and Alder Wright, however, found (*Chem. Soc. Journ.*, 1876, 304) that the synthetically prepared acid was $C_9H_{10}O_4,H_2O$.

In order to obtain pseudaconine in a state of purity the acid liquid from which the dimethylprotocatechuic acid had been removed by ether was rendered alkaline by sodium carbonate and agitated with ether. Unless the solution was tolerably concentrated, no precipitate was formed on rendering it alkaline, and ether then dissolved out but little, pseudaconine being readily soluble in sodium carbonate and not being readily removed from the solution by ether; concentrated pseudaconine salts, however, precipitate with sodium carbonate, the precipitated base being readily taken up by ether. By evaporating down the alkaline liquid thus freed from traces of bye-product, etc., soluble in ether, pseudaconine was obtained as a resinous mass, separating out as the solution became concentrated; the last portions were readily obtained by evaporating to dryness and treating with ether; small quantities of aconine and colouring matters soluble in chloroform were thus left undissolved. Neither from the alcoholic nor the ethereal solutions could pseudaconine be obtained in the form of crystals, only transparent resinous varnishes being left; but on moistening these with water they become opaque, white, and brittle, readily breaking up into what to the naked eye appeared to be distinctly crystalline particles: under the microscope, some of these appeared indistinctly crystallized, but most were apparently coalesced globules. The formation of this apparently crystalline mass, from the transparent resin left on spontaneous evaporation of the solution of the base in ether (or ether and petroleum spirit) is extremely characteristic, not having been noticed with any of the other aconite alkaloids or their derivatives. It is especially noteworthy that this peculiar behaviour is, according to Flückiger (*Jahresbericht*, 1870, 837), precisely that of the so-called "lycoctonine" of Hübschmann (*loc. cit. supra*), obtained together with "acolyctine" from *A. Lycoctonum*. Inasmuch as the method adopted for the extraction of the alkaloids must inevitably have more or less converted pseudaconitine if originally present into pseudaconine, it is extremely probable that the "lycoctonine" of Hübschmann was simply a mixture of pseudaconine with more or less unaltered pseudaconitine, and possibly a little unaltered aconitine and bye-products, etc. A mixture of about equal quantities of pseudaconitine and pseudaconine does not crystallize from ether alone, but leaves a varnish almost instantly becoming solid and crystalline on touching with water; the crystals thus formed, when dissolved in ether and petroleum spirit, deposit by spontaneous evaporation crystals of impure pseudaconitine. From the marked resemblance between the physical properties of pseudaconine containing pseudaconitine, and those ascribed to "lycoctonine" by Hübschmann, Von Schroff, and Flückiger, together with their exact similarity in deportment with various reagents (*vide infra*), we have but little doubt that "lycoctonine" is really mainly pseudaconine, with more or less pseudaconitine, etc. Taking this into consideration with the apparent identity between aconine and "acolyctine" (§1), it may be fairly inferred that the roots of *A. Lycoctonum* contain both aconitine and pseudaconitine, and hence present no remarkable peculiarity as compared with the other species of aconites.

The following numbers were obtained with the apparently crystalline pseudaconine prepared as above described.

(1). 0·2410 gram gave 0·5000 CO_2 and 0·1815 H_2O.

(2). Another specimen; 0·2410 gram gave 0·5630 CO_2 and 0·1815 H_2O.

		Calculated.	Found (1).	Found (2).
C_{27}	324	63·90	63·36	63·71
H_{41}	41	8·09	8·37	8·37
N	14	2·76		
O_8	128	25·25		
	507	100·00		

The gold salt of pseudaconine, like that of aconine, appears to have a tendency towards spontaneous decomposition whilst drying; the purest specimen obtained gave these numbers:—

0·4840 gram dried over sulphuric acid gave 0·1145 Au = 23·65 per cent.

Calculated for $C_{27}H_{41}NO_8,HCl,AuCl_3 = 23{\cdot}17$ per cent. somewhat higher percentages were given by other specimens.

Pseudaconine does not seem to form salts that crystallize readily; our examination of its compounds, however, is not yet complete. In particular we propose to examine its behaviour with organic anhydrides, *e.g.*, benzoic anhydride, and to reproduce pseudaconitine from it, if possible. Its physiological action seems to be far less marked than that of aconitine or pseudaconitine. Solutions of its salts are bitter, and produce no tingling of the skin or lips.

Action of Alkalies and Acids on Pseudaconitine.

Pseudaconitine is saponified by alkalies quite as readily as aconitine, if not more so. If a little freshly precipitated alkaloid be boiled with ammonia, the action commences very rapidly. In a few minutes, if hydrochloric acid and ether be added, dimethylprotocatechuic acid is dissolved out in quantity. The same result is brought about on heating with sodium carbonate solution. Pseudaconitine itself, however, is sensibly soluble in sodium carbonate solution. On warming a saturated solution of the base in sodium carbonate the alkaloid separates out as a resinous film, containing but little pseudaconine, and capable of yielding crystals by solution in ether, addition of petroleum, and spontaneous evaporation. By continued heating of the sodium carbonate solution the pseudaconitine is almost wholly decomposed, little but resinous pseudaconine being contained in the base which separates as the solution becomes concentrated, and much dimethylprotocatechuic acid being obtained from the aqueous liquors on acidulation and shaking with ether.

As stated above, heating pseudaconitine with dilute alcohol for the purpose of recrystallizing it, saponifies a considerable quantity, so that only a fraction of the alkaloid used crystallizes out on cooling, the mother liquors giving much dimethylprotocatechuic acid on acidification, addition of water, and shaking with ether.

On heating pseudaconitine with inorganic acids, the same result is rapidly brought about; thus on heating with about 15 parts of strong hydriodic acid at 100 for three hours, 10·2 per cent. of dimethylprotocatechuic acid was obtained by treatment with ether; similar results were obtained with hydrobromic acid. (It is noteworthy that no methyl bromide or iodide was obtained in these experiments, indicating that dimethylprotocatechuic acid is not readily demethylized at 100°). Boiling with dilute sulphuric acid rapidly splits up pseudaconitine; on the other hand, the base may be boiled for several hours with tartaric acid without the formation of more than minute quantities of dimethylprotocatechuic acid. Hence, as with aconitine, tartaric acid is far preferable to sulphuric acid, for the purpose of acidifying the alcohol used in the first extraction of the alkaloids from the roots.

The following table exhibits the

Comparative Qualitative Reactions of Aconitine, Aconine, Pseudaconitine, and Pseudaconine

ALKALOID.	Weak bromine water.	Iodine dissolved in potassium iodide.	Mercuric chloride.	Mercuric bromide.	Mercuric iodide dissolved in potassium iodide.	Tannin.	Gold chloride.	Platinum chloride.	Sodium carbonate.	Ammonia.
ACONITINE.	Precipitate much more copious with stronger solution.	Copious precipitate scarcely affected by large dilution.	No precipitate with dilute solution; white precipitate with concentrated solution readily soluble on dilution.	Precipitate with dilute solution readily soluble on large addition of water.	Precipitate in dilute solution, scarcely affected by large addition of water.	No precipitate in dilute solution. Precipitate with concentrated solution readily dissolved on large addition of water.	Flocculent precipitate scarcely affected by large dilution.	No precipitate, save in very concentrated solution* readily soluble in water.	Precipitate sensibly soluble in excess on large dilution, but not very soluble.	Precipitate more soluble in excess on large dilution than with sodium carbonate.
PSEUDACONITINE.	Same as aconitine.	Same as aconitine.	Same as aconitine.	Same as aconitine.	Same as aconitine.	Same as aconitine.	Same as aconitine.	Same as aconitine.	Same as aconitine.	Precipitate almost as soluble in excess on large dilution as with sodium carbonate.
ACONINE.	No precipitate.	Precipitate readily soluble on dilution.	Precipitate only with most concentrated solution; readily soluble on dilution.	Precipitate only with moderately concentrated solution; readily soluble on large dilution.	Precipitate much more soluble on dilution than that given by aconitine.	Precipitate dissolved on dilution.	Precipitate in concentrated solution readily dissolved on adding large bulk of water.	No precipitate in moderately concentrated solution.	No precipitate under any circumstances.	No precipitate under any circumstances.
PSEUDACONINE.	Precipitate somewhat more scanty than with aconitine.	Same as aconitine and pseudaconitine.	Same as aconitine and pseudaconitine.	Same as aconitine and pseudaconitine.	Same as aconitine and pseudaconitine.	Precipitate in dilute solution dissolved on large further dilution.	Precipitate slightly dissolved on dilution, but much less so than that with aconine.	Same as aconine.	No precipitate unless tolerably concentrated solution; readily dissolved on dilution.	Same as with sodium carbonate.

The tests were made with solutions as nearly as possible of the same strength in each case, and consisting of the alkaloids dissolved in the least possible excess of hydrochloric acid, so as to give a slight acid reaction.

§ 3. *Alkaloids contained in various Aconite Species.*

The experiments described above (§§ 1, 2) seem to leave little room for doubt that the "acolyctine" and "lycoctonine" obtained by Hübschmann from *A. Lycoctonum* were really essentially decomposition products of aconitine and pseudaconitine respectively, and hence lead to the presumption that both these parent alkaloids exist in *A. Lycoctonum* roots. This appears also to be the case with both *A. Napellus* and *A. ferox*; the former of the two species, however, appears usually to contain aconitine in far the largest proportion, whilst in the latter species pseudaconitine greatly predominates. That *A. ferox* roots, as met with in commerce, contain aconitine, is indicated by the circumstance alluded to in § 2, that the product of the action in sealed tubes of water on pseudaconitine derived from *A. ferox* yielded on evaporation to dryness with sodium carbonate, a residue from which much pseudaconine was dissolved out by ether, leaving behind a small residuum of an alkaloid which, like aconine, was readily soluble in water, alcohol, and chloroform. Further, the crude dimethylprotocatechuic acid extracted from the product of the action by acidulation and treatment with ether contained notable quantities of benzoic acid; these were separated by long continued distillation with water, the dimethylprotocatechuic acid being not volatile under these conditions; the distillate yielded sensible quantities of benzoic acid on neutralizing with sodium carbonate, evaporation to a small bulk, acidification, and treatment with ether. The benzoic acid thus extracted from the pseudaconitine derived from Messrs. Hopkin and Williams's batch of alkaloid represented a content of something under 1 per cent. of aconitine. Similarly benzoic acid was extracted from the pseudaconitine worked up by Mr. Groves, in 1873 ('Year-Book,' 1873, 500), from Nepaul aconite, the quantity representing a little more than 1 per cent. of aconitine (*vide* § 4).

On the other hand, *A. Napellus* roots appear to contain pseudaconitine in some quantity, the evidence of the presence of this base being as follows:—During the working up of the *A. Napellus* extract as described to the Conference last year (Report No. 2), two batches of mother liquors were obtained, the one (A) from the successive crystallizations from ether and petroleum of the crude aconitine precipitated by potassium carbonate from the condensed extract prepared by M. Duquesnel's process; the other (B) being the potassium carbonate filtrate from this crude aconitine. From this filtrate a batch of alkaloids was extracted, as mentioned in Report 2, by precipitating with potassium mercuriodide, decomposing the precipitate by sulphuretted hydrogen, and finally treatment with sodium carbonate and ether. These two batches of alkaloid appeared to be much the same in general character, each being a mixture of at least five substances, viz., *aconitine*, prevented from crystallizing out by the others; *aconine*, formed by the partial decomposition of aconitine; *pseudaconitine; pseudaconine*, formed by the decomposition of pseudaconitine; and *a fifth base* containing a higher carbon percentage than any of these; this last has as yet not been isolated in a pure state. On dissolving these two mixtures in hydrobromic acid and allowing to stand some months, a very scanty crop of crystals of aconitine hydrobromide was obtained in each case; the mother liquors of these dried up to varnishes. On solution of these varnishes in water and pouring into excess of sodium carbonate solution, a separation was effected in each case of some of the constituents; precipitates were thrown down containing aconitine, pseudaconitine, some pseudaconine, and the fifth base; whilst filtrates were obtained containing the rest of the pseudaconine and the aconine. On cautious evaporation of these filtrates pseudaconine separated as resinous masses; whilst the final mother liquors evaporated to dryness and treated with ether yielded more pseudaconine in solution. On treating the portion insoluble in ether with chloroform, aconine and colouring matters were dissolved out. The pseudaconine thus obtained from the ethereal solutions corresponded exactly in all its characters with that above described (§ 2), and in particular in the apparent crystallization of the resinous alkaloids left on evaporation of the ethereal solutions on bringing them into contact with water; the following numbers were obtained:—

From (A) 0·2280 gram gave 0·5360 CO_2 and 0·1670 H_2O.

From (B) 0·3250 gram gave 0·7555 CO_2 and 0·2330 H_2O.

	Calculated.		Found. A.	Found. B.
C_{27}	324	63·90	64·12	63·38
H_{41}	41	8·09	8·14	8·03
N	14	2·76	—	—
O_8	128	25·25	—	—
$C_{27}H_{41}NO_8$	507	100.00		

The two precipitates thus obtained with sodium carbonate were dissolved in acid and reprecipitated by sodium carbonate for the purpose of removing pseudaconine. The residual alkaloids were then collected, washed, and dried; white amorphous brittle masses were thus obtained, not unlike starch in appearance. In acids these white masses dissolved readily but the solutions would not crystallize. On combustion these masses gave the following numbers; at 100° they did not melt, but slightly fritted together:—

From (A) 0·2950 gram gave 0·7120 CO_2 and 0·2065 H_2O.

From (B) 0·2975 gram gave 0·7140 CO_2 and 0·2030 H_2O.

	A	B
Carbon	65·83	65·46
Hydrogen	7·78	7·58

It is hence evident that a large quantity of some base was present containing more carbon than any of the bases yet examined, the highest percentage being found in pseudaconitine (C = 64·38 hydrogen = 7·30 per cent.); these two precipitates consisted mainly of this substance, with a little unaltered aconitine and a minute amount of pseudaconitine; for they produced a slight amount of liptingling, very far inferior to that produced by either aconitine or pseudaconitine in a pure condition; and on treating with water in sealed tubes for twenty-four hours, each partially dissolved, giving rise to a small quantity of a mixture of benzoic and dimethylprotocatechuic acids, the former largely predominating, so that the mixture of acids melted at close upon 120°, whilst it formed protocatechuic acid on fusion with caustic potash at 250°. It hence seems very probable that the more highly carburized base is comparatively physiologically inert, the little activity exhibited by these two precipitates being presumably due to the small quantity of aconitine and pseudaconitine therein contained.

Is is hence manifest that the *A. Napellus* roots examined last year (Report No. 2) contained the following alkaloids:—

Aconitine $C_{33}H_{43}NO_{12}$ in considerable quantity: about one half of the total alkaloids present.

Pseudaconitine $C_{36}H_{49}NO_{11}$ in less quantity: estimated at about 10 per cent.

Another base of higher carbon percentage in considerable quantity; estimated at about 40 per cent.

Whilst the extract worked up from these roots contained in addition:—

Aconine $C_{26}H_{39}NO_{11}$ in small quantity.

Pseudaconine $C_{27}H_{41}NO_8$ to a somewhat larger extent.

These two bases being probably simply derived from the decomposition during extraction of aconitine and pseudaconitine.

In order to see if the base containing the higher percentage of carbon was also present in the alkaloid obtained from Messrs. Hopkin and Williams, the mother liquors of the ether-petroleum crystallization of the alkaloid as purchased were dissolved in acid and added to excess of sodium carbonate. A copious precipitate was then thrown down which was drained on the pump-filter, dissolved in ether and allowed to crystallize spontaneously after addition of petroleum. A crop of crystals of imperfectly pure pseudaconitine was then obtained; the mother liquors left finally were dissolved in hydrochloric acid, precipitated by sodium carbonate, and submitted to combustion after washing and drying; the substance fused completely at 100°.

0·2640 gram gave 0·6470 CO_2 and 0·1990 H_2O

Carbon 66·83.

Hydrogen 8·37.

It is hence evident that a base containing more carbon than pseudaconitine was present; but the difference in behaviour of this substance and the analogous product from *A. Napellus* at 100°, and the higher hydrogen percentage, would seem to indicate that the *A. Ferox* more highly carbonized base is not identical with that from *A. Napellus*. It is noteworthy that the above numbers are very close to those obtained by Von Planta, on analysis of a specimen of commercial "aconitine" (*Annalen der Chemie*, 74, 257), viz.:—

	One sample.			Another sample.	
Carbon	67·81	68·34	67·75	64·83	66·95
Hydrogen	8·82	8·90	8·64	8·14	8·59
Nitrogen	—	3·59	3·31	—	—

From these numbers, Von Planta deduced the formula $C_{30}H_{47}NO_7$, which was for long attributed to "aconitine."

Inasmuch, however, as the process of Geiger and Hesse in use at that time for the extraction of the aconite alkaloids involved heating successively in contact with sulphuric acid and with lime, it is evident that pseudaconitine and aconitine must have been largely decomposed; and hence it is very probable that the bodies examined by Von Planta consisted largely or wholly of this unnamed alkaloid.

The sodium carbonate filtrates from the two precipitations just described yielded on evaporation an alkaloid or mixture of alkaloids, in which pseudaconine appeared to predominate, as the ethereal solution dried up to a varnish, which became apparently crystalline on moistening with water. Of this—

0·3345 gram gave 0·7955 CO_2 and 0·2550 H_2O.

	Calculated for Pseudaconine.	Found.
Carbon . . .	63·90	64·87
Hydrogen . . .	8·09	8·47

From the somewhat high percentage of carbon it is probable that some of the amorphous unnamed base was also present; a little unaltered pseudaconitine was present, as a small quantity of dimethylprotocatechuic acid was obtained from the mixture on saponification.

It hence results that the alkaloidal substance manufactured by Messrs. Hopkins and Williams contained the following constituents.—

Pseudaconitine $C_{36}H_{49}NO_{11}$ in largest quantity.
Aconitine $C_{33}H_{43}NO_{12}$,, small ,,

Pseudaconine and amorphous unnamed base each in some quantity. The amounts of each of these substances have been approximately determined quantitatively (*vide* § 4).

§ 4. *Processes for Assaying Specimens of Commercial Aconite Alkaloids.*

In order to determine with approximate accuracy the relative amounts of pseudaconitine and other bases present in the substance obtained from Messrs. Hopkin and Williams the following method of analysis was adopted: it is evident that the process can be utilized as a means of assaying the comparative value of commercial specimens of alkaloid—

0·7895 gram lost at 100° 0·0335	=	4·2 per cent.
2·3040 gram dissolved in hydrochloric acid and treated with ether, furnished 0·010 gram of residue left on spontaneous evaporation of ether, consisting of resinous matter with a little dimethylprotocatechuic acid (probably formed by decomposition of pseudaconitine whilst the preparation was drying in Messrs. H. and W.'s factory) - -	=	0·4 ,,
2·0230 gram, heated to 240-250 in a sealed tube for 24 hours with water yielded with hydrochloric acid and ether 0·3660 gram of mixed benzoic and dimethylprotocatechuic acids, with traces of resin	=	18·1 ,,
On distillation with water 0·002 grams of benzoic acid was obtained melting at 119° - - - - -	=	0·1 ,,

Admitting, as seems most probable from the above described experiments, that this benzoic acid was derived from aconitine present, 0·1 per cent. of benzoic acid would correspond to 0·6 per cent. of aconitine, since pure aconitine has been found experimentally to yield about one-sixth of its weight of benzoic acid (§ 1). On the other hand, it may be fairly assumed that *pure* pseudaconitine would yield 25 per cent. or one-fourth of its weight of dimethylprotocatechuic acid, since close upon 23 per cent. was actually obtained from specimens known to be not wholly pure (§ 2), whilst the theoretical value is 27·1 per cent.; hence the percentage of pseudaconitine will be 70·4 as shown by the calculation below.

Total dimethylprotocatechuic and benzoic acids and resin obtained	=	18·1 per cent.
Resin and pre-existing dimethyl protocatechuic acid - - - -	=	0·4 ,,
Acids due to pseudaconitine and aconitine present - - - -	=	17·7 ,,
Benzoic acid due to aconitine -	=	0·1 ,,
Dimethylprotocatechuic acid due to pseudaconitine - - -	=	17·6 ,,

Percentage of pseudaconitine = 17·6 × 4 =	70·4
Ditto of aconitine . . . = 0·1 × 6 =	0·6
Water . . . . =	4·2
Pseudaconine and amorphous unnamed base, etc. (by difference) . =	24·8
	100·0

That is, the percentage of pseudaconitine is practically four times the percentage of dimethylprotocatechuic acid obtained (after making correction for resin, pre-existing acid, and benzoic acid); whilst the aconitine is practically six times the benzoic acid obtained.

Similarly, a sample of impure pseudaconitine was assayed. This had been obtained by Mr. Groves in 1873, and was described by him ('Year-Book,' 1873, p. 504) under the name of "amorphous pseudaconitine," being the substance referred to as "Specimen F," in first report ('Year-Book,' 1875, p. 515); this was found, by treatment with acid and sodium carbonate, solution of precipitate in ether, addition of benzoline, and spontaneous evaporation, to contain much crystallizable pseudaconitine, the crystallization of the original substance being impeded by other products, notably pseudaconine and dimethylprotocatechuate of pseudaconitine, which were to a large extent removed in the sodium carbonate filtrate by this treatment.

Percentages found.		Calculated Composition.	
Total acid and resin	=17·7	Pseudaconitine . . 16·2 × 4 =	64·8
Resin and pre-existing acid . . .	= 1·3	Aconitine . 0·2 × 6 =	1·2
	16·4	Water . . . . =	4·2
Benzoic acid .	= 0·2	Pseudaconine, etc. (by difference) .	=29·8
Acid due to pseudaconitine . . .	=16·2		100·0
Loss at 100 .	= 4·2		

Probably the water present in this, and the preceding specimen, existed as a hydrate of pseudaconitine, the substance having been precipitated from aqueous solution by alkalies. The formula $C_{36}H_{49}NO_{11},2H_2O$ requires 5·09 per cent. of water, so that substances containing 70·4 and 64·8 per cent. of pseudaconitine as this hydrate should also contain respectively 3·58 and 3·30 per cent. of water.

This process for the quantitative examination of aconite alkaloids can, of course, only give correct results in the event of no other substances being present that will yield on saponification with water either benzoic or dimethylprotocatechuic acid. Experiments now in progress, however, seem to indicate that the amorphous comparatively inert base capable of yielding well crystallized salts obtained by Mr. Groves from one batch of *A. Napellus* roots (Base "A" of 'Year-Book,' 1875, p. 514) is capable of also yielding benzoic acid on similar treatment. Should this prove to be the case, the determination of the amount of aconitine present by the above process will be incorrect, and the method must be modified in cases where the amount of benzoic acid yielding alkaloid present is at all considerable; a modification which appears to give results sufficiently satisfactory for practical purposes, consists in dissolving the alkaloid to be tested in dilute hydrochloric acid, and pouring the solution into sodium carbonate solution. By suitably regulating the strength of the solution, it is possible to get a tolerable separation of aconitine, and the other base (to which it is proposed to apply the term *Picraconitine*, on account of its bitter taste), the latter being readily soluble in excess of the reagent, the former but sparingly soluble. By then saponifing the precipitate and determining the benzoic acid thus produced, an estimate of the amount of aconitine present can be obtained; whilst the picraconitine can be deduced from the difference between the total benzoic acid formed and that thus obtained from the precipitated aconitine.

In the case of a crystallized salt of aconitine (more or less mixed with picraconitine) this method of separation has been found to answer fairly, and with a correction for the solubility of aconitine in sodium carbonate solution, still nearer approximations can be obtained. On these points experiments are in progress.

§ 5. *Conclusions.*

From the experiments just described, together with those detailed in the previous reports, and the results obtained previously by Groves, Duquesnel, Hübschmann and others, the following conclusions may be drawn:—

(1.) *A. Napellus* roots as met with in commerce contain a highly active crystallizable alkaloid, furnishing readily crystallizable salts. This is distinguished as *Aconitine*, and is represented by the formula $C_{33}H_{43}NO_{12}$. In addition they contain more or less of another active alkaloid, crystallizable, but not readily yielding crystallized salts. This is distinguished as *Pseudaconitine*, and is represented by the formula $C_{36}H_{49}NO_{11}$. Moreover they contain (or at least the extract of the roots does) more or less of the decomposition products, produced by the saponification of these bases in accordance with the reactions.

$$\underset{\text{Aconitine.}}{C_{32}H_{43}NO_{12}}+H_2O=\underset{\text{Benzoic Acid.}}{C_7H_6O_2}+\underset{\text{Aconine.}}{C_{26}H_{39}NO_{11}}$$

$$\underset{\text{Pseudaconitine.}}{C_{36}H_{49}NO_{11}}+H_2O=\underset{\text{Dimethyl-protocatechuic Acid.}}{C_9H_{10}O_4}+\underset{\text{Pseudaconine.}}{C_{27}H_{41}NO_8}$$

And further, an alkaloid apparently non-crystalline, and yielding non-crystalline salts, and containing a higher carbon per centage than any of these other bases is also present. This seems to be of little physiological potency.

One batch of roots worked up by Mr. Groves contained besides aconitine an entirely different base, not crystallizing itself, but giving well crystallized salts. This base is comparatively inactive, and its salts are bitter and produce no lip-tingling, whence the name *Picraconitine* is assigned to this base, its formula being $C_{31}H_{45}NO_{10}$.

(2.) *A. ferox* roots contain comparatively large quantities of *Pseudaconitine* with a little *Aconitine*, and an alkaloid apparently non-crystalline and yielding non-crystalline salts, and containing a higher carbon percentage than any of the other bases. Apparently this is not identical with the analogous body from *A. Napellus*. The substance from which Von Planta deduced the formula $C_{30}H_{47}NO_7$ probably mainly consisted of this base.

(3.) *A. Lycoctonum* roots appear to contain both aconitine and pseudaconitine, the substances thence extracted by Hübschmann, and termed by him "Acolyctine" and "Lycoctonine," being apparently simply alteration and decomposition products of aconitine and pseudaconitine in a more or less pure state.

(4.) So called "Aconitine" of commerce is a mixture of true aconitine and pseudaconitine, with variable quantities of their alteration products, aconine and pseudaconine, and of the amorphous unnamed alkaloids above alluded to. The "Napelline" found by Hübschmann in commercial "aconitine" having been found by that chemist to be identical with his "Acolytine," is doubtless simply one of these decomposition products, viz. aconine, in a more or less pure condition.

(5.) The processes in ordinary use for the isolation of commercial "aconitine," are such as must inevitably bring about a large loss of active alkaloids through the saponifying actions above alluded to. The products of these actions are apparently far less physiologically active than the parent bases. In order to diminish this loss, the process of M. Duquesnel (use of tartaric acid) is far preferable to the ordinary methods (employment of hydrochloric or sulphuric acid). The crude alkaloids can be readily purified by crystallization from ether and petroleum spirit. True aconitine, $C_{33}H_{43}NO_{12}$, should further be converted into a crystallized salt if perfect purity is required. Unless crystallization of the alkaloids be employed the products obtained will contain (besides other impurities) more or less of the unnamed amorphous alkaloids of higher carbon percentage.

(6.) A method of assay applicable both to *A. Napellus* and *A. ferox* alkaloids has been arrived at, by which the amount of each physiologically active alkaloid present can be obtained with sufficient accuracy for practical purposes. It is probable, that if manufacturers would supply an article at a constant strength (say 30 per cent., 50, 70, or the like), as determined by this process, complaints as to irregularity in the efficacy of commercial "aconitine" would cease, whilst so doing would in many cases render it unnecessary to purify by crystallization the crude alkaloid. If attempts are made to prepare only pure or approximately pure alkaloids, much waste will occur in the form of mother-liquors, uncrystallizable masses retaining much of the active bases, etc. These, however, might readily be utilized for diluting to a fixed standard batches of the commercial article, which happen to be above the standard in the first instance.

(7.) From the ease with which both aconitine and pseudaconitine decompose by saponification, it seems extremely probable that *liquid* preparations, such as tinctures, will gradually lose activity on keeping. This must inevitably occur where the liquids are neutral or alkaline, and will probably occur to some extent when the alkaloids are kept in solution, as salts of organic acids, for lengthened periods.

(8.) Aconitine and pseudaconitine, although allied in physiological action and to some extent in chemical characters, do not seem, as far as experiments have as yet gone, to have a common nucleus or radical. They are allied, as regards their principal decompositions, to the opium alkaloids, narcotine, oxynarcotine, and narceine, which again are akin to the products obtained from the alkaloids morphine and codeine by treating them with the anhydrides of organic acids. From experiments now in progress, they appear also to be allied to veratrine; whilst the results of Kraut and of Lossen indicate a certain amount of analogy between aconitine, atropine, and cocaine, benzoic acid having been obtained by these chemists by the splitting up of the latter two bases.

The President suggested that the next paper, being on a similar subject, should be read, in order that both might be discussed together.

Preliminary Account of the Alkaloids from Japanese Aconite.

BY B. H. PAUL, PH.D., F.C.S., AND CHARLES T. KINGZETT, F.C.S.

This preliminary investigation was undertaken at the request of Mr. E. M. Holmes, who had been examining the structure of the particular roots which formed the subject of our studies.

The roots were known to be genuine, having been imported direct from Japan.

In our experiments 3940 grms. (or 8·6 lbs.) were subjected to the process of M. Duquesnel.

The ground material was first extracted with cold benzoline. This extract on distillation left a dark liquid behind, from which ether in the presence of tartaric acid removed no alkaloid.

The root was then thoroughly extracted with cold alcohol containing 1 per cent. tartaric acid, and the extract distilled to a low bulk. Water was now added and the mixture filtered from the fat-like precipitate and subjected to further treatment according to Duquesnel's method,* that is to say, it was extracted with ether in the presence of bicarbonate of sodium, and the alkaloid obtained in a crude state by distillation of the ether.

In this way, 7·17 grms. of crude mixed alkaloids were obtained; a quantity equivalent to about 0·18 per cent. or 13 grains to the pound. Duquesnel obtained 0·06 to 0·4 per cent., and Wright from 0·03 to 0·07 per cent. in operating upon roots of *A Napellus*.

The crude alkaloid obtained as described was somewhat coloured: from its ethereal solution needle-like crystals formed on standing. This crystalline substance presented the following characters:—

Very sparingly soluble in water.

Soluble in cold alcohol (65 per cent.).

Extremely soluble in dilute acids or water faintly acidified.

Not precipitable from aqueous solution by platinic chloride.

When converted into hydrochloride, however, platinic chloride gave a bulky precipitate soluble in cold spirit. When the platinum precipitate thus obtained was boiled in water, a part became viscid and fused, while another part dissolved and was reprecipitated on cooling.

On boiling for an hour with a very dilute solution of sulphuric acid a solution was obtained which reduced Fehling's test.

The whole quantity was now several times recrystallized from ether, and then from warm dilute alcohol several times also, the later recrystallizations being effected upon solutions which had been rendered practically colourless by animal charcoal. In the earlier recrystallizations a varnish-like substance was deposited upon the sides of the dish along with the crystals. From its greater solubility in the alcohol the crystals were ultimately obtained in a white state and free from this uncrystallized substance. As thus seen, no definite shape could be distinguished in the crystals; they were chiefly crystalline plates and needles, and less than 2 grms. were ultimately obtained in a fit state for analysis. A part of this was finally recrystallized, washed with water, dried at 100° C. (without change of any sort) and analysed.

(a) 0·270 grm. gave 0·623 grm. CO_2 and 0·192 grm. H_2O.

(b) 0·3135 grm. gave 0·218 grm. H_2O.

(c) 0·3230 grm. gave 6·63 c.c. N normal, which required no correction:—

Theory of $\underbrace{C_{29}H_{43}NO_9}$		Found. Per cents.	÷ At. Wgts.	÷N=1.
63·38	C.	62·926	5·2439	28·6
7·83	H.	(a) 7·900 (b) 7·726	7·900	43·1
2·55	N.	2·567	·183	1·0
26·23	O.	26·607	1·662	9·0

Having now obtained the base, we desired to compare it with other substances which have been described and which may be obtained commercially under the name of aconitine.

It is as unnecessary as it would be laborious to attempt a complete *résumé* of all that has been done and written about the aconite bases. The real knowledge possessed regarding them is very limited, and may be expressed very briefly. Doubtless, many of the substances which have formed the subjects of study by chemists have been mixtures or impure, hence it results that nearly every experimenter has arrived at a different formula for the base constituting in his opinion the primary one. Others have concluded that aconite yields two bases, while yet others believe that a whole series of closely related alkaloids are to be obtained from the various roots.

MM. Gréhant and Duquesnel* describe aconitine as a substance which crystallizes in rhombic or hexagonal plates, having a composition represented by the formula $C_{27}H_{40}NO_{10}$. It is said to be very soluble in alcohol, ether, benzene and chloroform, while the acetate is described as highly crystallizable. In another communication† Duquesnel has expressed the opinion that aconitine is a glucoside, but he does not give grounds for this belief. He further says that both glacial phosphoric acid and sulphuric acid give with the base a violet colour, and that the auric and platinic chloride combinations of the alkaloid are soluble in alcohol.

Groves has worked extensively with the alkaloids of aconite, and more recently Wright has subjected his products to ultimate analysis.

In one of his many papers,‡ Mr. Groves says the aconitines of commerce are partly crystalline. Aconitine is described as giving a precipitate with platinic chloride, and a nitrate whose crystals consist of rhombic prisms with dihedral summits; the alkaloid is precipitated from the nitrate by means of ammonia.

In Germany§ a difference was recognized between the English and German preparations, and the existence of two alkaloids was assumed. The name aconitine was applied to the German alkaloid, while the names napelline, nepaline, acraconitine, pseudaconitine were given to the English preparation.

The German substance was said to be coloured violet by phosphoric acid when applied in the hot concentrated state. It was described as yielding no platinum salt (insoluble in water), while the English substance was said to give no colour reaction either with sulphuric acid or phosphoric acid. The English alkaloid was further described as being not very soluble in ether or alcohol, although its alcoholic solution was said to crystallize readily.

Flückiger, on the contrary, came to the conclusion that the English and German alkaloids were identical.

Stahlschmidt and von Planta both give to aconitine the formula $C_{30}H_{47}NO_7$.

Wright,|| in conjunction with Mr. Beckett, and subsequently alone, has submitted the subject of aconite alkaloids to a fresh investigation. Groves had obtained from *Aconitum ferox* a base regarded by him as peculiar to that species of root. It crystallized from ether, but yielded salts which would not crystallize. Wright analysed this, and gave to it the formula $C_{36}H_{49}NO_{11}$, and to the gold salt $C_{36}H_{49}NO_{11}$,HCl, $AuCl_3$. This alkaloid had been extracted by means of alcohol acidulated with hydrochloric acid and the extract had been evaporated down. Now were any of the alkaloids thus extracted of the nature of glucosides, this process would be a most effectual one for their decomposition into glucose and other bodies. How far therefore the body analysed by Wright is to be regarded as a primary consitutent of *Aconitum ferox* it is difficult to decide.

A second product also isolated by Mr. Groves, and obtained from *A. Napellus*, was converted from the nitrate by means of ammonia into the free base which crystallized from ether. This body contained 62·7 to 62·9 per cent. C. and 7·2 to 7·3 per cent. hydrogen; the nitrogen was not determined, but Wright first gave to it a formula $C_{32}H_{43}NO_{10}$, and then afterwards regarded it as an impure or altered body; not from a further examination of it but from distinct results.

Wright rejects Duquesnel's formula $C_{27}H_{40}NO_{10}$ as

* See *Pharm. Journ.* [3], ii., p. 226; vii., p. 1040.

* *Pharm. Journ.* [3], vol. ii., p. 226.
† *Pharm. Journ.* [3], vol. ii., p. 602.
‡ *Pharm. Journ.* [2], vol. viii., p. 118.
§ *Pharm. Journ.* [3], vol. i., p. 121.
|| *Journal of the Chemical Society*, Feb., 1877.

incorrect, and arising from an imperfect separation of the bases obtained from *A. Napellus*. He says repeated crystallizations do not suffice to separate the two, viz., aconitine which is crystalline and picraconitine which dries up as a varnish.

Two bases are therefore recognized by Wright as existing in *A. Napellus*, viz., picraconitine—an uncrystallizable alkaloid, comparatively inert, yielding crystallizable salts (this often preponderates); and aconitine which is crystalline, and whose salts are crystalline.

To picraconitine Wright assigns the formula $C_{31}H_{45}NO_{10}$ and he gives to its crystallizable hydrochloride that of $C_{31}H_{45}NO_{10}HCl,1\frac{1}{2}H_2O$; a formula which is in our opinion inadmissible. In the analysis of the hydrochloride, Wright obtained more carbon than this theory requires, but less nitrogen, and with the exception of this one instance Wright has not given nitrogen determinations. These are circumstances entirely opposed to general experience, and they suggest the suspicion that Wright's formula is incorrect. At the same time the free base appears to have yielded the theoretical percentage of carbon.

To get aconitine pure, Wright says it is necessary after recrystallizing it from ether to make a crystalline salt, preferably the hydrobromide, and to regenerate the base from this by sodic carbonate in the presence of ether. To pure crystallized aconitine Wright gives the formula $C_{33}H_{43}NO_{12}$, but no nitrogen determinations are given, and several features are presented which raise doubt as to the correctness of this view. Thus in an analysis of the "pure base" he obtained 61·71 per cent. carbon against 61·39 required by theory.

In a further investigation Wright followed Duquesnel's process and confirmed the results of examination of his own preparations by comparison with those obtained with Mr. Groves' products; but, here again nitrogen determinations are entirely neglected, and this is really a serious consideration from the fact that very different substances, capable alike of forming gold salts or hydrochlorides may present similar percentages of carbon and hydrogen; and to reason that because the chlorine or the gold bears a certain atomic ratio to the carbon, therefore nitrogen bears a like atomic ratio to the carbon, is a most dangerous assumption. Above all things in importance is the relation of nitrogen to carbon in such compounds.

The numbers we obtained by analysis of the alkaloid from Japanese aconite agree best with the formula $C_{29}H_{43}NO_9$, and they are not comparable with those obtained by Wright for his crystallizable alkaloid (aconitine). Moreover, unlike the alkaloid he describes, the one we obtained gives no crystallizable salts, or, at least, none have been obtained, although many and various attempts were made to get them. The alkaloid was intensely bitter and it gave, on boiling with dilute sulphuric acid, a solution which readily reduced Fehling's test. By way of comparison, German aconitine, French aconitine, and Morson's aconitine were similarly treated. The French and Morson's preparations behaved, in this respect, like ours, but the German preparation gave an absolutely negative result. These preparations also refused to yield crystalline salts; it is true the acetates, especially that of Morson's, showed signs of crystallization, but practically the hydrochlorides, nitrates, and acetates dried up to varnishes.

The free alkaloid prepared as described did not fuse or change colour at 100° C, nor did it fuse or agglomerate in any measure in the way presented by the other three preparations alluded to, when boiled in water.

The varnish like substance which accompanied the crystalline substance has not been examined particularly, except that it has not been possible to obtain crystallizable salts from it. An interesting and important result however was obtained from an examination of the watery-alcoholic mother liquors left after the crystallization of the pure alkaloid, and containing this uncrystallizable substance. It was found that on addition of ammonia to the solution, a very bulky white precipitate was thrown down, having all the characters of the crystallizable alkaloid. From the very sparing solubility of that alkaloid in water it appeared that it must have existed in combination as a salt, and to test this the ammoniacal filtrate was evaporated to dryness. In this way there was obtained a gum-like mass, which dissolved in water and gave a bulky precipitate with lead acetate, containing when dried at 100° C., 50·82 per cent. lead. As aconitine is supposed to exist in aconite roots, etc., in combination with aconitic acid ($C_6H_6O_6$), and since aconitic acid, as well as the alkaloid, is soluble in ether, it is conceivable that the compound would be extracted, at least partly, by Duquesnel's process, for it is not probable that tartaric acid would effect its decomposition. In such case some process like that of Sonnenschein's, employing phosphomolybdic acid, would have to be employed in order to obtain absolutely satisfactory evidence of the composition of the aconite alkaloid.

The question, therefore, arises whether many of the substances which have been analysed as aconitine were not really aconitate of aconitine. Pure aconitate of lead represented by the formula $3\,Pb\,2(C_6H_3O_6),3\,H_2O$ requires 61 per cent. lead. A further quantity of the lead salt alluded to above was obtained, washed, and decomposed with sulphuretted hydrogen. The filtrate had an acid reaction, and on evaporation to dryness left an acid gummy residue not unlike aconitic acid. On treating the French, German and Morson's preparations by heating them to about 90° C. with water, a quantity was dissolved in each case. This was continued until ammonia no longer gave any precipitate with the filtrates, and on evaporation of the ammoniacal solutions, a substance was obtained in each case resembling the ammonium salt of aconitic acid.

To revert to the method of obtaining the alkaloids, it will be seen that the solution of acid tartrate was decomposed by sodic bicarbonate and the mixture extracted by ether. The alkaline solution remaining after this was rendered acid by nitric acid and the solution fully precipitated by phosphomolybdic acid. A somewhat bulky precipitate was thus obtained; it was decomposed after washing with water acidulated with sulphuric acid, by means of baryta water, and the excess of this reagent removed by carbonic anhydride, the last traces being taken out exactly by very dilute sulphuric acid, which was added to neutrality. The dark coloured fluid thus obtained deposited only a viscid brownish mass on evaporation over sulphuric acid.

The solution had the following characters:—

It gave with ammonia no precipitate.

It gave with potash a bulky precipitate.

It gave with a solution of mercuric chloride in excess of potassic iodide, a bulky precipitate.

It gave with a watery solution of iodine, a precipitate.

When acidified slightly with hydrochloric acid, platinic chloride gave a small precipitate, soluble in alcohol, and containing about 28 per cent. platinum.

Although these characters are not distinctive, they at least indicate the presence of an alkaloid capable of isolation in the manner described. After the precipitation by platinum, the bulk of the substance was left in solution.

In recapitulation of the results above described it may be said that the Japanese aconite examined by us has yielded a crystallizable alkaloid of the formula $C_{29}H_{43}NO_9$, which does not give crystallizable salts; a further substance which behaves as a salt of the crystalline alkaloid but is itself uncrystallizable; from which it appears that a certain part at least of the alkaloid is in combination (as extracted by Duquesnel's process) with an acid, perhaps aconitic; moreover, Duquesnel's process does not extract all the alkaloidal matters from aconite root.

The President said these were two papers on a very important subject, by gentlemen who could hardly be surpassed either in their knowledge of the subject or power of working it out, and one or two points presented themselves in connection with it. They had been accustomed for many years to look to the extraction of the active principles, the alkaloids especially, which were found in the vegetable kingdom, which possessed, as a rule, very powerful and often valuable medicinal properties, and to their use either in an isolated state or in a subsequently artificially combined state, as affording the best if not the only security for anything like uniformity in the preparations administered. The results now brought forward, however, rather tended to weaken the feeling of confidence hitherto reposed in the use of these active principles in their isolated condition. It appeared with reference to aconitine that in the very process of isolation it was subject to very material changes; that a body which was one of the most powerful poisons known to the medical profession, a small fraction of a grain of which would produce death under the most painful circumstances, was liable even by the mere action of heated water to split up, yielding a product which was inert; and that by various chemical actions, to which the body was necessarily subjected in its production, a variety of products more or less inactive were produced. It certainly appeared that the aconitine which had been used in medicine hitherto had never been the pure aconitine in an unmixed condition; and many medical men were perfectly aware of this fact. He recollected hearing the late Mr. Morson—who was a manufacturer of aconitine and who made it, he believed, for the physician who first introduced it in medicine in this country—say, that he had known that gentleman come into his establishment and when shown a specimen of foreign made aconitine, fearlessly taste it, so convinced was he of its want of energy. Fortunately, this substance was rarely if ever used internally, but only externally; still it was a serious consideration that they were constantly using a body of this description, so powerfully poisonous, but which so readily underwent change that there was great difficulty in obtaining it in a state of purity. He would now invite discussion on these valuable papers.

Mr. Holmes said there were only three species of aconite at present known to occur in Japan: *A. Lycoctonum*, L., *A. Fischeri*, Reich., and *A. uncinatum*, L. The root received in commerce appeared to consist in large measure of one kind only, which Mr. Greenish had lately examined for him, and it appeared to possess a very different structure from the ordinary *A. Napellus*, and the root itself certainly was much stronger in taste. Dr. Paul had called attention to some of the specimens having a horny or resinous appearance, while the majority were starchy; but the same feature appeared in *A. ferox* and was probably due to the drying or some other cause with which they were not acquainted, rather than to any difference in species. One source of difficulty in dealing with this subject was that it was almost impossible in commerce to get specimens of one kind of root only, and therefore it was necessary to be very careful in speaking of results. The German aconite consisted chiefly of two species: the *A. Napellus* and *A. Stoerckanum*. In the case of the Japanese aconite of commerce they had no certain knowledge that more than one species did not occur, and the varying results obtained by analysis might therefore be owing to the presence of different species of root; and until one species exclusively was cultivated in this country, so that it might be thoroughly examined, it was impossible to come to any definite conclusion with regard to the alkaloids of any one species.

Mr. J. F. Walker asked whether the compound in which the benzoic radical replaced hydrogen in pseudaconine had been obtained.

Dr. Wright replied not yet. This was only a preparatory report.

Mr. Greenish said that having been for some time engaged in the microscopic examination of aconite roots, he had found that those imported were always more or less mixed, no matter whether they came from Germany or elsewhere. With regard to the Japan aconite there were certainly two roots; he could not say of two different species, but one was a very tuberous root, evidently a young one, and another was longer and shrivelled, being older. Dr. Paul had made a remark that the root was very starchy; and a transverse section of the tuberous root showed this; and when the starch was removed there was nothing left but a clean, clear, cellular tissue, with the fibrovascular bundles. In the case of the shrivelled root the cellular tissue had upon it a deposit of a resinous character, and having been accustomed now and then to put a section into his mouth when cutting, he had arrived at the conclusion that the tuberous root, which formed by far the largest proportion of the Japan aconite, did not contain so much of the pungent principle as the older and longer root. The Japan species was certainly not, in his opinion, *A. Napellus* the histological character being quite different. It had generally a much larger number of fibrovascular bundles in a transverse section than *A. Napellus*. It seemed to him clear that pharmacists could never make preparations of a definite strength until they knew in the first place the relative proportions of young roots as compared with old ones, and whether they were all of one species; and secondly whether the root in Japan was cultivated or not, because the cultivation of the aconite certainly diminished its active properties.

Mr. Umney said it would be very useful if it could be elicited which of the aconites was most powerful. In commerce, large parcels of Japan aconite were occasionally to be met with; sometimes parcels of the large root known as Nepaul aconite (*Aconitum ferox*) were offered for sale, while German aconite root was generally obtainable. All these were used in the manufacture of preparations which were used internally, as well as for liniments. His own impression was that the Nepaul aconite was the strongest. The men employed in crushing the roots in drug mills complained very much of the Japan root as causing a very powerful tingling sensation.

Mr. Greenish did not think this effect was so much due to the greater intrinsic strength as to the starchy character of the root which would cause it to be diffused in the atmosphere. The starchy matter of *A. ferox* was converted probably by the heat in the process of drying into dextrine, and, therefore, when this root was crushed it did not diffuse in the atmosphere.

Mr. Gerrard said he agreed with what was stated in Dr. Paul's paper that the amount of the alkaloid contained in the Japanese aconite was far beyond that given by Duquesnel and Dr. Wright, and that he himself had also obtained another substance with the nature of which he was not acquainted. On the addition of caustic lime and the removal of the precipitated alkaloid by ether, and the addition of carbonate of potash, an alkaline precipitate was obtained which did not crystallize from its solution in ether. With reference to the different strength of preparations of aconite, the liniment made from the Japanese variety was certainly not admissible, by the side of that made from the ordinary aconite root of commerce, for it was double the strength and caused intense irritation when applied externally. In fact, when working with it, it was necessary to envelop the face with some kind of gauze in order to prevent ill effects, and severe numbness of the hands had been caused by contact with the powdered root mixed with spirit.

Professor Attfield agreed with the President that the present condition of pharmacists in relation to aconite had been shown by recent investigations to be a very foggy one, but if so, their previous condition was one of mere chaos, and it might be expected that when more light was thrown on the matter by the very luminous constellation forming the Committee, they might so clearly see their way as not only to be able to prepare aconitine most usefully, but also how best to make the different galenical preparations of aconite. He should therefore be glad to hear from Dr. Wright whether he considered the investigation was one to which the Conference might usefully make a further grant.

Mr. KINGZETT said Dr. Wright, in his researches on the aconitines, seemed to have arrived at the conclusion that there were three distinct alkaloids, the first in importance being aconitine, $C_{33}H_{43}NO_{12}$, which is crystalline and gives crystallizable salts; the second alkaloid being picraconitine, $C_{31}H_{45}NO_{10}$, itself noncrystalline, but furnishing crystalline salts; and pseudaconitine, $C_{36}H_{49}NO_{11}$, said to be crystalline, but yielding salts which dry up to varnishes. In contrast with these results, the alkaloid obtained by Dr. Paul and the speaker was crystallizable; its salts however were uncrystallizable and its formula $C_{29}H_{43}NO_9$. Now, among other extraordinary matters Dr. Wright had assigned * to the hydrochloride of picraconitine the formula $C_{31}H_{45}NO_{10},HCl,1\frac{1}{2}H_2O$. He (Mr. Kingzett) contested that such a formula was incompatible with our present ideas of chemistry; the molecule of an organic body could not be associated with one and a half molecules of water. On the other hand Dr. Wright had stated that a similar molecule of picraconitine combined with one of auric chloride. Taking these two points into consideration, Mr. Kingzett could not accept the formula given to picraconitine by Dr. Wright, and he was equally suspicious of those assigned to aconitine and pseudaconitine. To take Dr. Wright's own analytical numbers it would be seen that the carbon estimations were for the most part too high, while in as many instances the hydrogen figures were too low for the theories against which Dr. Wright compared them, and as these experiences in organic analysis were the reverse of those usually obtained, either the analytical numbers or Dr. Wright's theories must be rejected. Further, Dr. Wright did not give nitrogen determinations except in one case, while the number of carbon atoms in the molecule had been determined by a consideration either of the number of chlorine atoms, or of gold salts, which were not safe to deal with, as the gold might be either too high or too low. The chlorines could not be trusted because there might be half a dozen bodies in mixture, each of which might have the power of combining with one HCl. The only reliable factor, therefore, in determining the molecule of the base, was the relation of the nitrogen to the carbon, and this method Dr. Wright had not adopted, except in one instance. This had been done, however, by Dr. Paul and the speaker in the case of the base from Japanese aconite having the formula $C_{29}H_{43}NO_9$, and therefore there could be no doubt that it differed in its properties from anything described by Dr. Wright. As had been mentioned, in the mother liquor was found a substance that gave a precipitate on adding ammonia, and from this it was onjectured that it was a saline compound with an acid which formed an ammonium salt when the base was thus set free, and they had no doubt at all that this precipitated base was identical with the crystalline alkaloid already alluded to. With regard to Mr. Gerrard's view as to the extraction of the bicarbonate of sodium solution by ether, he remarked that by applying Sonnenschein's process to that solution, a third quantity of base was obtained, a platinum salt of which had been analysed, but the analysis was not completed, nor was the examination of the base generally completed, so that they had reserved further mention of it to a future opportunity.

Dr. WRIGHT was very glad to find that the Japanese alkaloids had been examined. The Committee appointed by the Conference to investigate this subject made several endeavours to obtain specimens of this root, but failed to do so; and he regretted that the authors of the second paper had not thought fit to mention what they were doing to the Committee, or perhaps they might have been saved from falling into one or two trifling errors. In the first place the description given of the alkaloid to which the C_{29} formula was given was quite sufficient to convince him that the body in question was simply the same as he had had in his hands dozens of times, viz., a mixture of pseudaconitine and the decomposition products thereof. The analytical numbers exactly agreed, and so did the physical characters; and he had on doubt that when Dr. Paul and Mr. Kingzett tried the experiment of fusing up some of the acid or resinous mother liquor with caustic potash at a temperature of about 250°, and then acidified, and extracted with ether, they would obtain protocatechuic acid formed from the dimethylprotocatechuic acid. If you started with perfectly pure pseudaconitine and crystallized it from alcohol you would get a mother liquor which only required acidifying and shaking up with ether to yield this body. The alkaloid which crystallized out was the pseudaconitine in a tolerable state of purity, although it partially decomposed even while drying. The gummy mother liquor that dried up to a resin was a mixture of the alkaloids themselves, viz., pseudaconitine and pseudaconine, and the dimethylprotocatechuates of each of these two bases, and, therefore, it was no wonder that on regenerating the akaloid from this resinous mass it was found to possess exactly the same properties as the substance which did crystallize from alcohol, namely, the same mixture of the same two bases. From the short time at his disposal he had not described a considerable number of experiments which really showed that exactly the same bodies were obtained as those described by Dr. Paul and Mr. Kingzett. The body which Mr. Gerrard described as being obtained from the mother liquor he had no doubt was pseudaconine, which was retained in solution much more readily in alkalies than pseudaconitine or aconitine. He should also mention that the aconine, the decomposition product of aconitine, was soluble in water and precipitated lead acetate so that it might be quite possible that the body experimented on by Dr. Paul might have contained aconitine itself in addition to the dimethylprotocatechuates. Mr. Kingzett had referred to the improbability of a body containing one and a half molecules of water of crystallization, but, as a matter of fact, a large number of such instances were known, and if that was the only difficulty it was very easy to double the formulæ as he had advocated in the case of other alkaloids. As regards the question why the nitrogen was not determined in order to get at the ratio between the carbon and the nitrogen, except in one or two instances, he regarded this determination as eminently more fallacious than any you could make in organic chemistry. You could get a fair approximation to the nitrogen, and an almost exact one of the carbon, but whichever method of determining the nitrogen you employed, there was a liability to so many errors that the question whether the ratio was one of nitrogen to thirty of carbon or one to thirty-one was impossible to decide by the soda lime or any other method. That was the result of many observations on the subject. In reply to Dr. Attfield's question, whether he thought a further grant might be usefully expended in solving some part of the pharmaceutical aspect of the question, he must say that in his opinion if the balance which remained in hand of the former grant were regranted, some results might accrue which might be sufficiently interesting to warrant the expenditure. At any rate he should like to complete the investigation in which he was associated with Mr. Groves and Mr. Williams, and even if no further grant were made, he proposed carrying it out as far as the materials he had in hand would permit. A question had been asked whether any observations had been made on the comparative activities of the different aconite roots and the alkaloids thence derived. If his memory served him some specimens of pseudaconitine and nearly pure aconitine, isolated some years ago by Mr. Groves, were examined by Dr. Fraser of Edinburgh, but he did not remember the precise character of the results, nor was he sure whether he was not confusing them with those obtained by a German chemist from the same two alkaloids; but it was found that whilst aconitine was consider-

* *Journal of the Chemical Society*, February, 1877.

ably more active than pseudaconitine with certain animals, such as rabbits, it was less energetic with others such as Guinea pigs, so that the physiological ratio of activity would be different according to the kind of animal experimented on, and very possibly might be different with different individuals of the human species. He had not been able hitherto to carry out any physiological experiments on these substances because he was waiting to get one or two other bodies in a state of perfect purity, and moreover he did not possess a vivisection licence. He hoped however that before the next Conference the physiological activity of all the specimens yet obtained would be carefully examined side by side, by Professor Michael Foster, of Cambridge, who was willing, he believed, to undertake this examination. With regard to the pharmaceutical aspect of the question, he did not think the preparations made direct from the root without the isolation of the alkaloids could be at all relied on. In the first place, in an alcoholic solution even the organic salts of the aconite alkaloids would undergo decomposition slowly on keeping, and therefore a preparation of a certain potency now would be weaker next year; and again, the roots met with in commerce were probably derived from different species grown in different climates and soils, and probably therefore contained different amounts of active alkaloids, so that a preparation made in one case with a certain weight of one class of root would differ from one made from the same weight of another class. If, however, the alkaloids were extracted to a certain degree of purity, say fifty per cent., you could always depend on having an agent of the same physiological potency.

Mr. Kingzett said the discussion of course could not go on indefinitely, but he should like to make one or two remarks on what had fallen from Dr. Wright. In the first place it was generally accepted by chemists that the method of Dumas was an exact method for determining nitrogen; the error being generally on the side of excess to a slight degree, but when corrected in the ordinary way the error was reduced practically to nothing; whilst by the soda lime method you were liable to get a very large error indeed, and it was by this method that Dr. Wright had made his solitary nitrogen estimation It had been shown by Dr. Thudichum and Mr. Wanklyn, and more recently by Dr. Thudichum and himself, that the methods he had mentioned were exact; he (Mr. Kingzett) had made more than 500 analyses, in which correct nitrogens determinations had been so effected. Dr. Wright imagined that the alkaloid they had obtained was his pseudaconitine mixed with what he supposed to be the aconitine decomposition product, but there was not the least evidence for such a statement, as he should now show. There might be in different species of aconite root, different alkaloids, but that the alkaloid obtained from Japanese aconite was identical with any of the alkaloids described by Dr. Wright was perfectly inadmissible. Dr. Wright had stated that while hydrochloric acid and certain other reagents split up these alkaloids into certain decomposition products, tartaric acid was free from this objection, yet, nevertheless it was by a method employing hydrochloric acid that Dr. Wright had obtained his pseudaconitine! On the other hand, Dr. Paul and he had used tartaric acid and therefore on Dr. Wright's own showing, the Japanese alkaloid could not have been at least a mixture of pseudaconitine with aconitine decomposition products. Not only so, but their alkaloid with the formula $C_{29}H_{43}NO_9$ did not split up as stated by Dr. Wright to be true of his substances either into benzoic or dimethylprotocatechuic acid and secondary bases, so that all this theory as applied to their alkaloid was the merest imagination. They had noticed that both the French and English commercial aconitines as well as that which they had prepared from Japanese aconite, when boiled with dilute sulphuric acid (a 2 per cent. solution), yielded a solution which would reduce Fehling's copper test, and in that respect it resembled sugar, but he was not prepared to accept that circumstance as a proof that it was dimethylprotocatechuic acid, especially on the evidence contained in Dr. Wright's paper. He should also remark that the alkaloid from the German aconite failed to give this reaction when boiled with dilute acid. Lastly he should like to ask Dr. Wright what were the physical characters of the acid obtained by splitting up in the way he described, of aconitine by dilute acids, alcohol, and so on.

Dr. Wright said the physical characters of benzoic acid were pretty well known; the melting point was 120·5; it was slightly volatile, and it yielded various characteristic reactions. The other acid was somewhat analogous in its properties; it was extracted from an aqueous solution by ether, almost entirely by one extraction—perfectly by three; the ethereal solution left by evaporation a residue which could be crystallized from boiling water, the substance being nearly insoluble in cold water. He had tested it side by side with synthetically prepared dimethylprotocatechuic acid, and found they were identical. The neutral salts of each of these acids gave with a moderately strong solution of nitrate of silver, a peculiar gelatinous precipitate, and there were several other qualitative tests in which the two bodies absolutely agreed.

Dr. Paul said it would be unreasonable to detain the meeting with the discussion of a subject which was unfortunately in a very incomplete and inchoate condition, but he should like to say just a word or two. The fact that the examination of the alkaloid from the Japanese aconite had been undertaken by himself and Mr. Kingzett had incidentally brought them in contact with the subject on which the report had been read. Having obtained the alkaloid and examined the substance to some extent, they supposed, after the amount of elaborate investigation and reporting which had gone forward for some time—they had merely to do as a botanist did with some questionable plant—compare it with one in his herbarium—and that then they would be able to say whether it was picraconitine, pseudaconitine, or something else described in those reports. But when they came to apply this procedure to the substance in question they found themselves in such a fog that they were unable to say whether it was this, that, or the other, and in pursuing their way through this misty region they found only statements unsupported by any adequate evidence, and chemical formulæ that had no legs to stand upon; they had therefore to try and find some light for themselves. Just at the end of their journey they lit upon a fact which seemed to throw some light on the muddle and diversity of opinion which had prevailed with regard to the chemistry of aconitine. There was this much certain, that there had been a great variety and antagonism of opinion on the subject, and they all knew that aconitine varied very much. Makers would recommend their preparation as being more active than some one else's, and it was also agreed on all hands that the alkaloid obtained from aconite contained a crystallizable substance mixed with a gummy uncrystallizable substance. This agreed with the result of their examination of Japanese aconitine, and the samples of aconitine they had dealt with also contained an uncrystallizable substance, which together with the crystallizable portion was soluble in ether. A further examination showed that this gummy substance when treated with ammonia—not with strong alkalies, which they had avoided, having respect to the tradition that aconitine was a very evanescent substance—yielded an alkaloid identical with the crystallizable body in all its characters which they were able to test it by. The conclusion, therefore, at which they arrived was, that they doubted whether the alkaloid to which the active properties of aconite root are ascribed had ever yet been obtained in a separate state. In fact, it seemed probable that the substance extracted from aconite was to a great extent a salt of an acid like aconitic acid. In regard to the formulæ of the decomposition products which had been spoken of, he thought before they could say much about them they must determine clearly the nature of the substance from which they are supposed to be derived, whether it was really an alkaloid or whether it was a mixture of several accidental combinations of an alkaloid with some acid which might probably be aconitic acid, for that acid was certainly present in aconite, and since it was soluble in ether it would, therefore, certainly be got out by Duquesnel's process together with the alkaloid. With regard to the strength of the pharmaceutical preparations made from aconites he would also remark that in the absence of more definite chemical knowledge of the active principle in aconites it was quite an accident what amount of potency these preparations would possess. The statements given as to the percentage of aconitine in aconite varied from ·03 to ·07, but they had obtained from Japanese aconite as much as ·20. Considering the powerful action of aconite it seemed desirable to have some means of determining the amount of active principle.

A vote of thanks having been passed to the authors of the papers the Conference adjourned for luncheon which was provided by the Local Committee in the Mechanics' Institute.

(*To be continued.*)

Dispensing Memoranda.

We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be conidered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.

[20]. In answer to "Ph. Chemist," aq. caryophylli, and aq. cinnamomi as well, when recently distilled, make an opaque mixture, more or less dense, according to age of water.

PRACTICE.

[21]. AVOIRDUPOIS OR APOTHECARIES?—According to the British Pharmacopœia "Difficultas" should use avoirdupois weight. It would make matters perfectly distinct if prescribers wrote ℥j troy, or gr. 480.

PRACTICE.

[22]. KEEPING LEECHES.—I have kept leeches about sixteen years and usually have from thirty to eighty in stock, and do not think my loss has averaged three a month during the time. My plan is to keep them in a two-gallon round glass aquarium with a perforated zinc top, to have about two quarts of water in it and a few pebbles, sometimes a piece of valisneria, but not always, as I have not found it to be absolutely necessary. I use water supplied from our waterworks, such as we have for drinking purposes, and have it changed say in warm weather once in ten days, and in colder weather once in three weeks, which is often enough.

This aquarium is kept in a store room, on a shelf which is neither very dark nor very light. I prefer *larger* spotted leeches and do not find any difficulty in keeping them healthy. I have often read of the losses others have had, and perhaps twice during the sixteen years I have had in a stock of fifty and lost a third of them in a week, but with a little extra care I have saved the remainder and had no further difficulty.

I have known them to breed in a glass aquarium and also in a fountain basin in my garden, and there they thrived with fish and water plants uncommonly well; they will, however, not do with fish in a *small* space, because the leeches fasten on the fish and exercise their peculiar function of blood-suckers, but where there is plenty of room the fish are not so much attacked by them.

I think Mr. Hoddinott will find the following hints useful, and I shall be happy to give him any further information that I am able by post:—

1. Have healthy leeches and a clean glass aquarium to start with.
2. Use drinking water as pure as can be obtained.
3. Keep the aquarium where it can easily be seen when the water is cloudy.
4. Be careful that clean hands are always used when touching or changing the stock.
5. Do not change the water too frequently.

ALFRED WILLIAM SMITH.

[22]. KEEPING LEECHES.—In keeping leeches healthy I have found the following plan invariably to succeed:—Keep the stock as low as possible; *never change the water unless it is absolutely necessary*, and, in cleaning, avoid as much as possible touching, or disturbing them with the hands. If the water is discoloured (providing it is not with blood), there is not the slightest necessity for a change as, often enough, such discoloration occurs immediately after cleaning. When the water begins to get turbid and to smell slightly, which happens in from four or five days to a month according to the season, it should be changed as gradually as possible, always remembering that the temperature of the water in your jar differs from that in the cistern or reservoir, and that a direct change from one to the other is prejudicial to the health of your stock. Put the jar under the tap and let a small stream run, after a while it will become clean, often without the slightest disturbance to its inmates. In large aquariums it would be a source of constant fatality to introduce an instant change of water, at a different temperature and, as a matter of fact, it is never attempted—the same body of water being used over and over again—oxygen being supplied by means of air forced in at different stages of its transit from tank to tank. The same broad rule is, I believe, applicable even to a leech jar.

CHARLES B. ALLEN.

[22]. KEEPING LEECHES.—I see from the *Pharmaceutical Journal* a correspondent wishes to know the best way to preserve leeches; the undermentioned I have found a first-class way, viz., keep in common tap water with pebbles in the glass, also put a piece of metallic iron in, say the size of a walnut. I have had to do with leeches for years, and since I tried the above, that will be over twelve months since, I have not had one dead.

A REGISTERED STUDENT OF THE SOCIETY.

P.S.—The water only to be changed weekly.

[22]. KEEPING LEECHES.—F. F. Hoddinott should try *river* water for his leeches, it must not be changed too often—about once in six weeks is quite enough. The water at first undergoes a kind of fermentation, but afterwards becomes quite clear and the leeches thrive in it.

FREDERICK W. E. SHRIVELL.

[22]. KEEPING LEECHES.—If leeches die rapidly and

constantly the best plan is to obtain a fresh supply from a different house to the one previously used; place them in a separate vessel from those already in stock. If an aquarium and gravel be employed with which diseased leeches have been in contact, the aquarium should be well washed with hot water, and the gravel, etc., with boiling water. Ordinary water, changed once a fortnight, and plenty of light keep leeches healthy.

PRACTICE.

[22]. KEEPING LEECHES.—Some year or two ago I drew attention to a method of keeping leeches, which in my hands far surpassed any plan I had seen or practised. I have little or no mortality and a minimum of trouble; I put the leeches into strained rain water, in a glass receptacle, with some bits of iron (a chain is a very good thing), and stand it in a moderately lighted place with a good circulation of air. Frequently it is not moved for six weeks or more, and once the water had so diminished by evaporation that it was only one-fourth the proper quantity, nevertheless the leeches were vigorous and healthy.

HIRUDO.

Obituary.

H. A. WEDDELL, M.D.

A paragraph from a letter, quoted in the *Pharmaceutische Zeitung* conveys the intelligence of the death of the distinguished quinologist, Dr. H. A. Weddell, which took place at Poitiers, on the 22nd of July.

Dr. Weddell was born in 1819, and therefore at the time of his death he was in his fifty-eighth year. He was the author of numerous memoirs on botanical subjects, including papers on ipecacuanha, caoutchouc, etc. But his best known and most valued work has been done in connection with the Cinchonas. In 1843, with M. de Castelnau, he was commissioned by the French Government to travel through the inland provinces of Brazil and Peru. Up to that time Bolivia had not been explored for cinchonas, the search for the officinal species having been confined to New Granada, Ecuador, and Peru, so that nothing had been done in a country known to produce a bark extremely rich in quinine. But after about two years Dr. Weddell separated from his companion and, traversing this region, penetrated into the Peruvian province of Caravaya, and reascending the Andes to Cuzco reached the limit of former explorations, reaping on the way a rich quinological harvest. As one result of this journey he published, after his return to Europe in 1848, his '*Histoire Naturelle des Quinquinas*' (Paris, 1849). In this fine folio work, illustrated by thirty-four plates, eight new species of Cinchonæ were described, and a systematic arrangement of all the known species was given. It exercised considerable influence on the classification of the Cinchonas, and was an important contribution to quinological science, in fact the only one based on original observation published for a long interval.

The gradual accumulation of numerous data respecting the botanical and chemical characteristics of the Cinchonas, induced Dr. Weddell in 1870 to publish his '*Notes sur les Quinquinas*,' which first appeared in the *Annales des Sciences Naturelles*. Agreeing with Mutis that the large number of forms composing the genus *Cinchona*, which are so closely interlinked with each other and show a constant tendency to increase, are possibly the result of the development and variation of a small number of primitive forms, Dr. Weddell in this work distributed them all into five groups, at the head of each of which is a typical form or "*stirps*." The types adopted are *C. officinalis*, *C. rugosa*, *C. micrantha*, *C. Calisaya*, and *C. ovata*. The value of this work was immediately recognized, and the Indian Government at once had it translated into English for circulation in India. It was also translated into German by Professor Flückiger. Only recently Dr. Weddell took a leading part in a Cinchona Congress and Exhibition held at Amsterdam.

Notice has been received of the deaths of the following:—

On the 24th of July, 1877, Mr. William Clark, Pharmaceutical Chemist, Landport. Aged 69 years. Mr. Clark had been a member of the Pharmaceutical Society since 1870.

On the 31st of July, 1877, Mr. William Chenhalls Hemmings, Chemist and Druggist, Penzance. Aged 62 years.

On the 10th of August, 1877, Mr. Thomas Lundie, Chemist and Druggist, Great Grimsby. Aged 40 years.

On the 13th of August, 1877, Mr. William Hope, Chemist and Druggist, Uppingham. Aged 77 years.

On the 14th of August, 1877, Mr. Henry Hunter, Chemist and Druggist, Alnwick. Aged 65 years.

On the 18th of August, 1877, Mr. John Colby, Pharmaceutical Chemist, Weston Road, Brighton. Aged 35 years. Mr. Colby had been a member of the Pharmaceutical Society since 1865.

On the 20th of August, 1877, Mr. Edwin Foy, Chemist and Druggist, York Town, Farnborough Station. Aged 40 years.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

"CASTOR OIL PILLS."

Sir,—I have perused with much interest the account of the "castor oil pill" case, reported in a recent issue. In my capacity of assistant it has frequently fallen to my lot to be pestered for these pills. My impression is that most of the persons using "castor oil pills," so far as they give the matter thought, are firmly convinced of their identity with castor oil, and if an assistant were so unwise as to attempt to upset their belief, the would-be buyers of "castor oil pills" would leave the shop either without purchasing at all or thoroughly dissatisfied with what was supplied them, resolved in future to patronize an establishment where less ignorance (for such they would designate it) and certainly more business tact was displayed. The proprietor of a business might take a turn at playing the schoolmaster if it so pleased him, but I fancy the luxurious delights of an educator would cease to charm the most scrupulous of men, when he discovered that even this amusement had to be paid for by loss of business. Practised by an assistant the educational process would generally involve censure from the master for unbusiness-like behaviour, and a few repetitions of the offence would very like mean the loss of the situation, leaving the assistant to regret that he made not friends of the mammon of unrighteousness. I presume a man's object in selling drugs is to make money, and as druggists are not subsidized by the State it seems no part of their duty to fill gratuitously the office of teachers to their customers, especially in matters which for their complete apprehension require the smallest possible exercise of common sense. The most practicable method of surmounting this difficulty would be to use a label for "castor oil pill" conceived something after this manner, "Mild aperient, hitherto known as castor oil pills." But I gather from the report of the trial that this method would require to be carried to an absurd extent, in fact throughout the complete catalogue of misnomers, if one would satisfy the stern inflexibity of the law; besides, such labels are practically useless, as the public seldom or never trouble to read them, or if they do are no wiser, not even in their own conceit. I imagine that those engaged in the drug trade do not pretend to be more scrupulously honourable than other tradesmen, but when so much dirt is thrown, some will stick, and it behoves us to avoid even the appearance of evil, by adopting such precautions as will keep us out of the meshes of the law, lest we earn, like the proverbial dog, a bad name, to the detriment of the best interests of an honourable occupation.

JUVENIS.

Sir,—The prosecution for the sale of "castor oil pills," I have no doubt, will seem quite as absurd to the intelligent public as it is to chemists, it being well known that "castor oil pills" are merely pills that may be taken with safety, instead of castor oil, at a time when strong purgative medicines would be injurious. However, as it is a fact that a chemist has been fined for selling them, it behoves anyone who can suggest a remedy for this and other like cases, to give others the benefit of it. I therefore enclose you a label which I have used for the last few years, and I think should "castor oil pills" be asked for, they might safely be sent out with a label of this description. The label reads as follows:—"Mild Aperient Vegetable Pills, 1 or 2 at bed-time occasionally. As these Pills are often taken instead of Castor Oil, they are sometimes called Castor Oil Pills."

A. W. GARDNER.

Canterbury August, 13, 1877.

PHARMACY IN THE CHANNEL ISLANDS.

Sir,—Your correspondent from the Isle of Man, in his letter of August 11th, appears to be ignorant of the fact that the Channel Islands still suffer from the same want of pharmaceutical legislation, and that the public remain unprotected from the consequences of the business being thrown open to ignorant and unscrupulous men, and the chemists find themselves exposed to ruinous competition from the same class. Looking at the long and intimate legal relations existing between the Islands and France, one would have expected to have found a system of pharmaceutical laws somewhat similar here, or that measures had been taken for the extension of the English Pharmacy Act. Evidently the oriental apathy complained of by your Manx correspondent is not confined to his Island, as it exists in the same degree here. In this case it is extraordinary, as the Members of the Society are in majority here, and one would imagine that they would be only too anxious to free themselves from unqualified competition which they have had to contend with, not only from England, but France as well. I believe that if steps were taken in a proper manner to bring this under the notice of the States of the Island, that they would at once sanction the adoption of the Pharmacy Act, and thus remove a state of things which is not in accordance with the present age of progress. Perhaps the Manx initiative in ventilating this question may produce some effect here, and induce the chemists to unite together for the purpose of furthering so desirable an object.

Jersey, August 13. A JERSEY CHEMIST.

PHARMACY IN THE ISLE OF MAN.

Sir,—I heartily agree with "H. S. F." with regard to the necessity for a decided improvement in the *status* of pharmacy as it effects the interests of the Manx people. It is indeed a wonder that no one has broached the subject before, but now that the urgency of the case has been so well set forth, and the remedy indicated by your correspondent, I hope prompt action will be taken by the proper authorities to introduce such measures as will benefit the community immediately concerned without detracting from the liberties of other British subjects, or depriving them of rightful privileges.

Whilst the chemists of Great Britain and its sister isle "Hibernia" have got legislative enactments to protect them from the inroad of strangers—however great their pretensions—the populous little island in question has been left out in the cold; yet I trust it may soon be on the same footing as its neighbours, and show the truism of its crest, so that if it cannot share the immunities or restrictions of the shielded parties, it may claim its independence in this matter and prove a successful rival; nay, more! far outvie us in its endeavours to advance pharmacy to that honourable position we so strive to maintain.

The Irish Act was a great mistake, in so far as the title of "Ph. C." is obtainable under its cloak by passing an examination, which, in comparison with the severe test put upon candidates for the "Major" by the Board of Examiners in this country, is a complete farce.

If there is any cause for the repeal of the Pharmacy Act of 1868, it might be well to consider the desirability of amalgamating the whole body of pharmaceutists in the United Kingdom under the general name of "The Pharmaceutical Society of the British Isles," or perhaps the more elegant one of the "British Pharmaceutical Society," which might easily become the younger sister of the "British Medical Association;" just as the British Association and the British Pharmaceutical Conference now work in harmony and their hold meetings together. In the event of such an alliance, of course the compulsory examinations conducted in the respective centres would need to be on a par as regards requirements and stringency—not making "fish of one, and flesh of another," as is the case at present, while two distinct acts exist.

In the meantime, steps should be taken to prevent the pleasant spot and resort of tourists in the Irish Sea from being overrun by ambitious invaders who can display their "colours."

I think there certainly ought to be reciprocity of feeling between the various boards in the Queen's dominions whereby the same qualification would hold good at home or in the colonies, and freedom given to any one holding a diploma of registration to start where he chooses on payment of the requisite fee without being subject to a second ordeal, in the same way as certificates from College of Surgeons or University classical examinations are accepted now in lieu of the pharmaceutical Preliminary.

JAMES B. L. MACKAY.

Newcastle-on-Tyne, August 13, 1877.

"*Devonian.*"—(1) The right of a person who has passed the Minor examination to registration as a "chemist and druggist" is not forfeited by his becoming subsequently registered under the Medical Act. (2) Yes.

A. P. A.—According to section 3 of the Act to Amend the Pharmacy Act, 1868, passed in 1869, nothing contained in section 17 of the first mentioned Act (relating to the labelling and registration of scheduled poisons) is to "apply to any medicine supplied by a legally qualified medical practitioner to his patient or dispensed by any person registered under the said Act, provided such medicine be distinctly labelled with the name and address of the seller, and the ingredients thereof be entered, with the name of the person to whom it is sold or delivered, in a book to be kept by the seller for that purpose."

J. D. Adcock.—We do not quite understand your communication.

J. Brend.—We do not think it could be done legally without a licence. Write to the Solicitor to the Inland Revenue Commissioners, Somerset House.

F. J. Fox.—(1) *Linaria minor*; (2) *Matricaria inodora*; (3) *Amaranthus reflexus*; (4) *Galium Mollugo*; (5) Too fragmentary to determine; (6) *Orchis maculata.*

"*Syrupus.*"—(1) *Tortula muralis*; (2) *Tortula fallax*, mixed with *T. muralis.*

"*Student.*"—The first fifteen sections of the Pharmacy Act, 1868, relating to the registration of chemists and druggists, do not extend to "the business of wholesale dealers in supplying poisons in the ordinary course of wholesale dealing."

T. H. Fletcher.—Yellow prussiate of potash is not a poison; but bichromate of potash is. Although the latter is not included in the schedule of poisons it would be safer to label it "poison."

J. B.—Apply to the Secretary for a copy of the pamphlet 'Hints to Apprentices and Students.'

G. S.—(1) *Senecio aquaticus*; (2) *Lysimachia nummularia*; (3) *Lythrum Salicaria*; (4) *Circæa lutetiana*; (5) *Galium uliginosum.*

J. W. Wood.—*Hyoscyamus niger*.

J. G.—Yes.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Boothby, Mr. Rowcroft, Mr. Slade, Mr. Gilmour, Mr. Holland, Mr. Brown, Mr. Smith, Mr. Slade, Hirudines, Merens, W.H.S., J.W., M.

THE TINCTORIAL POWER OF SOME PHARMACOPŒIA PREPARATIONS.

BY W. GILMOUR.

Is colour as a rule to be depended upon as indicative of the strength and quality of pharmaceutical preparations? If we were to answer this question in the light of universal custom we should undoubtedly answer in the affirmative, but if we were to judge solely by the absence of all rule and standard we should as unhesitatingly answer in the negative. Nothing is more common, or seems more natural, than to examine the degree of whiteness, say, of a powder, or the depth of colour of a tincture or an infusion. Indeed, this generally forms in common with taste and smell a very important part of the preliminary examination to which all drugs are admittedly subjected, and the absence of any rule or standard, it need scarcely be pointed out, neither invalidates the custom nor the conclusion arrived at.

Still in view of the very deceptive nature of colour (and especially half tones) to different eyesight, as also the artificial manner in which many drugs are manipulated so as to be in many cases in this respect beyond the power of detection by ordinary examination, the following experiments in colorimetry may not be uninteresting. The plan pursued was to estimate the amount of light transmitted through a known strength of solution and reduce it to degrees for purposes of comparison, etc. This is most readily accomplished by a simple adaptation of the spectroscope in which the spider web micrometer is brought to the exact point of complete absorption of the light when the amount transmitted can easily be calculated. Take for example ordinary tincture of iodine, which contains about 10·9 grains iodine to the ounce, place it in a graduated burette, and estimating the total amount of light transmitted at 20°, we find that for each single degree of light passing through beyond that amount there will require to be a reduction of iodine in the solution to the extent of a grain and a fraction to the ounce in uniform proportion, thus—

10·9 grains iodine in 1 oz.	= 20° transmitted light.			
9·5	,,	,,	= 21°	,, ,,
8·2	,,	,,	= 22°	,, ,,
6·8	,,	,,	= 23°	,, ,,

The ratio here is nearly uniform, but if instead of the tincture we take an aqueous solution, say the volumetric solution which contains about 5·5 grains to the ounce, we shall find that instead of continuing uniform as above, and which would indicate about 24°, it immediately leaps to 31°, whilst the reduction of iodine in the aqueous solution by a grain and a fraction as in the previous instance raises it to 36°. Thus—

5·5 grains iodine in 1 oz. aqueous solution = 31°
4·1 ,, ,, ,, ,, = 36°

From which, as well as from other experiments not thought necessary to note, we have brought out the interesting facts, namely, that an aqueous solution has not the same tinctorial power as an alcoholic of the same strength, and that very dilute solutions raise the amount of transmitted light in unequal increments.

Not less interesting was the experiment with two different samples of tincture of opium, the one tincture made from a good sample of opium, the other from what is known as a good second. In bulk, the appearance of the two tinctures was not unlike, although on closer examination in smaller volume, that made from the second opium was not quite so deep in colour. Still, from a general examination, it might have passed for ordinary tincture of opium, B. P., and certainly no one could have been prepared for the extraordinary difference in the amount of transmitted light on comparing the two. Thus—

Tincture opium 1st . = 48° transmitted light.
,, ,, 2nd . = 60° ,, ,,

The difference was fully explained on further examination by the first yielding on evaporation 5·0 per cent. dry extract, whilst the second only yielded 3·1 per cent.

Taking the first tincture again and diluting it gradually the same uniform results were obtained as in the case of the iodine, with this difference, namely, that the amount of light transmitted increased in greater ratio than the dilution, thus—

Tincture opium	full strength	= 48°	transmitted light.
,, ,,	diluted 12·5 p. c.	= 51°	,, ,,
,, ,,	,, 25·0 p. c.	= 56°	,, ,,
,, ,,	,, 37·5 p. c.	= 62°	,, ,,

This last dilution, it will be noticed, corresponds very closely not only with the amount of transmitted light but in strength also with the second tincture, and the coincidence here is more than singular and points to conclusions which further experiments seem amply to confirm. We may take another opportunity of referring to these, but in the meantime we would point out that these preparations were chosen for a preliminary investigation, not from any thought that a better plan of determining their absolute strength could be substituted for those already known, but simply because they were of such a nature that their strength could otherwise be correctly determined and thus compared colorimetrically. But apart from this, both preparations and especially tincture of iodine, admit of considerable variation of strength without being apparent to the eye, and therefore they afford a good indication of the delicacy of the test. If any one doubt this let him take tincture of iodine and dilute in various proportions even to a considerable extent, and then compare the different degrees of strength. He will probably be astonished to find how very gross the adulteration requires to be ere it can be detected by the unaided eye.

NOTE ON RHEUM OFFICINALE (BAILL.).

BY E. M. HOLMES, F.L.S.,

Curator of the Museum of the Pharmaceutical Society.

In some remarks made upon *Rheum officinale* a few weeks ago (vol. viii., p. 1017), the hope was expressed that a further opportunity of examining the root might clear up the doubts as to the identity in structure of the true Russian rhubarb and the root of *Rheum officinale*. During the past week Mr. Usher, of Banbury, has kindly afforded me this opportunity.

A plant three years old was dug up, and presented the following features:—

The sympodium or cluster of rootstocks differs from that of *Rheum rhaponticum* in its great size, and in the root forming a tuft at the base of the rootstocks, and not springing from their sides. When the rootstocks were trimmed by depriving them of the roots and small lateral shoots, they weighed on the average about 8¾lbs., the central one being about 10lbs. The rootstocks were nearly cylindrical in shape, tapering very slightly to either end, and about 6 inches in diameter in the middle, and from 15 to 18 inches long. The roots on the average were 1½ to 2 inches in diameter near their attachment to the rootstock, and tapering downwards. The rootstocks of some *Rheum rhaponticum* of eleven years' growth, which was lying near, were not more than a quarter the size.

When the outer portion was carefully sliced off in different parts of the rootstock and root, it *nowhere* presented the appearance characteristic of the true Russian rhubarb. The cortical portion was then removed in several places (this being always absent in Russian rhubarb), and the meditullium or central portion sliced in like manner, but no trace of the network which so markedly distinguishes the Russian rhubarb could be seen. These marks are well represented in *Goebel and Kunze*, pt. II., tab. 1, fig. 2 *b*.

The transverse section of the rootstock also is not so finely grained, and although it is marked with many stellate spots, the markings are much larger and bolder than those of Russian rhubarb, and, in fact, approach more nearly to the markings on English rhubarb. The sections of the true roots present only a radiate structure without any stellate markings. In my opinion, the Russian root is produced by a plant which has a much less rapid growth than the noble *Rheum officinale*, Baill.

From the English rhubarb the rootstock differs chiefly in its paler colour, much larger size, and in the abundance of large stellate markings. As regards its medicinal properties there is reason to believe that it is much stronger than the English kind, and probably equal to the East Indian. It will most likely be soon tried at two of the London Hospitals, and a report upon its action will doubtless follow in due course and awaken considerable interest.

PHYSIOLOGICAL ACTION OF PAO-PEREIRA.*

Geissospermum læve, Baillon.

BY MM. BOCHEFONTAINE AND DE FREITAS.

The pao-pereira tree is a nature of Brazil, and its bark has been much used by the physicians of that country since Professor Silva, about the year 1830, made known its febrifuge and antiperiodic properties. It belongs to the Apocynaceæ, and has been variously designated as *Picramnia ciliata*, *Vallesia punctata*, *Tabernæmontana lævis*, and *Geissospermum Vellosii*. Professor Baillon is, however, of opinion, after a recent examination of leaves and stems received from Brazil, that it should bear the name of *Geissospermum læve*.

The bark of this plant contains an alkaloid in great abundance; this was first extracted in 1838 by Santos, and called by him "pereirine," but the authors propose to change this name to "geissospermine," after the generic name of the plant.

The dried leaves at the disposal of the authors had an extremely bitter taste, analogous to that of *Quassia amara*, which became manifest after chewing them for a few seconds. This taste being similar to that of the stem bark suggested the presence of a certain proportion of alkaloid in the leaves. Some leaves were therefore macerated in dilute alcohol and from the liquor thus obtained an alkaloidal precipitate was obtained, as was a similar one also from an aqueous maceration of bruised leaves. It seems therefore that the leaves contain the alkaloid, though in less quantity than the bark, and this is confirmed by the physiological action of the aqueous extract of the leaves on frogs.

The alkaloid of *Geissospermum*, as employed in Brazil is not a chemically pure product; it occurs under the form of a brownish-yellow amorphous powder, the bitterness of which resembles that of the leaves and the bark. Although daily employed in Brazil for many years past the physiological action of neither the alkaloid nor the bark appears to have been studied experimentally. The authors therefore took up the investigation, using geissospermine dissolved in water or alcohol, and alcoholic and aqueous extracts of the powdered bark.

The experiments showed that geissospermine is a toxic substance, exercising no local irritant action when administered subcutaneously. Two milligrams introduced under the skin caused the death of a frog; paralysis was produced by half a milligram. A full-grown guinea-pig was killed by one centigram, and fourteen centigrams completely paralysed a small dog. The symptoms were a slackening of the cardiac beats, and of the respiratory movements. The voluntary movements were first paralysed, the reflex movements gradually ceasing subsequently. The sensitive nerves appeared to preserve their functions as long as the motor nerves. The muscular contractility was not affected. The authors therefore consider geissospermine to be a poison which acts by destroying the physiological properties of the central nervous grey matter.

* Abstract of paper in *Comptes Rendus*, vol. lxxxv., p. 412.

THE PRESENCE OF TANNIN IN GENTIAN ROOT.

Is will be remembered that in a paper read before the Philadelphia College of Pharmacy in the early part of last year,* Professor Maisch vigorously combatted an assertion just previously made by Mr. Patch, that tannin is present in gentian root, and alleged that in commenting upon an incompatibility between tincture of chloride of iron and compound tincture of gentian Mr. Patch had overlooked the presence of orange peel in the latter tincture. The dispute led Mr. Ville, of the Montpellier School of Pharmacy, to undertake a series of experiments under the advice of Professor Leon Soubeiran.

The experiments were made with *Gentiana Burseri*, which, with *G. lutea*, is found in great abundance in the Pyrenees. The author states that cold macerations of these gentians gave positive indications of the presence of tannin with perchloride of iron, albumen, and gelatine. A small piece of fresh calf's-skin, placed in a concentrated infusion, also presented very apparent indications of tanning in a month after the commencement of the experiment.

In seeking to ascertain to which of the constituents of gentian this property was due the author found that in decolorizing a maceration of gentian with animal charcoal the bitterness was removed at the same time, and also that the colourless liquid then became indifferent towards the above-mentioned reagents. This seemed to warrant the supposition that the tanning principle was constituted either by the colouring principle (gentianin) or by the bitter principle (gentiopicrin). These principles were therefore isolated and tested with the reagents when it was found that the bitter principle, gentiopicrin, gave negative results, but that the colouring principle, gentianin, gave reactions of considerable intensity. The author therefore considers the tanning nature of gentianin to be demonstrated. He considers that there exists considerable analogy in their chemical functions between this colouring matter of gentian and the colouring matters of rhatany and yellow wood. It is proposed that in consideration of these properties "gentianin" should henceforth be called "gentianotannic acid."

* See *Pharm. Journ.* [3], vol. vi., p. 775.

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 8, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE ILLEGAL SALE OF POISONS AS PATENT MEDICINES.

SINCE the Pharmacy Act was passed in 1868, neither it nor those who have been entrusted with the carrying of it out have at any time lacked criticism, and this has too frequently been uttered in entire forgetfulness of the circumstances under which that Act became the law of the country. It needs but to consult the reports of the debates whilst the Bill was passing through Parliament to find that it was only out of regard to the safety of the public that the limited restriction at present existing in regard to the sale and dispensing of medicines was established. At the same time consideration of what was supposed to be requisite for the public convenience had even then an important modifying influence upon the regulations which operated as a protection to qualified chemists and druggists. One very fertile source of complaint has been that portion of the sixteenth section of the Act which excludes the making or dealing in so-called patent medicines from the operation of the previous sections providing that only registered chemists and druggists shall deal in preparations containing any of the scheduled poisons. Whilst on the one hand it has been complained by chemists and druggists that the government stamp has been used to cover an extensive evasion of the spirit of the Act; on the other hand the medical press has not hesitated to blame the Council of the Pharmaceutical Society for not exercising powers in respect to the sale of proprietary preparations containing poison that have yet to be conferred upon it by Parliament.

It will therefore be noticed with satisfaction that the short report of the proceedings of the Council on Wednesday last mentions a salutary check that has been given to a growing tendency to overstep the encroachments which the exception as to "patent medicines" has hitherto favoured. The case relates to the sale by a Mr. THOMAS P. ALLATT, of Hacconby, Bourne, who is not a registered chemist and druggist, of an article bearing a patent medicine stamp, and labelled, "Smith's Black Sedative Drops, commonly known as Laudanum (Poison)," together with the name of Messrs. STURTON of Peterborough as the wholesale agents. The sale of laudanum by grocers and village hucksters, under such fancy names as "sedative drops," "infants' mixture," and the like, is unfortunately no novelty, though probably the recent development of public opinion on this question will soon allow of a more vigorous policy being adopted towards this class of offenders against the spirit of the Act. But the subterfuge of simply giving the second place to the real name of the drug was too transparent and audacious to be tolerated, and the Society's Solicitor was instructed to take proceedings against Mr. ALLATT for a breach of the Pharmacy Act.

We understand that the proceedings at once drew from Mr. ALLATT a disclaimer of any intention of breaking the law, of which he professed ignorance, and a statement that he had trusted in the matter to the judgment of the wholesale agents who supplied him with the "sedative drops." Messrs. STURTON also on their part accepted this position, but alleged that they were unaware until then that the course adopted by them was illegal. Of course these gentlemen are entitled to the full value of such a reclamation, but, nevertheless, we think that the action of the Solicitor, in accordance with the maxim *ignorantia juris neminem excusat*, will react beneficially, and that possibly the enforcement of the penalty in this case will help materially to dispel fortuitous oblivion still existing in some quarters, and quicken the perception of other dealers in these questionable articles as to their position in respect to the law of the land.

But notwithstanding that this result will be acknowledged generally to be satisfactory as far as it goes, it must be admitted that the entire law relating to the sale of so-called patent medicines is in an anomalous condition. We will not now do more than allude to the want of a clear definition of what constitutes a patent medicine, a want that has led the Inland Revenue authorities themselves into conflicting decisions, and is at the present time the source of expensive litigation in the Appeal Court. Neither will we raise the question as to the factitious value which the use of a government stamp may or may not give these preparations in the eyes of the credulous. Probably the Chancellor of the Exchequer would find many people to agree with him that this is not an unmitigated evil, and that it is not unusual to make the foibles of the people contribute towards the increase of the national revenue. But we apprehend that there would be few disinterested persons found to defend the consistency—or inconsistency— of a law which, for the safety of the public, provides that under their proper names even the smallest quantities of certain poisons shall be sold only by specially trained persons and in accordance with strictly specified conditions, whilst it allows any quantity of them, if under fancy names and covered by a stamp, to be sold unrestrictedly by any person able to pay five shillings annually for a licence.

At the time of the passing of the Pharmacy Act, 1868, this question was hardly ripe for dealing with, but there has been during the last two or three years a considerable expression of public opinion that the dealing in all preparations containing poisons should be restricted to properly qualified persons. Whether this can be brought about without interfering too much with the convenience of the public, or with the vested interests of the patent medicine proprietors, is a problem well worth study, and certainly it does not lie beyond the domain of the pharmacist.

POISONOUS HONEY.

An accident which a short time since befell the war correspondent of the *Daily News* in Armenia, recalls the fact, long known but generally forgotten, that honey sometimes possesses virulently poisonous properties. In this case the correspondent having drunk some water sweetened with honey was shortly afterwards seized with headache, vomiting, coldness of the extremities, temporary blindness, followed by a cataleptic state that appeared to bring him to the verge of death. Suspicion of an intention to poison fell upon an innkeeper and he was arrested, but an examination of his honey, which was from the Batoum valley, where hemlock and henbane grow abundantly, revealed the source of the injury.

It is interesting to note that this incident occurred within a few miles of the spot where more than two thousand years ago a similar accident, but on a larger scale, happened to the "ten thousand" during their celebrated retreat. Xenophon says that two marches from Trebizonde the Greeks encamped in some villages that had been abandoned, where there were a great number of beehives. All the soldiers who ate of the honey suffered from delirium, vomiting, purging, and inability to stand. Those who ate but little appeared intoxicated, whilst of those who ate more some were raving and others seemed to be dying. The soldiers lay on the ground as after a defeat, and a similar consternation reigned. None died, however, the principal effects passing off the next day, though three or four days afterwards the sufferers had the appearance of sick people who had used a violent remedy.

Dioscorides, Pliny, and other authors also mention poisonous honey. Pliny attributes the poisonous properties of one honey from this district to the bees frequenting a plant fatal to the beasts of burden and to goats in particular, which he calls *aegolethron*, or goat's-death, a plant that has been identified with the *Azalea pontica*. He says that when the blossoms of this plant become steeped in the rains of a late spring they contract noxious properties, and in this way the intermittent appearance of poisonous honey was explained. Persons eating this honey are said to throw themselves on the ground and call for cooling drinks. One remedy that Pliny mentions smacks of the *similia similibus curantur* principle: it is a mixture of old honied wine, honey and rue. Another is salt meat, repeated in small quantities and as often brought up again. The peculiar characters of this honey mentioned are that it never thickened, had a peculiar smell that provoked sneezing, and was redder and heavier than good honey. Notwithstanding its bad qualities it was not without a redeeming feature, for Pliny adds that mixed with costus it was the best means for making the skin of females soft and removing pimples from their faces; and that mixed with aloes it disperses the discolorations arising from bruises. Another livid honey from the same district possessed maddening properties; but the poisonous properties of both kinds are said to be dispelled by boiling.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, September 5, 1877.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT, IN THE CHAIR.

Present—Messsrs. Betty, Churchill, Greenish, Hampson, Hanbury and Owen.

The minutes of the previous meeting were read and confirmed.

Elections.

MEMBERS.

Pharmaceutical Chemists.

The following Pharmaceutical Chemists were elected Members of the Society:—

Fletcher, Redfern..................London.
Reece, Thomas......................London.
Wallis, Owen ....London.

Chemists and Druggists.

The following registered Chemists and Druggists were elected Members of the Society:—

Beckett, Thomas Sharpe ....London.
Booth, George ....Chesterfield.
Hughes, Herbert ....Bridgnorth.

ASSOCIATES IN BUSINESS.

The following having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year were elected "Associates in Business" of the Society:—

Allan, William ....Edinburgh.
Ashburner, Isaac ....Broughton-in-Furness.
Palmer, George Smith........... London.
Singleton, Richard ....Preston.
Turtle, William Gillingham ...Chatham.

ASSOCIATES.

The following having passed the Minor examination and having tendered or (paid as apprentices or students) their subscriptions for the current year, were elected "Associates" of the Society:—

Minor.

Blacklock, Philip Walter ......Brighton.
Clarabut, Frank Stone............Folkestone.
Lewin, Arthur Clayton ....Plymouth.
Ord, Septimus William ....Newcastle-on-Tyne.
Roe, Robert ....Lancaster.
Wilkerson, Wallis ....Weymouth.

Modified.

Allman, John Dowling ....London.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary examination and tendered their subscriptions for the current year were elected "Apprentices or Students" of the Society:—

Dodds, Benjamin Bellamy ......London.
Goodchild, Alfred Clarke ......London.
Hutchins, Edward Coxhead ...Bath.
Keys, William Hall...............Birmingham.
Kittle, Ernest J. ....Lower Edmonton.
Lawrence, Matthew Scott ......Stapleton.
Mowat, John Watt ....Coatbridge.
Parry, Robert Henry ....Rhyl.
Pidduck, William Joseph . ....Southport.
Robertson, George ....Portsoy.
Shephard, William Arthur......Spalding.

The names of the following persons were restored to the Register of Chemists and Druggists:—

Henderson, Robert Hood ......Chirnside, Berwick.
Williams, Thomas John ......George St., Godalming.

Two persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

Reports of Committees.

FINANCE.

The report of this Committee was received and adopted, and sundry accounts ordered to be paid.

BENEVOLENT FUND.

The report of this Committee recommended that a grant of £15 be made to the widow of a late member of the Society who had received assistance on three previous occasions. The consideration of another application for aid in securing the election of a child to a school was deferred until the next meeting of the Committee.

The report and recommendations were received and adopted.

LAW AND PARLIAMENTARY.

Prosecution under the Pharmacy Act, 1868.

The report of this Committee stated that the Solicitors had reported that Mr. Thomas P. Allatt, of Hacconby, Bourne, an unregistered person against whom they had been instructed to take proceedings for a breach of the Pharmacy Act, had paid the penalty of £5. The offence for which the proceedings were taken in this case was that of selling an article that had been supplied him by Messrs. Sturton and Sons, of Peterborough, which was labelled as follows and bore a patent medicine stamp:—"Smith's Black Sedative Drops, commonly known as Laudanum (Poison). Wholesale Agents, Sturton and Sons, Peterborough. Sold in $7\frac{1}{2}d.$ and $1s.\ 1\frac{1}{2}d.$ bottles."

The particulars of other cases in which proceedings or inquiries had been commenced had also been furnished by the Solicitor.

Personation at the Preliminary Examination.

The Committee had also recommended that the names of the following persons be erased from the Register of Apprentices or Students, they having fraudulently obtained registration:—

Frank Oates,
George Frederick Webb.

Threatened Prosecution under the Apothecaries Act.

The Secretary had brought before the Committee the case of a member of the Society resident in Blue Anchor Road, Bermondsey, against whom proceedings were threatened by the Medical Defence Association. On receipt of the first communication from this member the Secretary had written asking for particulars, and in reply had received a long narrative which had been laid before the Committee, in which the member stated that although he had received a writ suing for a £40 penalty, no particulars of the offence charged had been furnished. The Committee did not recommend that any action should be taken by the Council until further information was obtainable.

Mr. Churchill said it would be placing members of the trade at a great disadvantage if this practice were followed by the Medical Defence Association of issuing writs without stating particulars. The consequence was that the party sued was obliged to enter an appearance without knowing what he was charged with.

Mr. Greenish said the resolution come to by the Council at a former meeting was that each case should be considered on its merits, and this could not be done until the particulars were furnished. He thought it would be well to appoint a small Sub-Committee, of the nature of a vigilance committee, to consider these cases of prosecution as they arose.

Mr. Churchill said the Chemists' Defence Association had already entered an appearance in the present case, but the same course might be followed by the Medical Defence Association in many others.

The Vice-President did not think the Council need anticipate further cases; it could only deal with what was before it.

After some further conversation the report and recommendations were received and adopted.

A resolution was also passed recommending the appointment by the Law and Parliamentary Committee of a Sub-Committee to watch the cases of threatened prosecutions under the Apothecaries Act.

A letter was read from Mr. Sydney Plowman, apothecary to St. Thomas's Hospital, saying that the Materia Medica Museum at that Hospital was being rearranged, and asking if the Society could favour the Hospital with a set of labels, such as were used in its own Museum.

It was resolved that the request be complied with, so far as the stock of labels in hand would allow.

BENEVOLENT FUND.

List of subscriptions received during the months of July and August, 1877.

	£	s.	d.
A Friend, per Mr. Giles Yarde, 60, Lamb's Conduit Street, W.C.	1	1	0
Allan, William, 90, High Street, Dumfries	0	10	6
Allwright, Isaac B., Bath Place, Derby Road, Chesterfield	0	5	0
Alpha	0	5	0
Atkinson, J., Tynemouth	0	10	6
Bailey, G. W., North Walsham	0	5	0
Barron, Frederick, Bush Lane, Cannon Street, E.C.	5	5	0
Barry, James, Holly Bank, Cliftonville, Northampton	1	1	0
Bartholomew, William, High Street, Egham	0	10	0
Barton, H. Emlyn, Kenilworth	0	5	0
Bates, G., Ripley, Derbyshire	0	10	6
Beach and Barnicott, Bridport	1	1	0
Beattie, Thomas, Langholm	0	5	0
Bell, W. H., 96, Albany Street, N.W.	0	10	6
Best, George, Bondgate, Darlington	0	5	0
Biddle, James William, 54, Dale End, Birmingham	1	1	0
Bigg, Thomas, Great Dover Street, S.E.	1	1	0
Blade, Edward, 60, High Street, Wombwell	0	5	0
Blain, William, Bolton	0	10	6
Bowden, E. and A., 13, Charles Street, St. James's, S.W.	1	1	0
Bowker, William, 259, North Road, Preston	0	5	0
Brand and Co., Lower Stanhope Street, Mayfair, W.	1	1	0
Brelsford, James, Bottom of Moor, Oldham	0	10	6
Briggs, George, Oldbury	0	10	6
Brookes, S., 62, Lisson Grove, N.W.	0	10	6
Brown, H. F., 3, Princes Road, South Norwood	0	10	6
Capper, Edmund, 33, Gay Street, Bath	0	5	0
Carr, Walter P., Berwick-on-Tweed	0	5	0
Carrington, E. G., Bakewell	0	5	0
Casely, Thomas, 176a, High Street, Camden Town, N.W.	0	5	0
Casey, Edward, 10, Canal St. Great Ancoats, Manchester	0	2	6
Cawdell, George, 12, London Street, Norfolk Square, W.	0	10	6
Churchill, J. and A., 11, New Burlington Street, W.	1	1	0
Clarke, Isabella S., 18, Spring Street, Paddington	0	10	0
Clark, Robert, Prospect House, Devizes	0	10	6
Clay, Dod and Case, 52, St. Anne Street, Liverpool	1	1	0
Cleave, S. W., Shanghai	2	2	0
Coleman, E. J., High Street, Cardiff	0	10	6
Coles, John W., 197, Camberwell New Road, S.E.	0	10	6
Cook, Robert, Great Grimsby	0	10	6
Coomber, Sarah, 10, Chester Street, Kennington, S.E.	0	5	0
Corke, Edward, Ticehurst	0	10	6
Cornelius, James, 73, Camden Road, N.W.	0	10	6
Cornell, Philip, Ipswich	1	1	0
Corrie, Isabella A., Bedford	0	5	0
Coulson and Jacombs, 52, Ludgate Hill, Birmingham	0	10	6
Cripps, Johnson, Reepham	0	5	0
Crook, Charles, Mirfield	0	5	0
Cross, John T., 1, King Street, Dover	0	5	0
Cubitt, Charles, 17, Market Place, Norwich	0	10	0
Cull, J., 105, London Wall, E.C.	0	10	6
Cullen, Thomas, 12, St. James's Place, Paisley	0	5	0
Culverwell, J. S., Plough Court, Lombard Street	0	5	0
Davies, R. M., Carmarthen	0	5	0
Davies, R. M., Jun., Llandyssil	0	5	0
Davy, Yates and Routledge, 64, Park Street, Southwark	2	2	0
Deighton, T. M., Bridgnorth	1	1	0
Dickeson, Richard, Esq., J. P., Dover	1	1	0
Dixon, James, North Kelsey, Brigg	0	3	0
Dobell, Dr. Horace, 86, Harley Street, W.	1	1	0
Elliot, Edmund, Guide Post, Morpeth	1	1	0
Epps, James, 48, Threadneedle Street, E.C.	1	1	0
Fardon and Son, Maidstone	1	1	0
Faull, E., High Street, Beeston, Notts	0	5	0
Feaver, John, Bohemia, St. Leonards	0	5	0
Field, J. J., 455, Caledonian Road, N.	1	1	0
Fisher and Sons, Charles, Ramsgate	2	2	0
Fleming, Mrs. A., 107, Prescot Street, Liverpool	0	5	0
Ford, E. B., Pontypool	0	10	0
Frowd, Edward F., Portishead	0	10	6

	£	s.	d.
Fryer, John, Batley Carr, Dewsbury	0	10	6
Gates, H., 10, Coburg Terrace, Anlaby Road, Hull	0	5	0
Gerard, G. R., Great Bedwin, Wilts	0	10	6
Gething, W. B., 75, Fleet Street, E.C.	1	1	0
Glover, John S., 244, Manchester Street, Werneth, Oldham	0	5	0
Goodall, Frederick, 46, Manchester Street, Oldham	0	10	6
Gorrie, Alexander, High Street, Kirkcaldy	0	10	6
Gostling, John H., Halesworth	0	5	0
Greaves, G. S., Mexborough	0	3	0
Greenwell, R. H., Chester-le-Street	0	10	6
Griffiths, A. W., Clerkenwell Green, E.C.	0	10	6
Groves, H. F., 7, Mount Pleasant Place, Lewisham	2	0	2
Hall, Samuel, Eastbourne	1	1	0
Hallawell, J., 63, Wood Street, Liverpool	1	1	0
Hanbury, Cornelius, Plough Court, Lombard Street, E.C.	1	1	0
Harding, Joseph, 4, Market Street, Harwich	0	5	0
Harrison, James, St. Helen's, Lancs.	0	5	0
Harvey, J. W., Selhurst Road, South Norwood, Surrey	0	5	0
Haworth, William, 162, Union Road, Oswaldtwistle	0	10	0
Head, John T., Lewes	0	10	6
Herrings and Co., 40, Aldersgate Street, E.C.	1	1	0
Hickley, G., 101, Church Street, Brighton	0	10	6
Hickman and Metcalfe, Newbury	1	1	0
Hill, Richard C., 67, Old Town Street, Plymouth	0	10	6
Hindle, James, Bank Top, Blackburn	0	2	6
Hodgkinson, Stead & Treacher, 127, Aldersgate St., E.C.	2	2	0
Holme, Isaac C., Market Street, Marple	0	2	6
Holmes, W. Albert, 12, Shaw's Brow, Kendal	0	2	6
Hooper, W., 7, Pall Mall East, S.W.	2	2	0
How, W., South Street, Dorchester	0	10	6
Howman, Philip, Winchcombe	0	5	0
Huggins, Richard, 235, Strand, W.C.	0	10	6
Hughes, Michael, 70, Mill Street, Liverpool	0	5	0
Hughes, Robert, Rhydlydam	0	5	0
Hulme, John, 132, Huddersfield Road, Oldham	0	10	6
Hutchins, C., Wind Street, Neath	0	2	6
Ingoldby, William, Barton-on-Humber	0	2	6
Irish, Thomas C., Southgate	0	5	0
Jameson, W. G., Jun., 48, Baker Street, W.	0	10	6
Jarvis, John, 4, Rue Serviez, Pau	1	1	0
Joce, James, Bideford	0	5	0
Johnson, T. S., 5, Holyrood Terrace, Malvern	1	1	0
Kemp, David, Portobello	0	10	6
Kemp, Joseph, Cullen	0	2	6
King, W. S., Railway Street, New Brompton, Chatham	0	10	6
Lawrance, Edmund, Welwyn	0	11	0
Laws, John, 111, Church Street, N.W.	0	10	6
Littlewood, John O., Sutton-in-Ashfield	0	5	0
Littlewood, S., Sutton-in-Ashfield	0	5	0
Lloyd, J. W., 30, Mount Pleasant, Liverpool	0	10	6
Logsdail, H., 306, Kennington Park Road, S.E.	0	2	6
Lord, R. B., Market Place, Oldham	0	5	0
Loten, Thomas, Hornsea	0	2	6
Loverock, H., Stourbridge	0	5	0
Mace, James, 3, St. James Street, Bacup	0	10	6
Machon, Henry, Market Place, Saffron Walden	0	15	0
Macdonald, Angus, Coatbridge	0	5	0
McDonald, H. S., 51, London Street, Glasgow	0	5	0
Mallen, James E., Llantrissant	0	2	6
Marks and Sons, H., 61, Houndsditch, E.C.	1	1	0
Marshallsay, R. J., Wareham	0	5	0
Mason, James B., 124, Scouringburn, Dundee	0	2	6
Matland, C., 2, Osborn Street, Whitechapel, E.	0	10	0
Maw, Charles, 11, Aldersgate Street, E.C.	1	1	0
Maw, Son and Thompson, 11, Aldersgate Street, E.C.	2	2	0
Mercer, A., Prestwich	0	10	6
Miller, C. B., 8, Osborne Place, Blackheath	0	10	6
Mills, Robert M., Bourne	1	1	0
Milne, William, 9, Wellswood Place, Torquay	0	3	0
Moore, Richard, Post Office, Ossett	0	5	0
Mott, John C., 17, Bull Street, Birmingham	0	5	0
Munday, J., 14, Rue de la Paix, Paris	0	5	0
Myers, G. H., Market Hall, Welton	0	5	0
Neale, H., Riddings, near Alfreton	0	5	0
Nesbit, J., Portobello	0	10	6
Odell, G. W., 17, Chapter Street, Westminster	0	5	0
Oldham, John, Market Street, Mansfield	0	10	6
Paffard, Frank, 36, Town Hall Street, Blackburn	0	10	6
Parker, W., King Street, Darlaston	0	10	6
Parkin, William, Gomersal	0	2	6
Parkinson and Son, 27, Southampton Row, W.C.	1	1	0
Parrington, W., Commercial Street, Batley	0	5	0
Peatson, H. R., 102, Broughton Road, Salford	0	11	0
Pickard, Matthew, 71, Broughton Road, Salford	1	1	0
Pickering, J., Crowle	0	5	0
Pickup, R. L., 89, Piccadilly, Manchester	0	5	0
Pinch, James E., 5, Cheap Street, Bath	0	5	0
Prichard, Edward, 10, Vigo Street, W.	1	1	0
Ratheram, W., Hampton in Arden	0	5	0
Ralfs, Henry C., High Street, Old Brentford	0	7	6
Rees, John, Llandovery	0	2	6
Reeve, J. J., Newhaven	0	2	6
Rippon, R. O., Great Berkhampstead	1	1	0
Roberts, D. P., Llangunider, Crickhowell	0	2	6
Roberts, Robert B., Llanfairfechan	0	2	6
Roberts, Robert J., Towyn	0	5	0
Robinson, E., Deritend, Birmingham	0	10	6
Scruby, W. Y., Milton Cottage, Acton	1	1	0
Sell, W. H., High Cross, Barnstaple	0	5	0
Severs, S. T., 7, Lupus Street, Pimlico	0	5	0
Sims, W., Aberaman	0	5	0
Simpkins, J., Minchinhampton	0	10	6
Simpson, Allwood, 9, Melbourne Street, Stalybridge	0	5	0
Skirrow, W. E., Bingley	0	10	6
Slater, John, Beaumaris	0	10	6
Smith, A., 35, High Street, Crediton	0	2	6
Smith, J. F., Earlstone	0	5	0
Solomon, W. H., Falmouth	0	10	6
Soole, J. H., 3, Millbrook Road, Freemantle	0	5	0
Stansfield, Robert Wright, 4, Stockport Road, Denton	0	10	0
Stephen, James, Protstonhill, Gamrie	0	2	6
Stephenson, J. N., Heckmondwike	0	5	0
Stephenson, Robert, Chapmangate, Pocklington, Yorkshire	0	2	6
Stevenson, J. C., The Strand, Todmorden	0	10	6
Story, H. W., 43, Fish Street Hill, E.C.	0	10	6
Stuart, Henry J., Ingatestone	0	5	0
Taylor, F. J., Newport Pagnell	1	1	0
Taylor, Frank, Pateley Bridge	1	1	0
Tempest, Joseph, 54, Regent Street, Leylands, Leeds	0	5	0
Thomas, H. J., 8, London Street, Bath	0	5	0
Thompson, John, 11, Aldersgate Street, E.C.	1	1	0
Thompson and Capper, Liverpool	1	1	0
Thresh, J. C., 11, Eagle Parade, Buxton	0	5	0
Thurlby, G., Gorleston	0	5	0
Townsend, C., Ashby Lodge, Havelock Road, Addiscombe	0	10	6
Turner, Benjamin, Tanworth, Hockley Heath, Birmingham	0	2	6
Turner, James, Stacksteads	0	5	0
Twiss, W., Hunstanton	0	10	6
Walker, J., 149, Widemarsh Street, Hereford	0	10	6
Wall, H., 67, Market Street, Shaw, Near Oldham	0	5	0
Wand, Stephen, 18, Haymarket, Leicester	0	5	0
Warner, C. H., 55, Fore Street, E.C.	1	1	0
Waters, H. G., Emsworth	0	10	6
Watson, Mason, 33, Prudhoe Street, Newcastle-on-Tyne	0	10	6
Wealthall, Alfred, 156, Great Jackson Street, Hulme	0	10	6
Weston, Charles, Ventnor, Isle of Wight	1	1	0
Whitworth, John, 80, Goldsmith Street, Nottingham	0	10	6
Wilkinson, Benjamin J., 1, Middleton Rd., Kingsland, E.	0	10	6
Wilkinson, Samuel, 35, Watson Street, Birkenhead	0	5	0
Williams, Evan, St. Clears	0	10	6
Williams, M., Oaklands, Builth	0	5	0
Williams, Sophia, 23, Pulteney Street, Bath	0	10	6
Williamson, James, 11, Union Street, North Shields	0	5	0
Wilson, R., Hessle Road, Hull	0	2	6
Wilson, William, 21, High Street, Hanley	0	5	0
Woodward, John L. L., Bridgwater	0	5	0
Wright, A., Olney	0	5	0
Wrighton, Henry, Market Place, Cannock	1	1	0
Wyke, J., Abergavenny	0	5	0

Donations.

	£	s.	d.
Froggatt and Son, Eyam	0	5	0
Goodwin, John, Lower Clapton	52	10	0
Howard, John E., Lordship Lane, Tottenham	5	5	0
Price, Charles W., 197, Camberwell New Road	0	10	6

Provincial Transactions.

CHEMISTS AND DRUGGISTS' TRADE ASSOCIATION.

Meeting of Law Committee.

A meeting of the Law Committee was held at the office of the Association, 23, Burlington Chambers, New Street, Birmingham, on September 3, 1877, at 1 p.m.

Mr. S. U. Jones (Leamington), President, in the chair.

Present :—Messrs. Barclay (Birmingham), Churchill (Birmingham), Hampson (London), Holdsworth (Birmingham), Jervis (Sheffield), and the Solicitor of the Association.

The minutes of the previous meeting of the Committee were read and approved.

The Secretary read communications from Messrs. Flux and Co., the Solicitors of the Pharmaceutical Society, and from the Registrar of that Society, respecting cases of infringements of the Pharmacy Act.

The Secretary stated that a writ issued out of the Exchequer Division of the High Court of Justice for the sum of forty pounds had been served upon Mr. Henry Wiggins, 236, Blue Anchor Road, Bermondsey, London, S.E., a registered chemist and druggist, a member of the Association and of the Pharmaceutical Society. The plaintiffs were the Apothecaries' Company, and the amount claimed was for penalties incurred by the defendant for alleged infringements of the Apothecaries Act, 1815.

The President inquired if Mr. Wiggins, being a member of the Pharmaceutical Society, had informed the Secretary of that Society that proceedings had been taken against him.

The Secretary said immediately he received the information from Mr. Wiggins he requested him by letter to at once communicate with the Pharmaceutical Society and solicit their assistance, as the last day for entering an appearance to the writ would be the 5th instant; he did not know the nature of the reply Mr. Wiggins had received from the Society, but he had thought it best for him to have a personal interview with the members of the Committee, and he had requested him to attend that meeting.

Mr. Wiggins then waited on the Committee when his case was fully discussed. In reply to a question from the President he said he had informed the Secretary of the Pharmaceutical Society that a writ had been served on him by the Apothecaries' Company, but up to that date he had received no acknowledgment to his letter. Mr. Wiggins then withdrew.

Some further discussion then took place when it was moved by the President, seconded by Mr. Jervis, and unanimously resolved:—"That the Solicitor be instructed to appear to the writ issued by the Apothecaries' Company out of the Exchequer Division of the High Court of Justice against Mr. Henry Wiggins, 236, Blue Anchor Road, Bermondsey, London, S.E."

The Secretary said he had received communications from members residing in London, Sheffield, Manchester, Blackburn, Chesterfield, Kegworth, Denton, Kirkby Stephen, Halifax, Bury, Heywood, Rochdale, Attleborough, Sherbourne, Kidsgrove, Middlesborough, Stockton-on-Tees, Chester, etc., etc., reporting cases of illegal trading under the Pharmacy Act, 1868, in some instances strongly protesting against the seeming inactivity of the Association in taking prompt steps to suppress such infringements of the Act. He (the Secretary) thought the time had arrived for the Association to distinctly inform its members that where scheduled poisons were being sold by unregistered persons, labelled in accordance with the provisions of the Act, the Association was totally unable to take proceedings against the vendors, as the power to sue in such cases was, by the Act, vested in the Registrar of the Pharmaceutical Society.

Mr. Barclay said proceedings could be taken by the Association against unregistered persons selling scheduled poisons not properly labelled, and he would move:—"That evidence having been brought before this Committee that scheduled poisons are still being largely sold by unregistered persons, this Committee considers it desirable that proceedings should be instituted, and it empowers the Solicitor to take action under Section 17 of the Pharmacy Act, 1868, in such cases as he thinks expedient."

Mr. Hampson seconded this resolution, which was carried unanimously.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

(*Continued from page* 178.)

The PRESIDENT took the chair again at two o'clock, when the first paper read was "Report on the Active Principles of Cayenne Pepper," by J. C. Thresh, F.C.S.

THE ACTIVE PRINCIPLE OF CAYENNE PEPPER.

BY J. C. THRESH.

In November last I received from Messrs. Hopkin and Williams, 8½lbs. of alcoholic extract of cayenne, obtained from 30lbs. of the fruit. This extract had separated into an upper fatty layer and a lower one containing but little fat.

By treating the whole with benzine and evaporating, 2¼lbs. of a deep red fat was obtained. This was dissolved in warm petroleum and left for a few days, at the end of which time it was found to have deposited a large quantity of a crystalline fat. This was removed and pressed, and after repeated crystallizations first from petroleum, and afterwards from spirit, a colourless, solid fatty acid was obtained, soluble in ether, alcohol, etc. Melting point 62° C. When burnt no acrid vapours were evolved. These and other reactions show that this substance is palmitic acid, and it probably constitutes the greater part of the cayenne fat.

The petroleum solution from which the palmitic acid had been removed was treated repeatedly with dilute alcohol to remove the capsaicin. This process proved on the large scale extremely tedious and unsatisfactory, since I only succeeded in obtaining from three to four drachms of the active principle. This, however, is probably partly due to the comparatively small amount of capsaicin in the original fats. I have examined the fat obtained from various peppers, and find that by the same process very varying amounts of capsaicin is obtainable. The capsaicin thus obtained retained obstinately a trace of colouring matter, but by crystallization from ether I obtained about one drachm of what I believe to be the absolutely pure principle.

·356 grams burnt with lead chromate gave ·9105 CO_2, and ·2995 H_2O.

·381 grams gave ·9745 CO_2, and ·318 H_2O, from these the calculated percentages are :—

	I.	II
C	69·74	70·26
H	9·3	9·28
O	20·96	20·46

These results agree fairly well with the formula $C_6H_{14}O_2$ obtained by Dr. Buri from a small portion of the capsaicin which had been obtained from Natal pepper. As a microscopical examination of this pepper led me to infer that it was yielded by a different species of capsicum, I was anxious to discover whether the principles of both were identical. So far as I have observed this is the case. The disappointingly small quantity of capsaicin obtained has not enabled me to advance much further in my investigation. In fact, it is almost useless to attempt this until some process is devised whereby it may be obtained more readily and in larger proportions.

Oxidized with nitric acid, at least four products are obtainable; oxalic and succinic acids, an almost insoluble crystalline acid, and an oily body. Neither of the latter were obtainable in sufficient quantity for further examination.

Treated with dry chlorine, the crystals of capsaicin assume a deliquescent appearance, then gradually darken in colour, a tenacious dark brown resinous substitution product being ultimately obtained. During the reaction hydrochloric acid is evolved. It is probable that more than one product is formed. I have not succeeded in obtaining a crystalline chlorine compound.

Capsaicin forms crystalline compounds with barium, calcium, and mercury, but the difficulty lies in getting them free from uncombined capsaicin. The combustion of the barium and calcium compounds gave discordant results.

The colouring matter of cayenne fat, traces of which sometimes adhere obstinately to the active principle, is easily obtained from the marc left when the pepper has been thoroughly exhausted by spirit. This marc percolated with benzine yields an orange red solution, and upon evaporation a deep orange red oil. It is insoluble in proof spirit, slightly tints rectified spirit, and is only slightly soluble in boiling alcohol. An alcoholic solution of palmitic acid, capsaicin, or castor oil, takes up a considerable portion. It dissolves readily in oils, sulphide of carbon, petroleum, ether, amyl alcohol, and chloroform; from solution in the latter fluids it is precipitated by dilution with alcohol. Strong sulphuric acid turns it first indigo blue, then black.

Nitric acid strikes a blue colour, changing first to green and becoming ultimately brown.

Hydrochloric acid does not affect it.

All oxidizing agents convert it into a brown fatty matter.

Exposed to the air the colour slowly fades, and an indistinctly crystalline fat is deposited.

Mr. Williams said the extract forwarded to Mr. Thresh was not made by his firm, but by Messrs. Wright, Layman, and Umney.

Mr. Umney said he had experienced great difficulty in getting the oleoresin of capsicum in a uniform condition, there being generally a separation of the fatty matter, and it seemed to him Mr. Thresh had fairly elucidated the cause of its separation. The oleoresin was not of the same kind as was found in ginger, which was perfectly uniform and fairly homogeneous. The yield of crude capsicin from capsicums was enormous, as much as 20 or 25 per cent., whilst the oleoresin obtained from ginger was only about 10 per cent.

Mr. Greenish asked if Mr. Umney could tell what capsicum this was obtained from, as there were several kinds known. One, which was very much sold in this country ground for giving to canary birds, came from Natal, but on examination he found it agreed with the Nepaul capsicum.

Mr. Umney said the official chillies (*Capsicum fastigiatum*) only were used, and not those of *Capsicum annurum*, nor the Nepaul cayenne pepper of commerce.

Mr. Gerrard said he had at the request of Mr. Thresh asked Professor Ringer of University College to make some experiments on the physiological action of capsaicin, but when given internally it produced such violent griping pain and purgative effect that he was obliged to discontinue its use.

Professor Attfield remarked that it was interesting to find that free palmitic acid was obtained from the capsicum. Of course there were other substances that yielded free fatty acids and acid glycerides, such as cocculus and cantharides, but the number was not great.

Mr. Benger asked in what doses the capsicin was given as described by Mr. Gerrard.

Mr. Gerrard replied in $\frac{1}{25}$ of a grain.

The President said it was necessary to distinguish carefully between two terms which had been used, namely, capsicin, used by Mr. Umney, which was the oleoresin yielded in abundance from the capsicum, and the capsaicin described by Mr. Thresh which appeared to be a powerful body only obtainable in very small quantities. This latter body he presumed was almost too powerful for advantageous use in medicine, and indeed there seemed little object in seeking for a concentrated active principle, seeing that the capsicum itself yielded its active matter readily in a sufficiently concentrated state to admit of any medical application that might be required. He did not see that any very practical results were likely to follow this investigation although it was of course desirable that they should know as much as possible of all the proximate constituents of substances used in medicine. He had himself for many years had experience of what Mr. Umney described as capsicin, which had been used to some extent in making what was known as soluble cayenne pepper, which was common salt mixed with the oleoresin and coloured if necessary with anatto.

Mr. Groves asked if the experiments alluded to by Mr. Gerrard included the application of capsaicin to the skin as a vesicant.

Mr. Gerrard said a solution of it in glycerine and weak alcohol was applied externally, and produced the same local effect as tincture of capsicum; there was more redness and severe heat, but no blistering.

Mr. Atkins said it would be a matter of practical interest to know if there was any improvement suggested in the menstruum which could be adopted for the use of this article as an external application. It was pretty well known to chemists that some vesicating papers were prepared with an extractive principle of capsicum.

Mr. Gerrard remarked, that as far as he knew, no vesicating paper was made from capsicum or any of its preparations. Cooper's sinapine tissue was he believed made from capsicin, but it was not a vesicant.

Mr. Manby (Southampton) said he had had considerable experience, both with mustard leaves and with Cooper's sinapine tissue, and he understood that the latter produced a more satisfactory result than the former, but without so much irritation.

Mr. Greenish confirmed what had been stated by Mr. Gerrard, that the mustard paper did not contain any vesicating principle except that of mustard.

A vote of thanks having been passed to Mr. Thresh, the next paper read was—

Essential Oils with Special Reference to the Hydrocarbons contained in them.

BY WILLIAM A. TILDEN, D.SC. LOND., ETC.

For some time past I have been engaged in experiments upon certain essential oils, in the hope of being able to throw some light upon the chemical constitution of the hydrocarbons of the terpene family, which, as is well known, exist in a great many of the volatile oils obtained from plants.* In the course of these researches, however, I have naturally been led to examine, more or less closely, some of the other hydrocarbons and oxidized bodies which accompany the terpenes, and which in many cases contribute very materially to the peculiar characteristics of the essential oil.

The process I have chiefly employed for the identification and classification of the terpenes is based upon a reaction discovered by myself, and of which the first account was published in the Journal of the Chemical Society for June 1875. It consists in passing nitrosyl chloride gas (NOCl) into the terpene, either pure or diluted with chloroform or alcohol according to circumstances, and cooled to about —10° C. by a freezing mixture. A white crystalline body is deposited which always has the formula

$$C_{10}H_{16}NOCl$$

and is therefore made up of a molecule of the terpene with a molecule of nitrosyl chloride. From this compound by treatment with alcoholic potash, or by cautious heating, the elements of hydrochloric acid may be removed and the substitution product

$$C_{10}H_{15}(NO)$$

obtained. These nitroso-compounds are easily obtainable in large crystals, and, by their crystalline form, melting point and optical characters, they serve to determine the character of the terpenes from which they have been derived.

It is necessary here to remark that the name terpene must be carefully restricted to compounds of formula $C_{10}H_{16}$, and must not be extended to the polymeric hydrocarbons $C_{15}H_{24}$ and $C_{20}H_{32}$ into which the terpenes are easily converted by heat or by the action of energetic chemical agents such as sulphuric acid. I find that the reaction to which I have referred occurs only with the true terpenes ($C_{10}H_{16}$) and not with their polymerides. As further indicating difference of structure in these two

* I cannot allow the present opportunity to pass without expressing my sense of the obligation I am under to Messrs. Schacht and Towerzey, of Clifton, for their liberality in supplying to me at cost price all the essential oils used in the latter part of the work. The grant of money that was entrusted to me by the Conference last year has thus been rendered more fully serviceable than would otherwise have been possible.—W. A. T.

classes of bodies, it may be remembered that Mr. Kingzett in his interesting experiments on the atmospheric oxidation of essential oils found that the C_{10} compounds gave peroxide of hydrogen, whilst C_{15} hydrocarbons did not.

Turpentine Oils.—At present I have examined closely only two of the different varieties of turpentine oil met with in European commerce, namely the American and the French.

American turpentine oil is obtained chiefly from *Pinus australis* and *P. Tæda*, and is the kind which is principally employed in this country.

The commercial samples I have examined gave generally about 80 per cent. of nearly pure terpene (australene) boiling at 156° to 159°. The distilled hydrocarbon varies slightly in its action upon a ray of polarized light. 100 mm. gave me in one case a rotation of 15°, in another 13° 18′ to the right.*

French or Bordeaux turpentine oil is the product chiefly of *Pinus maritima*, and is distinguished from American oil by its optical characters. It consists principally of a hydrocarbon (terebenthene) which boils at the same temperature as australene, but rotates the polarized ray to the left. 100 mm. gave me a rotation of − 33° 49′.

The nitroso-derivatives of these two hydrocarbons agree in composition, in solubility and in melting point, also in forming crystals which not only belong to the same (monoclinic) system, but have the same crystallographic elements. The appearance is, however, quite different in the two crystals, so that once seen they are readily distinguished from each other and recognized even when quite small. The measurement of these crystals is in the able hands of Professor N. S. Maskelyne, and his observations will shortly be published.

Both American and French turpentine oils, when mixed with spirit and nitric acid according to Wiggers' process, yield crystals of hydrated terpin, $C_{10}H_{20}O_2H_2O$. These crystals are rhombic and are generally four sided prisms terminated by pyramids.

Whether obtained from right or left-handed turpentine oil their corresponding angles are equal.

I am indebted to Dr. Armstrong for a specimen of Russian turpentine oil, which distils chiefly between 168° and 180°. According to Hanbury and Flückiger, Russian turpentine is the produce of *Pinus sylvestris*. Now if this is the case, it is probably identical with Swedish turpentine oil, and this substance has quite recently been examined by A. Atterberg (*Deut. Chem. Ges. Ber.*, x., 1202). According to this chemist there are two terpenes in this turpentine, one boiling at 156·5° to 157·5°, and dextro-rotatory, but to a greater degree than Berthelot's Australene. The other terpene, which Atterberg calls sylvestrene, boils at 173°—175°, and does not agree with any already known terpene. Its specific rotatory power is +19·5°. I am sorry to say I have not yet prepared the nitroso-compounds from my Russian turpentine, so that I cannot say in what way the terpenes contained in it are related to others that I have examined.

Juniper Oil.—English oil of juniper (*Juniperus communis*) gave about one-third of its bulk below 160°. This liquid is almost inactive upon the polarized ray. 100 mm. gave a rotation of about 1° to the left. The nitroso-compound crystallizes in precisely the same manner as the corresponding compound from French turpentine, and in all other respects agrees with it completely. The other constituents of oil of juniper seem to be similar to those of turpentine oil, that is to say, they consist chiefly of hydrocarbons which are polymeric with the terpene and boil at 180° and upwards.

Sage Oil.—Mr. M. M. Pattison Muir placed at my disposal small quantities of two liquids obtained by fractional distillation from this oil. As he will himself give an account of this essential oil it is only necessary to mention here that one of these liquids has the same boiling point as terebenthene and very nearly the same optical characters. It also yields a nitroso-derivative, $C_{10}H_{15}NO$, which is identical with that obtained from French turpentine oil.

These terpenes from turpentine, juniper and sage oils, I regard as allotropic modifications of the same substance, since they agree in all respects except in the optical properties of the liquid hydrocarbon, and in the slight peculiarity of the crystals of the nitroso-derivative.

Oil of Savin—Juniperus Sabina.—The English oil was used, and the sample operated upon was believed to be perfectly genuine. According to the books, including 'Pharmacographia,' this oil is represented as having the same composition as oil of turpentine. Considering that savin is a coniferous plant, closely allied with the juniper, and most of the coniferæ yield volatile oils of the same general character, it is not unnatural to expect that this would be the case. So far as my experiments at present go, this is, however, a mistake. It certainly does not contain a terpene of the same formula as the turpentine terpenes. The sample which I have examined had the well-known repulsive odour of the plant and a yellowish green colour. Its specific gravity was ·9159. A column of the liquid, 100 mm. long, gave a rotation of +55°. Hanbury found 50 mm. rotate to the extent of +27°, an observation which is, practically speaking, the same as mine. By repeated fractional distillation a small quantity, not more than about 5 per cent. of the whole, was obtained, which boiled at 159°—160°. This had a dextrorotatory power, 100 mm. deviating the polarized ray = 46° 18′. This fraction, however, is not a hydrocarbon at all.

The first indication that it was not a terpene was the impossibility of obtaining from it a crystallized nitroso-compound by the usual process. When analysed by combustion with oxide of copper, supplemented by a stream of oxygen, ·3975 gram gave 1·1415 gram of CO_2 and ·388 gram of H_2O. These results calculated into percentages of carbon and hydrogen give the following numbers from which it will be seen that the liquid contains oxygen and is isomeric with ordinary camphor.

	Exp.	Calc. for $C_{10}H_{16}O$.
C_{10}	78·56	78·94
H_{16}	10·84	10·53
O	—.—	10·53

This liquid possesses an odour which is much less disagreeable than that of the original oil though to a certain extent reminding of it.

The greater part of the savin oil consists of liquids which boil at temperatures above 200°. They are probably hydrocarbons that are very easily polymerized by heat, for a portion that has once been distilled over cannot be redistilled without leaving a very considerable residue of yellow colour and high boiling point, and which on cooling becomes so viscid as to be semisolid. The examination of these higher fractions is not yet completed. It may, however, be said that savin oil is certainly not a true turpentine, for it does not contain a terpene.

Lavender.—English oil of lavender when submitted to distillation began to boil at 135° to 140°, but the ebullition was probably chiefly due to the escape of a little vapour of water, which came over first. The temperature rapidly mounted to 190° and between 190° and 195°, about one third of the oil passed over. The residue in the flask was rather darker in colour than the original oil. A portion of the first distillate dried by calcium chloride gave no crystalline nitroso-compound by the action of nitrosyl chloride, neither did it answer to this reaction after it had been carefully fractioned and treated with sodium. A small quantity of liquid thus prepared boiled at 171°—172°. Lavender oil seems to be a mixture of liquid camphors. Mr. Shenstone has under-

* All determinations of rotatory power made in the course of this work were performed with a Wild's polaristrobometer, using monochromatic light from a Bunsen flame, coloured by common salt and borax.

taken its further examination, and I, therefore, leave the matter in his hands.

Oil of Caraway.—Two and quarter pounds of English oil of caraway submitted to distillation gave about seven fluid ounces of a terpene boiling below 178°, and of which 100 mm. rotate the polarized ray 11° to the right. The residue contained a further quantity of the hydrocarbon, but it consists chiefly of carvol ($C_{10}H_{14}O$ – B.P. 225°), a compound which is also dextrogyrate in its action upon polarized light. 25 mm. give +15·6°. It is characterized by forming a peculiar crystallizable compound with sulphuretted hydrogen $(C_{10}H_{14}O)_2SH_2$.

Carvol is converted into an optically inactive isomeride, carvacrol, by treatment with phosphoric acid.

As to the terpene contained in caraway oil, it gave me a nitroso-compound, which is identical in melting point, solubility and crystalline form with that obtained from the terpenes of the sweet orange and other plants of the orange tribe.

Oil of Sweet Orange Peel. Essence de Portugal.

This oil, like most other essential oils, varies in composition. This is especially true of those which, like lemon, orange, and bergamot, are obtained by expression or by the sponge process.

Thus, with reference to oil of sweet orange peel, Wright ('Year-Book of Pharmacy,' 1871) states that he obtained from this oil no less than 97·2 per cent. of hydrocarbon boiling below 179° and 2·8 per cent. of yellow resinous substance not volatile without decomposition. The material used in my experiments was the contents of an original tin of Ess. Portugal, obtained from Messrs. Piesse and Lubin, and when submitted to distillation it yielded about three-fifths of its bulk at 174°—175°. The residue boils at a much higher temperature. It is greenish-yellow, very fragrant, smelling much more strongly of the fruit than the distilled portion. After standing some weeks it began to deposit a colourless crystalline substance, and this after some months has increased considerably in quantity. A similar deposit is obtained both from bergamot and lemon oils, and all three probably consist of the substance which has been called "bergaptene," and which is perhaps identical with hesperidine. This is a question which I propose to investigate as soon as time will permit. The terpene of the orange oil is a liquid which has an odour by no means so powerful as that of the original oil. It boils at 174°—175° and 100 mm. rotate a polarized ray 85·9° to the right. It yields by appropriate treatment a nitroso-compound which melts at 71° and crystallizes very beautifully in large flat prisms. The alcoholic solution of this compound is lævorotatory.

Oil of Bergamot.—The best commercial oil of bergamot was submitted to distillation. About three-fifths, containing a little water and acetic acid, came over below 190°. This gave about one-fourth of its bulk below 180°, and this, after treatment with sodium for some hours, came over almost entirely below 176°, so that the oil readily yielded 15 per cent. of its bulk of terpene. Probably more might have been obtained. 100 mm. of this hydrocarbon rotate the polarized ray 75·6° to the right. This hydrocarbon gives the same nitroso-compound as hesperidene, the terpene from sweet orange. They are, therefore, chemically identical. They are also very near together in regard to physical properties. With boiling point 174°—175° and optical characters not greatly different, I think it probable that if completely purified they would be found to consist of the same substance.

The higher boiling portions of the bergamot oil are green, and consist of oxidized compounds which have not yet been properly examined. After standing some time a considerable quantity of colourless crystalline matter (bergaptene) is deposited.

Oil of Lemon.—I have reserved to the last the description of lemon oil, because the investigation of the hydrocarbons it contains has been somewhat troublesome. It yields by distillation a large quantity of a colourless liquid boiling between 173° and 176°, and 100 mm. of which were found to rotate the polarized ray 61·5° to the right. When treated with nitrosyl chloride it yields only a very small quantity of a nitroso-chloride which, however, contains 17·13 per cent. of chlorine, and therefore has the general formula, $C_{10}H_{16}NOCl$. This precipitate was, however, found to be a mixture of two substances, for when heated as described at the beginning of the paper, it gives two nitroso-substitution compounds: one recognizable by its crystalline form as nitroso-terebenthene, the other *probably* identical with nitroso-hesperidene.

Further, when some of the hydrocarbon was mixed with nitric acid and alcohol according to the process of Wiggers, it gave, on standing, crystals of a terpin hydrate in quantity very much smaller than was obtained from a similar quantity of turpentine oil. But though the quantity of crystals was very much smaller than is given by either right or left-handed turpentine oil, their form is identical with that of ordinary terpin hydrate, and quite undistinguishable from it. This was shown by actual measurement of the crystals, which, after recrystallization from spirit, are large and well formed.

Again, Dr. Gladstone, who examined in 1864 a perfectly genuine lemon oil gave +67·7° as the rotation of 100 mm. of the hydrocarbon. I only found +61·5°.

These considerations lead to the conclusion that the sample I had to examine contained a quantity of a hydrocarbon which is lævogyre and yields the same chemical derivatives as terebenthene. Since oil of lemon is so well known to be commonly adulterated, I think it by no means improbable that French turpentine, which is lævogyrate, may really have been added to this sample. The admixture of 8 or 10 per cent. of ordinary French turpentine oil would be sufficient to reduce the rotatory power to the extent mentioned. But notwithstanding the undoubted existence of this hydrocarbon in the sample examined, it is by no means proved that its presence is adventitious. It may be a normal constituent of the oil. Further inquiries only can settle this question.

But there are other facts to be accounted for. Some of the liquid distilled from the oil of lemon was oxidized by boiling with acidified bichromate solution. It gave a considerable quantity of paratoluic and terephthalic acids. This could not have been entirely due to the presence of a turpentine oil, for the turpentines give by oxidation mere traces of these acids. Moreover, when the terpin hydrate crystals, referred to above as having been obtained from the oil, were oxidized in the same manner, they gave a very minute quantity of the same acids. The distilled lemon oil, therefore, contains something else which, by oxidation, yields terephthalic acid. The hydrocarbons of the orange group do not furnish this compound. I can, therefore, only suppose that this other constituent is cymene, $C_{10}H_{14}$, which boils at 176°, that is at nearly the same temperature as the lemon hydrocarbon. Its presence would not be discernible by the odour which resembles to some extent that of lemon, and would account for the difficulty experienced in preparing the nitroso-chloride of the terpene. I have made some attempt to isolate the cymene which I suppose may be present in the following way. The distilled oil (173°—176°) was boiled for about ten days in a flask with an upright condenser, in the hope of polymerizing the terpenes. The liquid then distilled off between the same limits of temperature left a considerable quantity of liquid of higher boiling point, slightly yellow colour and strong lemon odour. The distillate, however, was not much changed in optical rotatory power. It was then sealed in tubes and heated to about 240° for about twelve hours. On distilling off again at about 176°, a further residue of high boiling polymerized hydrocarbon was left, but the distillate still rotates +55° 9′ for 100 mm.

There are probably several varieties of cymene, of which one is, I believe, dextrogyrate, but at the most to the extent of 12° or 13° for 100 mm.*

A specimen prepared by myself from turpentine by the action of sulphuric acid was found to be quite inactive, and another separated from oil of cummin, and kindly lent to me by Dr. C. R. A. Wright, is also destitute of rotatory power. I am, therefore, still in doubt as to whether cymene is a natural constituent of oil of lemon or not.

General Observations.

Of the various constituents of volatile oils, the terpenes ($C_{10}H_{16}$) which are present in so many of them, contribute less than any other to the peculiar odour of the oil. The natural terpenes are colourless limpid liquids which vary in specific gravity from about ·84 to about ·86. They are divisible into two groups as follows:—

1. Turpentine Group.
   Boiling point 156° to 160°.
   Melting point of nitroso-derivatives 129°.
   Form solid crystalline hydrated terpin $C_{10}H_{20}O_2 \cdot H_2O$

2. Orange Group.
   Boiling point 174° to 176°.
   Melting point of nitroso-derivative 71°.
   Form (by Wiggers' process) no solid crystalline terpin hydrate.

The liquids included in each group are allotropic modifications of the same hydrocarbon distinguished one from another by their various rotatory action on the polarized ray. It will, however, be found, I believe, that the terpenes from several different plants will on further examination be conclusively proved to be really identical and not simply isomeric. This, I believe, to be the case with the terpenes from French turpentine and sage, also with the terpenes from orange peel, bergamot and lemon. The differences of odour which they usually exhibit are undoubtedly due to the presence of small quantities of the heavier constituents of the oil, which it is almost impossible to separate completely by simple distillation.

P.S.—I am aware that it is sometimes stated that oil of lemon in course of time is transformed into turpentine, and I suppose there can be no doubt that old samples gradually acquire a terebinthinate flavour and odour. I should be glad if members of the Conference would communicate details regarding any instance of this supposed conversion that may have come under their own personal observation. I should also be grateful for specimens if they can be accompanied by a reliable statement of the history of each sample.

Mr. Kingzett said he was glad to find that Dr. Tilden's examination of various essential oils had yielded results comparable with, and confirmative of, his own investigations referred to by Dr. Tilden. Both methods served to classify the numerous hydrocarbons, generally termed terpenes, into groups of distinctive constitution. He might remark, *en passant*, that in an early paper, he (Mr. Kingzett) had demonstrated the existence of a terpene of the formula $C_{10}H_{16}$ in the oils of caraway, bergamot, lemon, etc. From his researches, as also those of Dr. Wright, it followed that all terpenes represented by the formula $C_{10}H_{16}$ yielded cymene $C_{10}H_{14}$ by suitable treatment, and it further appeared that cymene from all sources was identical; he failed to perceive the grounds upon which Dr. Tilden believed in the existence of more than one cymene.

Dr. Wright asked if there was any distinct evidence offered by Dr. Tilden as to the dissimilarity of the various cymenes obtained. Some few weeks ago, Dr. Tilden applied to him for samples of cymene for the purpose of ascertaining whether they possessed dissimilar rotating power on polarized light, but he had not heard whether he had found any difference in that respect. As regards other physical properties, specific gravity, refractive power, etc., the cymenes from eighteen or twenty essential oils were prepared by himself and his coadjutors; but no difference whatever could be discovered in any particular. As far as he remembered, the rotary power had not been examined by Dr. Gladstone, and he should like to know if any other addition to their knowledge on that particular had been made.

Professor Attfield, in reply, said Dr. Tilden did not seem to have examined the cymenes alluded to by Dr. Wright.

Mr. Umney thought no fixed rule could be laid down as to the rotating power of the essential oil of caraway of trade; for instance, sometimes the whole plant was put into the still, sometimes distillers used Dutch caraways and sometimes Mogador caraways, and it could not be, supposed that the rotating power of the oils derived from such different materials could be identically the same.

Mr. Schacht said he thought that the physical properties, of which Dr. Tilden had taken cognizance referred to the hydrocarbons distilled from the oils, not to those of the essential oils themselves. In some of these he believed there were great differences in the rotating power, some turning one way and some the other.

Professor Attfield said this matter was not actually mentioned in the paper, but Mr. Schacht was quite right in supposing that he had experimented on the hydrocarbons obtained from the fractional distillation of these oils.

Mr. Groves observed that it would be very useful if Dr. Tilden or any one else who studied this matter could tell them how to prevent that disagreeable change of flavour which took place in oil of lemons left for a time in contact with air.

Dr. Wright said there was a practical way of preventing this change in flavour in some essential oils which was adopted by perfumers, and consisted in keeping the oil in a tightly stoppered bottle and filling the bottle up with water whenever the stopper was taken out. When prevented in this way from access to the atmospheric air the oil retained its flavour much longer than in a half empty bottle.

Mr. Schacht said it was rather curious that while Dr. Tilden considered the odorous principles of these oils to be due to the oxygenated body associated with the hydrocarbons, this beautiful smell of the freshly prepared essence should be spoiled by further oxidation.

Mr. Atkins said he was struck some time ago with the tendency in certain essential oils to show a terebinthine result, but he found by comparative experiments that if the stock were kept in a cellar away from light and heat this process of decomposition was almost entirely prevented. It was probable also that the action of gas in the shop had a deleterious effect on these bodies.

A vote of thanks was passed to Dr. Tilden for his paper.

The next paper read was—

On Essential Oil of Sage. Part II.

BY M. M. PATTISON MUIR, F.R.S.E.,
Assistant Lecturer on Chemistry,
AND S. SUGIURA,
Chemical Student in The Owens College, Manchester.

1. In a paper communicated to the Conference at the Glasgow meeting, one of us gave an account of preliminary experiments upon the oil obtained by distilling sage with water. We have continued these experiments, and beg now to lay the results before the Conference.

2. The oil was separated into four main constituents; one of these boiled between 156° and 158°, and another between 166° and 168°. Reasons were given for believing that each of these liquids consisted of a terpene of the formula $C_{10}H_{16}$. A third portion boiled from 198° to

* Guareschi, *Gazetta Chimica Italiana*, iii., 545—550.

203°, and was regarded as the oxidized liquid constituent of the oil. The higher fractions deposited solid matter when cooled; this solid matter possessed some of the properties of ordinary camphor.*

3. The liquid boiling from 156° to 158° has not been subjected to analysis, but the results of a determination of its vapour density, and a consideration of its general properties leave no doubt that it really consists of a terpene, $C_{10}H_{16}$.

The vapour density was determined by a slight modification of Hofmann's method which we have described in a paper communicated to the Chemical Society.† The method is easily and quickly carried out, and yields results sufficiently accurate for general purposes.

The following numbers were obtained:—

Height of barometer = 755 mm.
Temp. of air = 17°.
Height of Mercury column in barometer tube = 561 mm.
Temp. of vapour = 185°
Tension of Mercury vapour at 185° = 12 mm.
Weight of Mercury required to occupy space formerly occupied by vapour = 1018·4 grams.
Temp. of Mercury = 20°.
Hence volume of vapour = 73·28 c.c.
Weight of liquid = 0·0682 gram.
Weight of volume of Hydrogen equal to volume of vapour under same conditions of temperature and pressure = 0·00101 gram.

$$\text{Hence } \frac{M}{2} = \frac{\cdot 0682}{\cdot 00101} = 67\cdot 46. \quad \text{Calculated} = 68.$$

4. Dr. Tilden has kindly examined the action of nitrosyl chloride upon this terpene. The action is in every respect similar to that observed between nitrosyl chloride and the terpene from French turpentine oil.‡ The nitroso-derivative, $C_{10}H_{15}NO$, forms monoclinic prisms of the same form as those described by Story-Maskelyne in an appendix to the paper of Tilden referred to. "The plane ends are replaced by a sort of pyramid which makes them look more pointed. In general appearence the crystals are not unlike dog-tooth spar."§

The melting point of the nitroso-derivative is 129°, the alcoholic solution of this substance is optically inactive.

A column of the terpene 100 mm. in length gave a rotation of 32·2° to the left for the soda flame.‖

5. Dr. Gladstone has been so very good as to make determinations of the refractive indices of this and of the higher boiling terpene. His results for the terpene boiling at 157° are as follows:—

$\mu A = 1\cdot 4611$. $\mu D = 1\cdot 4667$. $\mu H = 1\cdot 4855$ at 24·5° C.

Hence specific refractive energy = 0·0534, and
Refraction equivalent = 72·6.

6. These determinations of optical properties agree very closely with those which have been made for the terpene from French turpentine oil (terebenthene). Moreover, the specific gravity of the sage terpene is practically identical with that of terebenthene. Riban¶ gives the formula 0·8767—0·0008377*t*, as expressing the specific gravity of terebenthene at any temperature, *t*, below 80°. At 15° the specific gravity would be 0·8643. The specific gravity of the sage oil terpene is 0·8635 at 15°. The boiling points of the two terpenes are also almost identical—probably really identical. The small quantity of cymene which is almost certainly contained in this terpene (see par. 11) would tend slightly to decrease the specific gravity, and slightly to increase the boiling point of the liquid.

* 'Year-Book and Tr. of Brit. Pharm. Conf.,' 1876, p. 564.
† *Chem. Soc. J.*, vol. ii., 1877, p. 140.
‡ See Tilden. *Chem. Soc. J.* [2], xiii., 514.
§ Extract from letter from Dr. Tilden.
‖ Tilden, *Chem. Soc. J.*, vol. i., 1877, p. 557.
¶ *Compt. Rend.*, lxxviii., 288.

In the following table we have noted some of the physical properties of terebenthene and of the terpene from sage oil boiling at 157°.

B.P.	Sage Terpene. 157°.	Terebenthene. 156°25.
Sp. grav. at 15°	0·8635	0·8643*
Refractive indices at 24°:		
for A.	1·4611	1·4596†
„ D.	1·4667	1·4653†
„ H.	1·4855	1·4845†
Refractive energy	0·0534	0·0532†
Refraction equivalent	72·6	72·5†
Spec. rotatory power [α]	−37·3	−32·4‡ (for transition tint.)

7. The vapour density of the liquid boiling at 166° to 168° was determined.

Height of barometer = 758 mm.
Temperature of air = 18°.
Height of mercury column in barometer tube = 511 mm.
Temperature of vapour = 185°.
Tension of mercury vapour at 185° = 12 mm.
Weight of mercury required to occupy space formerly occupied by vapour = 874·7 grams.
Temperature of mercury = 20°
Hence, volume of vapour = 64·61 c.c.
Weight of liquid = 0·0804 gram.
Weight of volume of hydrogen equal to volume of vapour under same conditions of temperature and pressure = 0·001129 gram.

$$\text{Hence } \frac{M}{2} = \frac{\cdot 0804}{\cdot 001129} = 71\cdot 2. \quad \text{Calculated} = 68.$$

Two experiments, in addition to that the results of which are detailed, were carried out, but in each a small quantity of air found its way into the barometer tube; the results therefore were too low. In every case a small quantity of brown resinous matter remained in the little bottle unvolatilized; hence, it appears, either that the terpene contained a small quantity of a substance boiling very considerably above 185°, or that the action of such an amount of heat as is represented by this temperature exerted a decomposing (polymerizing?) action upon the terpene. The presence of 4 per cent. of a terpene of the formula $C_{15}H_{24}$,—supposing this to remain completely unvolatilized,—would bring the observed vapour density to 68·3, which is almost identical with the calculated number.

8. We are again indebted to the kindness of Dr. Tilden for experiments upon the action of nitrosyl chloride upon this terpene. Dr. Tilden says, "I could get no solid products from this liquid. The action of the gas caused effervescence immediately, and this is always a bad sign. I suspect this to be a mixture containing a hydrocarbon of the $C_{15}H_{24}$ type. I have never got any solid compounds from these."

A column of the terpene 100 mm. in length was found by Dr. Tilden to rotate the plane of polarization 17·7° to the left.

9. Dr. Gladstone has kindly made determinations of the refractive indices of this terpene for the lines A, D, and H.

$\mu A = 1\cdot 4588$. $\mu D = 1\cdot 4646$. $\mu H = 1\cdot 4830$.

Hence, specific refractive energy = 0·0522, and refraction equivalent = 71.

10. The specific gravity of this terpene was 0·8866 at 15°.§

A mixture of 96 per cent of the terpene boiling at 157° with 4 per cent of a terpene of the type $C_{15}H_{24}$—assuming the latter to have a specific gravity of 0·915, which is

* Riban, *Compt. Rend.*, lxxviii.; 288.
† Gladstone, *Phil. Trans.* for 1863.
‡ Berthelot, *Ann. Chem. Pharm.*, lxxxviii., 343.
§ 'Year-Book and Tr. Brit. Pharm. Conf.,' 1876, p. 566.

about the mean of the densities of terpenes of this formula as determined by Gladstone, and assuming that no condensation of volume occurred through mixing the two liquids—would have a specific gravity of about 0·865 at 15°. The assumption that the liquid boiling at 167° is really such a mixture is not therefore borne out by the actual specific gravity of the liquid. We are rather inclined to believe that sage oil contains two terpenes of the formula $C_{10}H_{16}$, differing in physical properties, and perhaps a small quantity of a terpene of a higher molecular weight.

11. It has been already shown by one of us that the lower terpene of sage oil, boiling at 157°, very probably contains cymene. The experiment described in Part I. of these investigations * was repeated, and with a result identical with that formerly obtained. The liquid, which gave all the qualitative reactions of cymene, was analysed. It boiled at 176°–178°.

0·1885 gram gave 0·6125 gram CO_2 and 0·181 gram H_2O.

	Calculated for $C_{10}H_{14}$.	Found.
Carbon . . .	89·55	88·61
Hydrogen . .	10·45	10·72

A small quantity of this cymene was oxidized by chromic liquor; it yielded terephthalic and acetic acids. The residue, after polymerizing the terpene with sulphuric acid, and distilling in steam, was boiled for some days with chromic liquor, no solid oxidation product was obtained.

Wright† has shown that the terpene from orange-peel oil, boiling at 178°, yields no cymene when treated with strong sulphuric acid and distilled in steam; nor does it yield a trace of terephthalic acid on oxidation. The same chemist‡ has also shown that oil of turpentine yields cymene by treatment with sulphuric acid, etc. According to some chemists, terephthalic acid is one of the products of the oxidation of oil of turpentine; according to others this acid is not produced by oxidizing that oil. The fact that when cymene had been removed from the liquid portion of sage oil, boiling at 157°, the residue yielded no terephthalic acid on oxidation, but that the original liquid, before treatment with sulphuric acid, etc., did yield this acid,§ seems to point to the cymene which was present as the source whence the terephthalic acid was derived.

The varying results obtained in the oxidation of oil of turpentine are probably due to the varying composition of the specimens employed. When free from cymene this oil appears to yield no trace of terephthalic acid on oxidation.||

12. The liquid boiling at 166°–168° was treated with strong sulphuric acid, etc., as described in a previous paper. Cymene was again obtained. The polymerized residue yielded no solid oxidation product on treatment with chromic liquor.

13. Each terpene was treated with bromine in the manner previously described. A small quantity of a liquid, boiling from 174° to 177°, and yielding terephthalic acid on oxidation, was, in each instance, obtained.

14. The physical as also the chemical properties of the terpene boiling at 157° leave little doubt of the identity of this compound with terebenthene, the terpene obtained from French oil of turpentine. The terpene boiling at 167°–168° we believe to contain small quantities of a body of higher boiling point. We have already given reasons for this belief.

In a letter to one of us, Dr. Gladstone says, "The lighter terpene is practically identical with that from turpentine in refraction and dispersion, as well as in boiling point and specific gravity. The heavier one with the higher boiling point has a lower refractive energy than any terpene I have examined. Is it pure $C_{10}H_{16}$?"

Investigations carried out on larger quantities of oil can alone enable us to make positive statements regarding the composition of the higher terpene.

15. When that portion of the original oil which boiled above 190° was submitted to fractionation, a considerable proportion of it was found to boil between 198° and 203°.* For this liquid the name of salviol was proposed. We have analysed this liquid, and have also made a determination of its vapour density.

(1) 0·1664 gram gave 0·48 gram CO_2 and 0·162 gram H_2O.
(2) 0·130 „ „ 0·374 „ CO_2 „ 0·124 „ H_2O.

	Calculated for $C_{10}H_{16}O$.	Found. I.	II.	Mean.
Carbon . . .	78·94	78·69	78·46	78·57
Hydrogen . .	10·53	10·81	10·59	10·70
Oxygen . . .	10·53 (by diff.)	10·50	10·95	10·73

Vapour density determination.

Height of Barometer = 755 mm.
Temperature of air = 17°.
Height of mercury column in barometer tube = 492 mm.
Temperature of vapour = 185°.
Tension of mercury vapour at 185° = 12 mm.
Weight of mercury required to occupy space formerly occupied by vapour = 788·1 grams.
Temperature of mercury = 17°.
Hence, volume of vapour = 58·16 c.c.
Weight of liquid = 0·0786 gram.
Weight of volume of hydrogen equal to volume of vapour under same conditions of temperature and pressure = 0·00107 gram.

$$\text{Hence } \frac{M}{2} = \frac{\cdot 0786}{\cdot 00107} = 73{\cdot}46. \quad \text{Calculated} = 76.$$

A small quantity of resinous matter remained in the little bottle at the conclusion of the experiment. The weight of this non-volatile residue was found to be 0·0014 gram. The number given above as representing the weight of liquid taken is the difference between the actual amount weighed out and the weight of the non-volatile residue.

It would appear that the salviol examined was not perfectly pure, or that this substance is decomposed in someway at the temperature to which it was raised, with production of resinous matter. There can, however, be little doubt that the formula $C_{10}H_{16}O$ really represents, not only the quantitative composition, but also the molecular weight of salviol.

From the smallness of the quantity of salviol at our disposal we have not been able to carry out further experiments upon this substance.

16. The solid which separated from the higher boiling portions of sage oil has been examined by us. After several sublimations it melted at 184° to 186°. In Part I. the number 187° was given—this number we believe to be rather too high. The boiling point of sage camphor is 210°. We have attempted to determine the specific gravity of sage camphor; but as the result cannot as yet be looked upon as trustworthy, we do not give it, contenting ourselves with stating that the specific gravity appears to be greater than that of common camphor, and less than that of borneol. Sage camphor crystallizes in monoclinic prisms, ∞ P. m.P: the crystals are generally rounded off on the prism edges. An alcoholic solution of sage camphor is without action upon the polarized ray.

* 'Year-Book, etc.,' 1876, p. 565.
† *Chem. Soc. Journ.* [2], xi., 552.
‡ *loc. cit.*
§ 'Year-Book, etc.,' 1876, p. 565.
|| W. Carleton Williams (*Ber. deut. Chem. Ges.*, v., 1024).

* 'Year-Book, etc.,' 1876, p. 563.

(1) 0·112 gram gave 0·324 gram CO_2 and 0·104 gram H_2O.
(2) 0·129 „ „ 0·375 „ CO_2 „ 0·124 „ H_2O.

	Calculated for $C_{10}H_{16}O$	Found. I.	II.	Mean.
Carbon	78·94	78·83	78·86	78·84
Hydrogen	10·53	10·31	10·67	10·49
Oxygen	10·53 (by diff.)	10·86	10·47	10.67

We have not made a vapour density determination, inasmuch as the results of analysis leave little doubt as to the correctness of the formula $C_{10}H_{16}O$, and the boiling point prevents the supposition that the molecular weight is represented by a multiple of this formula.

17. A quantity of sage camphor was dissolved in chloroform, and an equal quantity of bromine was gradually added, the vessel being kept well cooled. Reddish coloured crystals were almost immediately deposited. The whole was allowed to stand over sulphuric acid in vacuo, for 12 hours. When the vessel was brought into the ordinary atmosphere the crystals very quickly melted, and hydrobromic acid was evolved in considerable quantities. On standing for several days over sulphuric acid in vacuo crystals were again formed.

On distilling the red liquid very large quantities of hydrobromic acid were evolved, a camphor-like solid was deposited, and a considerable portion of the liquid was resinized. The solid camphor-like substance, after several sublimations, melted at 160° to 163°. A similar substance having the same melting point was prepared by treating sage camphor directly with bromine, washing with caustic soda, and subliming. In Part I, the melting point of the crystals obtained by treating a solution of sage camphor in chloroform with bromine is stated to be 132° to 133°. We believe that these crystals were most probably impure, containing either uncombined bromine or, it may be, portions of an addition product of bromine and camphor. We find that the melting point of the crystals, produced as described above, increases after each sublimation until the maximum 160° to 163° is attained. During the earlier sublimations hydrobromic acid is evolved.

18. When sage camphor was distilled in contact with phosphorus pentasulphide the greater part of the material underwent resination, but a small quantity of liquid was obtained which after washing with soda, drying, and fractionating, gave the reactions of cymene: on oxidation with chromic liquor terephthalic acid was produced.

19. A few grams of sage camphor were dissolved in about ten parts of concentrated nitric acid, the liquid was boiled for thirty hours or so, the acid was distilled off, the residual semi-resinous matter was dissolved in hot water, and the solution was boiled down and set aside. A small quantity of a colourless indistinctly crystalline body was obtained. This substance melted at 172° to 176°. The quantity at our disposal was too small and not sufficiently pure to allow of an accurate analysis being made. The numbers which we did obtain agreed as closely as could be expected with those required by the formula for camphoric acid, $C_{10}H_{16}O_4$.

20. Sage camphor is almost certainly an isomer of common camphor: its melting point, boiling point and other physical properties, as also the difference of its behaviour towards bromine, prevent us, however, from believing that it is identical with common camphor.

21. In the first part of these investigations the action of hydrochloric acid gas upon sage oil was said to result in the formation of one, or perhaps two, chlorhydrates stable at 200° or so. On making a determination of the amount of chlorine in the liquid boiling from 195° to 200°, 1·85 per cent. only was found to be present. Determinations of carbon and hydrogen gave no constant results, thus we obtained 70·53, 67·34, and 73·2 per cent. of carbon, and from 9 to 10·5 per cent. of hydrogen. These results show that the liquid under examination was not really a chlorhydrate at all, but was evidently a mixed substance. If a chlorhydrate be in the first instance produced by the action of hydrochloric acid upon sage oil, it is evidently very readily decomposed by washing with water. The statement in par. 7 of Part I,* that the chlorhydrate of sage terpene is with great difficulty decomposed by water is therefore erroneous.

22. When sage oil is distilled a very large quantity of resinous and semi-resinous matter is produced. That portion which remained after the thermometer had risen to 240° in the first distillation of the oil was a thick, viscid, very dark coloured liquid. In the hope of procuring a further quantity of salviol we subjected this liquid to distillation in a current of superheated steam. About ⅛th of the total liquid was obtained in the distillate, the remainder having become almost solid. The distillate after drying and fractionation was found to consist almost completely of camphor, held in solution by terpene. No salviol was obtained. We did not consider that an analysis of the residual resin would yield any trustworthy results.

23. Our investigations are not sufficiently complete to allow us to enter into theoretical discussions concerning the structural formulæ of camphor and the substances related to it, nor can we venture to make any generalization concerning the members of the terpene group. Both of these subjects are however of so much interest, that we propose, if the Conference will make us a further grant, to endeavour to prepare much larger quantities of the terpenes, the salviol, and the camphor from sage oil, and to determine the physical and chemical properties of these bodies, combining this investigation with a research into the constitution of the camphors in general.

We take this opportunity of again returning our best thanks to Drs. Gladstone and Tilden for their kindness in examining the optical and other properties of the two sage terpenes.

Professor ATTFIELD said this paper was very interesting. Of course it was rather chemical than pharmaceutical, and seeing that the Chemical and Royal Societies had now followed the plan which the British Association had initiated and the Conference practised of making grants in aid of such researches, he thought the Conference might now discontinue, at any rate for the present, further grants for such purely chemical investigations. The sum annually at the disposal of the Conference was not large, still it was formed by the contributions of pharmacists, hence workers at pharmaceutical research had first claim upon it. He feared, however, that such claimants would be only too few.

The PRESIDENT remarked that this was hardly a paper which would admit of much discussion, but he was sure they would agree in thanking the authors for it.

(*To be continued.*)

Parliamentary and Law Proceedings.

THE SALE OF CASTOR OIL PILLS.

At the Cannock Petty Sessions, on Monday last, before B. Gilpin, Esq., and Colonel Harrison, George Ridding, grocer, of Walsall Road, Cannock, was charged by Mr. J. G. Horder, Inspector under the Food and Drugs Act, for the southern division of the county, with having sold a certain drug, to wit, "castor oil" pills, the same not being of the nature, substance, and quality demanded by the purchaser; also with selling a compound drug not composed of the ingredients in accordance with the demand of the purchaser. Mr. Hutchinson (from the Clerk of the Peace's office, Stafford) prosecuted, and Mr. James E. Underhill represented the defendant, instructed by Messrs. Reade Brothers, wholesale drug-

* 'Year-Book' etc., 1876, p. 562.

gists, of Wolverhampton, the original manufacturers of the pills in question.

George Toy, assistant to Mr. Horder, proved purchasing the pills. The boxes were labelled, "Castor Oil Pills—one or two to be taken occasionally, and at bedtime," and Mr. Horder said he received a sealed packet of the pills which he delivered to the public analyst for examination.

Mr. E. W. T. Jones, F.C.S., of Wolverhampton, and public analyst for the southern division of the county, said he had analysed the sample of pills delivered to him by Mr. Horder, on the 25th of May last. The six pills sent weighed 18·8 grains, which was equal to about three grains per pill. He examined four of the pills for mercury, with the result that he detected the presence of about 9·98 per cent. of calomel in the whole mass. Besides this, there was aloes, jalap, rhubarb, ginger, and a trace of colocynth, with one or two other substances which he was unable to identify in the sample. He did not discover the slightest trace of castor oil in the pills. He considered that the compound would be injurious to health, as it contained calomel under the disguise of so innocent a name as "castor oil."—By Mr. Underhill: It was not possible to make castor oil pills, and it did not necessarily follow that persons would know this, and understand that the pill was another compound. It would not be possible to put more than a grain of castor oil in a pill, at which rate two hundred pills would be necessary for a dose. He knew that it was common to substitute compound pills, all over the country, and sell them as "castor oil pills." He could not say that the castor oil pill had been understood by the public for twenty-five years to be an aperient pill merely. He was certain that castor oil pills would not produce the same effect as castor oil itself; in fact, he should not take a "castor oil pill" to be an aperient at all. He knew that the "pill" in its present form cost the manufacturer a great deal more than if castor oil were used, and, therefore, it would be no saving to use the present ingredients. There was about the third of a grain of calomel in each pill, and an ordinary dose of calomel was generally more than this. He knew that the Sanitary Committee of the Wolverhampton Town Council had had these pills under their consideration, and had sent a caution to the chairman of the local pharmaceutical association respecting them. Since that time Messrs. Reade had issued small circulars to be given away with each box of pills, stating that the pills contained no castor oil, but were simply aperient.—Re-examined: There had been convictions for the sale of similar pills, where the contents of the pill were not so strong as in the present case.

Dr. Day, F.R.C.P., Stafford, said he had made a rough examination of the pill and found the substances in it mentioned by Mr. Jones. He thought that if ignorant persons bought these pills, under the impression that they contained castor oil, and knowing that castor oil was so innocent a laxative that it could be given to any sex at any age, the use of the pills as such would be very objectionable, because they contained calomel, aloes, and colocynth. Even admitting that there were persons and conditions in which these pills might be taken with impunity, and in some cases with advantage, still there were other persons and conditions where in his judgment, they would be very objectionable, and often injurious. Witness described different diseases and conditions of health in which the use of the pills would be inappropriate, under the impression that a simple laxative was being taken. To the ordinary average of cases the quantity of mercury contained in two of the pills would not be injurious, but there were also certain conditions in which it would produce salivation, and, if continued, even death. He had himself salivated a lady with half a grain of calomel. In his opinion he did not think it was the metallic mercury which salivated, but the chlorine or oxygen combined with the metal, and given up in a nascent form.—Cross-examined: He admitted that the cases he had mentioned would be exceptional ones. He was not aware that there was a difference of medical opinion on the action of calomel in kidney disease. He was unaware until he was consulted on the subject that there were any such things as "castor oil pills."

Mr. Underhill, in the course of his remarks for the defence, said the Act under which the offence was brought was useful in cases where articles were adulterated, and not of proper quality, but it did not apply in the present case. This was a "test" case, as the solicitor for the prosecution had stated. The Act stated, "Any person who shall sell to the prejudice of the purchaser, any article, food, or drug, which is not of the quality, substance, and nature demanded by the purchaser, is liable to a penalty not exceeding £20," but to which there were certain exceptions. He argued that the prosecution had shown no infringement of this clause. They had proved that "castor oil pills" had been sold for many years all over the country, and that it was physically impossible to admix any quantity of castor oil with the pills. So it was quite plain that it was impossible to comply in the latter respect. He contended that they had sold the article which they had contracted for. They did not sell the public what they did not demand, for the public asked for "Reade's Castor Oil Pills" and they obtained them. It was understood that the pills were an aperient medicine, and it was not necessary, because they were called by the name of "castor oil," that they should contain any of that substance. Again, it was only possible that they could believe the present pills injurious if they took for granted what Dr. Day had said, viz., that it might do some persons injury, if they thought they were taking castor oil and were not, but with the common average of people it would be beneficial. He should call a medical gentleman from Wolverhampton who would tell them on the contrary that the pills were not objectionable. He concluded by stating that the Act gave an exception in the case of "proprietary" or patent medicines. Now this was a "proprietary" medicine, as Mr. Reade would tell them. The component parts of the pills were from a private recipe which belonged to the firm, and the case therefore failed in this way. He called

Mr. T. Reade, manufacturing chemist, of Wolverhampton, who said he had been connected with the trade seventeen years. The pill sold as "castor-oil pills" were a proprietary medicine. He had never had any complaints as to the effect of the pills during the twenty-five years they had been manufactured.—Cross-examined: The same pills could be made by any person in the kingdom if the component parts were discovered. He was not aware that it was the universal custom to name proprietary medicines as Reade's, Cockle's, or Jones' pills.

Mr. James Mason, chemist, Stafford, said he had been in practice for forty years. Castor oil pills had been sold for about twenty years as an article of commerce. They did not contain castor oil, but were supposed to act in a similar manner.—Cross-examined: As a respectable tradesman he should not sell the pills labelled "castor oil" without informing the public that they were a substitute. He agreed with Dr. Day, that if taken habitually the pills might be injurious to some persons.

Mr. F. A. Manby, surgeon, Wolverhampton, was next called. He stated that the cases mentioned by Dr. Day were very exceptional ones. He considered the pills harmless in the great majority of cases, and of a mild character.—Cross-examined: He did not think, speaking morally, they should be labelled "castor oil pills."

The Bench, after some consideration, said, it had been decided to convict on the ground that the pills were not composed of ingredients in accordance with the purchaser's demand. Defendant would be fined £2 and costs—£14 9*s*. As regarded the proprietary character of the medicine, the bench had nothing to say.—*Wolverhampton Evening Express.*

INQUEST UPON A CHILD AT DEVONPORT.

On Wednesday, August 29th, an inquest was held in Devonport before the Borough Coroner, Mr. J. Vaughan, respecting the death of an infant, six months old, named Vogwell. The mother stated that as the child was suffering from diarrhœa she went without the child to Mr. Codd, a chemist, from whom she received on a first occasion some castor oil, and on the previous Tuesday week a mixture, a teaspoonful of which was to be given every four hours. The administration of the medicine was usually followed by sickness and sleep. On the following Saturday she went to Mr. Codd and told him the child had been very sick, and he then gave her a powder, telling her to give one half to the child at once and the other in six hours. The child vomited after taking the first half, and shortly afterwards the mother, thinking she saw signs of an approaching fit, called in Dr. Row. Dr. Row asked what she had been giving to the child, and upon her telling him, he asked for the remainder of the mixture and powder and took them away saying that he was going to Mr. Codd. Upon his return he prescribed for the child, but eventually it died on the Saturday.

Dr. F. Row then said: On Saturday last a little before midday I visited a child in Duke Street. The child appeared to be about six months old. It was lying in its mother's lap, and had the feeding bottle in its lips. Immediately afterwards it vomited a considerable quantity of milk, and I was told by the mother that this had occurred frequently during the last previous few hours. The surface of the child was very pale and cold, the eyes sunken and glazed, and the pupils of the eyes contracted. On trying to get the history of the case, I was told that the child had been dressed that morning, that it had had diarrhœa previously, and that it had taken two doses of medicine since the previous evening from a bottle that was shown to me. Up to this stage I had made no observation. I was also told that a portion of the powder had been given that morning. On looking at the mixture and smelling it I concluded that it contained opium. I looked at the portion of the powder, but formed no conclusion as to its composition. I concluded that the child was then under the influence of opium; and I might have said so, but I am not certain whether I did or not. In order to be quite sure what the contents of the mixtures were, I suggested seeing Mr. Codd, who I was told had given the medicines. I went to the shop of Mr. Codd with the nurse, who carried the medicines.

The Foreman: Did you give any opinion before going to Mr. Codd's of what was the matter with the child?—I have already said that I possibly stated that the child was suffering from opium.

Did you give any opinion of the disease the child was suffering from?—No.

Then you had no idea up to this time of what disease the child had?—I knew that it had been suffering from diarrhœa.

Dr. Row continued: I saw Mr. Codd behind the counter of his shop, and told him that Mrs. Vogwell's child was in a dangerous or dying state, and that I had been told that the medicines that the nurse had had been prescribed by him. Before we had entered, I casually saw Inspector Matters—who was within a few yards of Mr. Codd's side door—and I asked the nurse to call him. He came, and stood outside, while the nurse and I went into the shop. While we were in the shop I said to Mr. Codd, "I presume the medicine contains opium." He said "Yes, but not to any amount to do injury. I presume there could not originally have been more than ten minims in the bottle."

The Foreman: It is very important to know which word Mr. Codd used—minims or drops.

Dr. Row: He may have said drops; I give him the benefit of it. I asked him to seal the bottle; that was done, and it was immediately given into the hands of the police. I returned to see the child, went home directly, and gave medicine for it. From that time up to eleven at night I saw it five or six times. During that time the sickness ceased, and the child appeared to rally; but throughout the day the surface was cold as a stone. Besides the medicine I administered, I ordered the child to be enveloped in warm flannels, frequently repeated; and this was done carefully, I believe. The next morning I was told the child had died during the night.

The Foreman: Now I wish to ask you, Dr. Row, whether if the medicine had been supplied by a medical man, instead of a chemist, you would have sent for a policeman, and taken him and the medicine to the surgeon's residence, as you did to Mr. Codd's?

The Coroner: I don't think that that has anything to do with the matter.

Mr. Williams: I should like an opinion on the matter.

Dr. Row: I didn't send for a policeman; I saw Inspector Matters near the door of Mr. Codd's shop.

Mr. Williams: All very convenient, I dare say.

Dr. Row: Excuse me, Mr. Coroner, I must call that gentleman to order when he implies animus on my part in this matter. I totally, distinctly, and emphatically deny any animus or arrangement of any kind, and it is too bad to cast such an imputation on me.

Mr. Williams thought it would be better if Dr. Row answered the question.

Dr. Row: I have already said that I made no arrangement of any kind, and I will tell you now that if one of my most intimate friends, being a medical man, had been concerned, I should have had exactly the same feeling towards him as I had to Mr. Codd, and should have acted in the same way.

Mr. Williams: And should have taken the medicine to his house?

Dr. Row: Certainly, I should have done so.

Mr. Williams said he was satisfied with the answer.

The Coroner: You had no further object in calling the Inspector than to give him charge of the medicine if necessary?

Dr. Row: It did not even amount to that. My feeling, and the only feeling I had was that I desired some one to hear what took place in the shop. Afterwards I found it desirable to hand him the medicine.

A Juror: Is it right to administer opium to a child of that age?

Dr. Row: Well, it is, I believe, frequently done; but if you ask me to give an opinion about it, I may say that it is unsafe, and is generally regarded as an unwise proceeding with infants of a very tender age.

A Juror: It is done though, is it not?

Dr. Row: It is.

The Coroner: It is a fact, is it not, that a very small drop of opium on some constitutions will kill?

Dr. Row: It is so far regarded as a dangerous thing that at the examination of students for entry into the profession, a question is sometimes put,—"How much opium would you give a child six months old?" If the person said he would give any he would be at once plucked; the answer should be "none."

A Juror: What did you treat the child for when you gave the medicine?

Dr. Row: It was undoubtedly suffering from the effects of opium—I am certain of it.

A Juror: And you treated the child for that?

Dr. Row: Yes; it was certainly under the influence of opium.

The Coroner: You have made a *post mortem* examination of the body?

Dr. Row: In company with Mr. Cutliffe I have to-day examined the body of the child.

The Foreman to the Coroner: Did you authorize the *post mortem* examination?

The Coroner: I did.

The Foreman: And ordered Dr. Row to make it.

The Coroner: Yes, and I may explain that the rule is to order the medical man who treated the deceased to make the examination, if any be necessary, after death, and I think it is a very proper one.

Mr. Williams thought it might have been better if an independent surgeon had been called in.

The Coroner: Dr. Row wisely took care to be accompanied by another of the most respectable medical men in the town—Mr. Cutliffe, and you can have his evidence also if you please. I desire Dr. Row to be examined and I shall take his evidence. Besides, the jury can order another *post mortem* examination if they think it necessary.

Mr. Shillabeer (on the jury): It seems to me that that is very much like locking the stable door after the horse is gone.

Mr. Williams: I wish to point out that Dr. Row had been called in on the case only a few hours, and he takes the nurse and an inspector of police to Mr. Codd's house. I think a gentleman entirely independent of Dr. Row should have been engaged.

The Coroner: You can do so now if you think it necessary, and if there are any reasons for it; but under any circumstances I should desire Dr. Row to be present at the examination, for it would be due to him.

Mr. Williams: As Dr. Row appears to be the prosecutor—

Dr. Row: I protest against such a remark, sir.

The Coroner sharply to the Foreman: I beg, sir,—nay I insist, that you will not use such a word as that again, and that *you* will not show any animus or feeling in this matter, or take any side. We have no sides here; we have only to discharge a public duty.

Mr. Williams: I have not the slightest animus at all sir; I am only asking a question that, as the Foreman of this jury, I am entitled to do, and a question that I expect to be answered. I came here for the purpose of fully inquiring into a certain case brought before us, and inasmuch as Dr. Row has taken on himself, perhaps very properly—

The Coroner: Dr. Row was appointed to do what he has done; he has not taken anything on himself.

Mr. Williams: Dr. Row has stated that if the medicine had been supplied by a medical man he should have taken it to him as he did to Mr. Codd.

Dr. Row: Certainly.

Mr. Williams: Then would it not have been more satisfactory to have engaged a gentleman independent of Dr. Row?

The Coroner: The usual course has been followed, sir. We must go on with the evidence.

Mr. Williams: I hope you will not think there is any animus on my part; I only wish to see fair play.

The Coroner: Go on with the evidence.

Mr. Williams: I trust, sir, you will withdraw the remark you made just now.

The Coroner: Will you proceed, Dr. Row?

Dr. Row then proceeded: The body was that of a full-grown, well-nourished, fine child. There were no marks specially noticeable about the body, except those of decomposition. The organs were healthy with one exception. The stomach and intestines were quite empty, but in the middle part of the small intestines, extending over three or four feet of their length, portions of the gut were run into one another in the form of intussusception. Considerable portions were thus sheathed, or telescoped, into one another. I never met such a case before, nor ever heard of it in a child. It was most remarkable, and it is proof positive that it existed before the child's death and was the cause of the death; it was undoubtedly the natural result of disease.

A Juror: From sickness or vomiting?

The Doctor: There it is. It could not have been the result of any medicine rightly or wrongly given.

A Juror: Then was the sickness caused by this?

Dr. Row: Or was it caused by sickness? There is the difficulty I cannot decide. Doubtless sickness would have been one of the symptons of this state of things.

A Juror: What is the greatest amount of opium you give to a child six months old?

Dr. Row: I can only repeat what I have already said.

The Coroner: But you say that opium is still given to children?

Dr. Row: Always with more or less of danger. I could not have given a certificate of the death of the child without some inquiry.

The Coroner: Certainly not. It was impossible consistently with your duty; and the *post-mortem* examination has discovered a fact that could never have been known without it.

The Foreman: Do you think now that the state in which you found the intestines of the child originated from sickness?

Dr. Row: I cannot say how it originated. Constant purging, with vomiting, would be the most likely means of causing it; but whether it was due to one or the other I cannot tell.

Mr. Codd, who had been most ready to afford every information in the case was sworn, and said—The mixture that I prescribed for the deceased child consisted of 40 minims of tincture of catechu, 25 minims of tincture of cardamons, 10 minims of tincture of kino, 10 minims of essence of ginger, 10 minims of chloric ether, 6 of aromatic spirit of ammonia, 5 minims of tincture of opium, half an ounce of syrup, and chalk mixture to make $1\frac{1}{2}$ ounces—*i.e.*, 12 drachms or teaspoonsful, or doses.

The Coroner: On your oath, was there anything in that which you would not have given your child under similar circumstances?

Mr. Codd: Certainly not; and I may say that one of my own children at the age of two months has taken as much opium in one dose—and taken it under medical treatment, bear in mind—as is contained in the whole of that bottle of medicine. Further, she has taken it repeatedly.

The Coroner, to Dr. Row: Now having heard that prescription and what Mr. Codd has said, I put it to you whether you think there is anything really harmful in the mixture?

Dr. Row: I do not think I ought to be called upon to pronounce an opinion on such a point as that. The statement now made by Mr. Codd does not agree with what he told me himself in his shop. He distinctly told me that there were ten minims of tincture of opium in the mixture —I was not certain just now whether the word used was minims or drops, but the inspector has decided that it was "minims." As to the merits or demerits of giving such a mixture I will not express an opinion.

A Juror: Can you safely say that the child did not die from taking it?

Dr. Row: Whether such a mixture was rightly or wrongly given to a child so young, it had nothing to do with the state of the intestines of the child as I found them.

Mr. Codd: I may say, sir, for your information and that of the jury, that minims are generally understood, technically speaking, to be more than drops. A minim is a measured drop, and, generally speaking, one minim would represent two ordinary drops. So that in this case five minims would represent ten ordinary drops, although in this particular case, I may say, the quantity given was measured.

The Coroner: Was there any opium in the powder?

Mr. Codd: Yes; one-tenth of a grain, to be divided into two doses.

In the course of several other questions, Mr. Codd stated that the administering of opium to children was largely adopted by the medical profession, and in fact was positively recommended by some of the ablest authorities of the profession. Any disapproval of such administration was therefore only a matter of opinion.

This concluded the evidence, and the Coroner, in summing up, quoted a standard medical authority showing that a judicious administration of opium to infants in certain cases was sanctioned, approved, and even recommended.

The Jury retired for a few moments, and on returning to the Court the foreman said: "The jury are unanimously of opinion that the child died from natural causes; and at the same time they are unanimous in expressing the opinion that Mr. Codd is relieved from the slightest blame in this matter."—*Devonport Independent.*

THE SALE OF "SOOTHING POWDERS."

On Tuesday, September 4, the Coroner for Liverpool held an inquest at the Police Buildings, touching the death of Ann O'Neill, five months old. The child was taken ill on the night of the 23rd of August, and vomited. On the following morning the mother took her to a chemist, in Brownlow Hill, who expressed the opinion that she was teething, and gave the mother one of Steedman's soothing powders, with instructions to administer half of it at a time. The mother gave the child one half of the powder. The child afterwards became worse, and the mother took her to the Children's Infirmary, where she died the same evening.

Mr. Henry Gorst, surgeon, who attended the deceased at the infirmary, stated that when the child was received by him she was in a very drowsy state; the colour of the skin was blue, and the pupils of her eyes were contracted. The child was dying. In company with Dr. Londes and Dr. Chalmers he had made a *post-mortem* examination of the remains. The immediate cause of death was congestion of the brain, which might have been from natural causes, though the appearances were rather the other way. He did not think the administration of half the powder was in any way responsible for the death of the deceased. It was not calculated to lead to congestion of the brain; its effect would rather be in the opposite direction. He could not say with certainty how the congestion was set up.

Dr. Campbell Brown stated that he had analysed the stomach of the deceased, and the portion of the powder which was not given to her. The powder contained when entire from 1 to 1·2 grains of calomel, together with a little sugar and a few minute particles of some organic substance which was not morphia. He did not know what these particles were, but they were not injurious so far as he knew; the quantity was too small to be so. The stomach was nearly empty, vomiting having taken place. It contained only about a teaspoonful of digested thick liquid, and in that he did not find any poison. Opium he did not expect to discover, and the mercury, which he did expect to find, had evidently been removed by vomiting. An ordinarily healthy child would not be injured by the half powder administered to the deceased; but if the child was in a dying state it might have had an effect it would not ordinarily have. He did not think the administration of the half powder had any relation to the congestion. It was possible under some circumstances it might cause blueness of the body. He could not associate the child's sleepiness with the taking of the powder. He looked for opiates, and found no trace in the powder or the stomach; but opiates soon passed away.

The Coroner asked Dr. Brown what his opinion was as to the sale of these powders.

Dr. Brown said it was an improper thing to sell poisons without declaring that they were poisons.

The Coroner: But do the people in the profession never do it?

Dr. Brown: They are prescribed by medical men, but this powder, which contains poison, is sold by an unskilled person simply as "Steedman's Powder." I do not blame the chemist; but I think it is an improper thing that chemists should be induced to prescribe what they know nothing about simply because it is sold under a Government stamp. This powder is sold under a three-halfpenny stamp as a secret nostrum. If it was a patent we should know what it contained. It is simply a poison sold without the poison label upon it. If it was sold by a druggist without the stamp it would have to be sold with a poison label upon it.

A verdict was returned to the effect that the deceased died from congestion of the brain, but how it was caused there was not sufficient evidence to show.

Review.

JAHRESBERICHT ÜBER DIE FORTSCHRITTE DER PHARMACOGNOSIE, PHARMACIE UND TOXICOLOGIE. Herausgegeben von DR. G. DRAGENDORFF. 10 Jahrgang. 1875. Gottingen: Vandenhoeck and Ruprecht. 1876.

The English-speaking pharmacists of Great Britain and of the United States are both now provided, by associated effort, with annual reports on the progress of pharmacy, in the shape of the well-known 'Year-Book' issued by the British Pharmaceutical Conference in the one country, and the report issued in connection with the proceedings of the American Pharmaceutical Association in the other. The corresponding French and German reports are still, however, the work of private enterprise, and so far as can be judged by appearances in the case of France this has not conduced to its vitality. But the Yearly Report upon the Progress of Pharmacognosy, Pharmacy, and Toxicology, in the German language, edited by Dr. Dragendorff, of Dorpat, may fairly claim to very high, if not the highest, rank amongst its competitors.

The 'Jahresbericht' is a volume of 500 large octavo pages, and in its compilation the editor has had the assistance of several gentlemen in the collation of the pharmaceutical literature not only of Germany, France, England, and the United States, but also of Poland, Hungary, Belgium, etc. With this help very little worthy of notice has been overlooked, and the number of articles quoted is very large. It may be mentioned, as an instance of the thoroughness of the work, that the first section, which is devoted to "Literature," contains a list of no less than 324 books and pamphlets on subjects connected with pharmacy and the allied sciences published in different countries during the year. It will be surprising to many to learn that a book on a subject connected with pharmacy is published on the average on every working day of the year.

The method adopted with the quotations is almost without exception to give more or less condensed abstracts from the original articles, but always sufficiently full and clear to indicate their scope. These are arranged upon a definite system that is closely followed throughout, so that all that is to be said on a particular subject is as a rule brought close together. Of course difficulties must have been met with in carrying out the plan but they have been admirably overcome. It may be of interest to sketch briefly the order of arrangement followed.

Part I., as above mentioned, contains a list of works published during the year, to which are appended a few editorial remarks upon the most noteworthy.

Part II. deals with papers having general relations to pharmacy, such as sketches of the condition of pharmacy in, and the materia medica of particular countries.

Part III., Pharmacognosy, is subdivided into (*a*) Pharmacognosy of the Vegetable Kingdom, in which the vegetable materia medica is classed under the natural orders; and (*b*) Pharmacognosy of the Animal Kingdom, similarly arranged. The articles in this section are limited to those referring to the unmanufactured drug. Thus under Rubiaceæ are given notices on the cultivation of cinchona, the testing of cinchona bark, etc., and similar information with respect to opium is given under Papaveraceæ, but papers on quinine, morphia, etc., are referred to a subdivision, "Alkaloids," of the next section.

Part IV., Pharmaceutical Chemistry, is divided into (*a*) General Matters; (*b*) Apparatus and Manipulations; (*c*) Special Pharmaceutical Chemistry. This last division is again subdivided into the Metalloids, Metals, and Carbon and its Compounds (including alcohols, ethers, sugars, acids, alkaloids, etc.).

Part V. is devoted to Practical Pharmacy, one subdivision of which contains information respecting advertised nostrums, some of which, however, is more curious than correct, as, for instance, the statement that Steedman's powders consist only of rice starch.

Part VI. relates to Toxicology and Judicial Chemistry.

A copious index of authors and another of subjects are supplied. Those who are conversant with foreign literature of this kind must have noticed the havoc frequently played with the orthography of authors' names. From this failing the present work is remarkably free, but it does afford one amusing instance. In quoting the name of a contributor to this Journal, Tichborne is transformed into Titchborne; in the Corrigenda this name undergoes further mutilation and is "corrected" to Tischborne.

From what has been said it will be seen that Professor Dragendorff's book will be an acquisition to the bookshelf of any pharmacist who can read German.

Dispensing Memoranda.

We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be conidered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.

[16]. Pulv. Capsici.—Referring to your remarks on and W.'s reply to above, the difficulty, of course, lay with the quantity of capsicum, and the history is as follows:—The prescription was presented to the writer's firm to be dispensed on the evening of Saturday, 30th June last, when we arrived at the conclusion that it was the intention of the prescriber to define the quantity of *pulv. capsici*, and order *q. s.* of some other ingredient. There was a lotion on the same prescription which we dispensed that evening; the pills, under the plea of taking some time to prepare, we held back till the Monday in order to obtain time to communicate per post with the prescriber—whose handwriting was quite familiar to us—a lecturer on a special subject in connection with a university of a neighbouring city. In our communication to him we called attention to the pulv. capsici; in his reply he says, "the prescription is quite correct, of course you will require to use some medium as an excipient." We then dispensed the pills with pulv. capsici gr. vj., and made the mass with jelly of glycerine and tragacanth. They have been repeated. I may add we hold the original prescription and prescriber's reply.

M.

[21]. Apothecaries' or Avoirdupois?—The sign ℥j is simply an abbreviation for one ounce old apothecaries' weight, viz., 480 grs., and must of course be dispensed accordingly. The writer of the prescription has ignored the B.P. in this particular, perhaps intentionally, wishing to give an even number of grains in each dose.

E. Samson.

[22]. Keeping Leeches.—I have read with interest the letters on the above subject in your Journal of last week. Permit me to state my own plan, for many years acted on with success. 1st, The leeches are placed in a glass receptacle; a very wide-mouthed bottle such as used by confectioners will suffice. 2nd, Pebbles are put therein. 3rd, The bottle about two-thirds filled with our reservoir water is kept near the shop window where there is light and sun. 4th, The water is very rarely changed, only when appearing somewhat turbid or for the sake of cleaning the bottle. 5th, The top of the bottle is covered over with common bunting. I would observe from my own experience the chief care should be *not* to change the water, as generally recommended, *often*, and light and pebbles should never be forgotten.

Samuel Thornton.

[22]. Keeping Leeches.—Never change the water, unless obliged to do so, and always put the fresh arrivals into a jar of well-seasoned water; I always keep a second vessel in hand and find the longer it has been standing the healthier the leeches are. By putting them into fresh, spring, or other water you simply starve them; the same holds good of changing the water. I, of course, at one time followed the beaten track and killed my leeches by the score; now I rarely lose one.

J. Slade.

[22]. Keeping Leeches.—In answer to query 22 I have kept leeches for several years in large and small quantities and have always noticed that the more elaborate the aquarium the shorter lived were its contents. I have found this to be the case with regard to gold and other fish, as well as with leeches. I keep my leeches in a tin can, such as is used for carrying live fish, bait, etc., and may be bought for one shilling; I place a piece of muslin under the cover to prevent them injuring themselves against the perforations of the lid, and keep the whole arrangement in the open air. I seldom lose one by death, and whilst reading through the letters in volume vi. (to which you directed attention), it struck me that my success was perhaps due to the fact that the tin in which I keep them is more or less rusty.

[22]. Keeping Leeches.—In reply to Mr. Hoddinott, I should like to give the method which I have followed for nearly two years and in which time I have lost only five leeches. I have a twelve inch leech aquarium, which holds, when two-thirds full, about two and a-half gallons of water (river). I keep in it twenty-five leeches, three trumpet snails, and five small gold fishes. During very warm weather the water is changed twice a week, at the present time once, and during winter once in three weeks. The leeches are gently rubbed with a sponge kept for the purpose every time the water is changed. They are kept in full light near the window. I would add that the less they are interfered with the better.

Hirudines.

[23]. How should the two following prescriptions be made up so that there shall be no deposit of resin on sides of bottle?:—

℞ Tinct. Myrrh		℥ss.
Alum		gr. cxx.
Aq. Rosm.	ad	℥8.
Misce. Ft. garg.		

℞ Tinct. Guaiaci Ammon.		℥ss.
Potsss. Chlor.		ʒj.
Aquæ	ad	℥8.

Merens.

[24]. PILL COATINGS.—Can any one inform me of a method for sugar coating (or white coating) pills that will bear comparison with that adopted by manufacturers? I have tried those already recommended in the Journal, but do not find them at all satisfactory.

AGENDA.

[25]. EMP. CANTHARIDES.—When emp. canth. is ordered to be spread, is it correct to paint the surface with a vesicating liquid?

W.

[26]. UNG. HYOSCYAMI.—I should be much obliged if some one would kindly tell me how the above is made. I have met with it this week for the first time.

E. BEVAN.

Correction.—In the answer of W. to No. 17, on p. 159, read scruples instead of drachms for the first two ingredients.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

"CASTOR OIL PILLS."

Sir,—The recent absurd prosecutions have given rise to several suggestions for a label so worded as to meet the case and have as yet failed. The explanatory one suggested last week would take too much space, especially if a small label were required, and of course it would have to be on all alike. For some time past I have had my labels printed thus, "Compound Castor Oil Pills," the addition has never been questioned or remarked on by the public, and at the same time it implies that castor oil is not the only ingredient. A small quantity will substantiate the name.

B. T. KIMBER.

London, September 4, 1877.

Sir,—On the vexed question of castor oil pills I have found that customers do not as a rule imagine that the pills are made of castor oil, but that they can be taken instead of castor oil. I have found that in exceptional cases I have had to explain that the name arises from the above custom. My rule now is to say, "These pills are not castor oil, but taken instead of castor oil." I think Mr. Gardner's label too long for a penny box of pills. I annex a few popular names for pills here—

Wake-me-ups.	Castor oil pills.
Rattlers.	Five o'clockers.
Eye openers.	Fly-away-jacks.
Scavengers.	Imperial pills, and
Early risers.	Excavators.

All meaning a common purgative pill.

G. H. WRIGHT.

103, *Boro' High Street.*

COUNTER PRACTICE.

Sir,—I cordially agree with the remarks contained in Mr. Postans' letter in reference to counter practice.

Very many young men after the completion of their apprenticeship take situations as dispensers with medical men until they are able to commence business as chemists for themselves; manifestly they must acquire a certain amount of medical knowledge, and should their business be in a country town where a medical practitioner may not be always accessible, surely for such trifling ailments as a slight cold, sore throat, or disarrangement of the system from diarrhœa, induced by partaking of unripe or overripe fruit, a duly qualified chemist who has passed the examinations of the Pharmaceutical Society is fully competent to prescribe such simple remedies as will at once and effectually give relief.

Medical men are obliged to leave their practice occasionally for needful rest and relaxation; many cases then often come under the notice of a chemist and druggist, requiring simple treatment, which he is fully qualified to deal with by some simple common-sense prescription, and how often does he in his practice dispense many high-class prescriptions of some of our most eminent physicians. I think, then, that where a chemist does not trench upon the practice of a medical man by presuming to treat a serious and complicated case, he may be safely trusted to prescribe over the counter for such slight ailments for which he is often asked to give a remedy.

A CHEMIST OF THIRTY-TWO YEARS' STANDING,
WESTERN DISTRICT.

MEDICINAL USES OF COSTUS.

In addition to the native uses of this drug in China, already quoted from my 'Contributions' by Mr. Cooke, I may add that the root, when cut up in that fine state of "rasps" so admirably done by the Chinese druggists, is a capital remedy for the opium smokers anxious to give up the drug (a watery extract of opium mixed with the ash of the opium pipe). The rasped root should be mixed with the ash just alluded to, or with weak tobacco, and smoked when the "craving" comes on. This, combined with the use of ammoniated tincture of valerian, tincture of nux vomica, tincture of capsicum, and tincture of sumbul, will often effect a cure. The tincture of henbane with bromide of potassium or bromide of ammonium (better still), at night only, should be given in bad cases. I am led to make these remarks as there are several "opium dens" in London.

F. PORTER SMITH,
Hon. Mem. Pharmaceutical Society of Great Britain.

Shepton Mallet, August 30, 1877.

G. A. Watt.—Sassafras nuts (*Nectandra Puchury*).

R. H. Davies.—*Eryngium maritimum.*

J. S. Whyte.—*Odontites rubra* and *Vicia hirsuta.*

J. Epps.—Thanks for the white-flowered specimen of *Betonica officinalis.*

D. G. Taaffe.—We do not profess to possess any special aptitude for construing the Pharmacy Act (Ireland), but it seems clear that the fact of a person becoming a pharmaceutical chemist under its provisions does not warrant him in suggesting in any way that he is an apothecary.

T. G. H.—The answer would probably depend upon the terms of your indenture. Consult your friends.

"*An Assistant*" is recommended to communicate with the Secretary to the Assistants' Association.

G. P. W.—The accusative is quite correct, "aquam" being the direct object of the verb, unless q. s. be understood.

S. T. S.—The words appear to be, "Seeds of the American White Elm, with drooping branch."

A. E. Ekins.—Evaporate the liquor and fuse the residue with carbonate of sodium.

H. W. Harris.—(1) We are unable to furnish you with the form asked for. (2) The presence of the alkaloid solania in the tomato, together with fixed oil, gum, chlorophyll and inorganic salts has been determined by Kennedy. (See *Pharm. Journ.*, Feb. 1, 1873, p. 606.)

"*Subscriber.*"—We cannot suggest any method of freeing your pigeon cote from bugs if washings and fumigations have been found useless.

"*Kure.*"—Boil the ingredients and stir well.

Mr. Brevitt and Mr. Abraham are thanked for their communications.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Doll, Davies, Davy, Welborn, Balkwill, Chipperfield, Reynolds, Barnaby, Smith, Rowe, Morell, Martin, Fox, Adcock, Mumbray, Negator, Omega, Syrupus.

A NEW METHOD OF DETECTING ALCOHOL, WHEN USED AS AN ADULTERANT OF THE ESSENTIAL OILS.

BY EDMUND W. DAVY, A.M., M.D., M.R.I.A.,

Professor of Forensic Medicine in the Royal College of Surgeons, Ireland.

It is well known that one of the most frequent of the adulterants of the essential or volatile oils, at least of those that are the more expensive, is alcohol; this being the case, at the suggestion of my friend Mr. Charles Tichborne, I made some experiments on the application of my molybdenum test for alcohol to the detection of that substance when used for such adulteration, and finding that it might be usefully employed for this purpose, I brought the matter under the notice of the Pharmaceutical Society of Ireland, at its meeting in last April. A number of circumstances, however, prevented me from publishing before this my communication on that subject.

Having briefly described the molybdenum test for alcohol, which was published last year in the *Pharmaceutical Journal, Chemical News*, and in other scientific periodicals, I pointed out how it afforded a very ready means for the detection of alcohol in the essential or volatile oils, it being only necessary to agitate a little of the oil under examination with a small quantity of distilled water, and having allowed the mixture to stand for a short time till the oil and water have again separated, to take a drop or two of the watery portion and add to it three or four drops of a solution of molybdic acid in strong sulphuric acid, when the characteristic blue reaction will appear if alcohol be present. The following very simple way I adopted in applying this test to the essential oils:—A glass tube of about four inches in length and of about a quarter of an inch in diameter in its internal bore was taken, one end of which being heated was drawn out to a point, and closed so as still to leave a very small hole, whilst the edges of the other end were merely rounded by fusion,* and to this latter was adapted a sound well fitting cork or better still, an India rubber stopper capable of closing the aperture perfectly air tight. The small hole being closed by one of the fingers placed firmly against it, the tube is filled to about one third† of its contents with distilled water, and then about an equal volume of the essential oil added. The larger end of the tube is now to be tightly closed with the cork or stopper, the finger being still kept on the small hole, and the contents of the tube is then strongly agitated for a few moments; after which the pointed end is turned upwards and the finger removed, to allow the air condensed by the closing of the larger end to escape so as to avoid unnecessary loss of the mixture; and finally the tube being again reversed, it is supported on a stand with its pointed end downwards, but not resting on it. In this upright position it is left till the oil has separated from the water and risen to its surface, which in most cases takes place in a comparatively short time, leaving the aqueous portion below quite clear or very nearly so. When such is the case a drop or two of this portion is allowed to escape, which is easily effected, either by pressure on the cork or stopper, by holding the upper part of the tube in the hand so that its warmth may expand the contained air, or by slightly drawing out the cork (which will cause some air to enter at the pointed end) and then pressing it in again; by one or other of those simple means, the necessary quantity of the aqueous portion will be easily forced out of the tube. This on being brought into contact with three or four drops of the molybdic solution placed in a little porcelain capsule or on any white porcelain or delf surface, will, if the oil has been adulterated with alcohol, develop after a few moments the characteristic intense blue reaction of that substance.

The molybdic solution I have employed for this purpose was the same as that which I have already recommended to be used in the adoption of my test for the detection of alcohol generally, which is readily prepared by dissolving, with the aid of a gentle heat, one part of molybdic acid in ten parts by weight of pure and concentrated sulphuric acid. This solution should be kept in a well-stoppered glass bottle, as it quickly absorbs moisture, becoming too dilute, and is otherwise injured if it is left exposed to the air.

As regards the little testing tube I have suggested for the examination of the essential oils, I may observe that if it is properly constructed and corked perfectly air-tight, it will hold its contents without allowing it to drop out when not required; and if the pointed end of the tube is not left touching any object, which would withdraw the fluid by capillary attraction, there will only be a very trifling loss of the watery portion from evaporation through the small aperture, even after keeping for a considerable time.

The experiments I have made on a number of the essential oils,* which were apparently pure, or at least were unadulterated with alcohol, show that if they are agitated with distilled water, and after they have again separated from it a drop or two of the watery portion be taken and tested in the manner already described, there will either be no change of colour observable, or, what is more frequently the case, there will be a faint light-brown or yellowish-brown tint produced, or lastly, in some few instances a light olive or grey is developed, quickly changing to the former tints, all of which soon fade away leaving the mixtures colourless or very nearly so. But if the oil is adulterated with alcohol, the water dissolving out that substance, a drop or two of the aqueous portion develops with the test solution, after a few moments, the deep azure-blue coloration which is so characteristic of that substance, and this is much more permanent, generally speaking, than

* Several tubes suitable for this purpose may be easily made by selecting a tube of rather soft glass, not too thin in its substance and of about the bore stated, and having with a spirit lamp or by means of gas drawn it out to a fine bore at intervals of about eight or nine inches apart, the tube is cut with a file, both at the centres of contraction and of the intervals between them, and finally the edges of the larger end of each tube rounded and of the smaller one closed to a fine point by fusion.

† In cases where the degree of adulteration may be small, it will be well to diminish the proportion of the water employed so as not to dilute the adulterant too much; and where the very expensive oils are the subject of examination, smaller sized tubes than those recommended may be employed.

* The following were the essential oils experimented on: otto of roses, rose geranium, neroli, neroli petit grain, santal wood, rhodium, patchouly, bergamot, verbena, lavender, rosemary, cinnamon, bitter almonds, lemon, bitter orange, cloves, caraway, peppermint, nutmeg, mustard, anise, fennel, cajuput, cubebs, juniper, turpentine.

the shades of colour caused by the essential oils alone when so treated, though even this, as in their case, will fade away leaving the mixture colourless, or very nearly so, after a shorter or longer exposure to the air. If the amount of alcohol present be considerable the blue effect will be produced after a few moments, even at the ordinary temperature, but where the quantity is very small I have found that the application of a very gentle heat renders the test far more sensitive.

As, however, I have ascertained that a heat of 212° Fahrenheit, and in some cases a temperature even considerably below that point, especially if continued for some time, will develop a more or less blue coloration with the water which has been agitated along with essential oils apparently pure, when it reacts on the molybdic solution, some caution must be observed in the application of heat.

It appears, however, from my experiments with the essential oils I have operated on, that the water so treated and then allowed to separate from them, as in this method of testing, might be heated with the molybdic solution to 120° Fahr. on a water-bath, without developing a blue coloration, at least, unless that heat is continued for a considerable time, though such a comparatively low degree of heat is quite sufficient to develop, almost immediately, the blue reaction if alcohol be present. But owing to heat acting in the manner described, I would recommend the test to be at first applied at the ordinary temperature, and if it fails to indicate the presence of alcohol it shows that either the oil is free from that substance, or if any is present the quantity must be extremely minute, and if the latter is the case it may be readily detected by slightly warming the mixture, taking care, however, that the heat should not rise much beyond 120° Fahr., which, if it occurred, would create some uncertainty as to the cause of the blue reaction.

By means of this test I have ascertained that several samples of otto of roses sold to me as genuine were adulterated with more or less alcohol, and that a sample of rose geranium oil lately in the market, which was assured to Mr. Tichborne as being a genuine article and one of superior quality, was very largely adulterated with alcohol. From several experiments I have made with the more expensive essential oils, mixing them with different proportions of alcohol, I found that where they were mixed with one twenty-fifth, one fiftieth, or even with one hundredth part of their volume of rectified spirit of wine, that its presence could readily be detected by this test, and I have no doubt but that it is capable of detecting much smaller proportions of that substance should it be present as an adulterant in different essential oils.

I should observe, that where the oil from its density will not rise readily to the surface of the water after agitation, as occurs with a few of the volatile oils, this difficulty I have found may be readily overcome by adding to the contents of the tube a little sulphate of magnesia, which, dissolving in the water and increasing its density, will if employed in sufficient quantity, cause the oil to rise to the surface, leaving the watery portion below clear and suitable for testing with the molybdic solution.

Before concluding I should also remark that the oils themselves must not be added directly to the test solution, for I find that many of them when so treated after passing rapidly through various shades develop a deep blue even though they are apparently pure, and those that do not produce that colour give rise to such dark shades of brown, olive, or black, as to mask more or less completely any blue coloration which might be caused by admixture with alcohol.

The same I found to be the case to a great extent, though acting more slowly, when the test solution in a capsule was placed under a small bell glass and exposed for some time to the vapour of different essential oils emanating from cotton wadding on which they had been dropped, or from a little vessel containing them. In some few instances, however, by using the test in this way, it enabled me to distinguish very quickly the pure oil from the same kind which had been mixed with a minute quantity of alcohol, and it may, therefore, in some cases be of use in detecting such adulteration, or at least in distinguishing differences in various samples of the same description of oil; but I found that this way of employing the test, though much simpler, was not so generally applicable, nor so trustworthy in its indications, as the method already described.

FRENCH LACTUCARIUM.

The principal if not the sole producer of lactucarium in France is Mr. Aubergier, of Clermond-Ferrand in Auvergne, Department Puy-de-Dôme, whose researches on the chemistry and therapeutics of this drug are well known to pharmacists. His first experiments, which were made previous to 1841, were chiefly directed to the selection of the proper variety of lettuce, so as to obtain the largest possible yield of lactucarium. As a result of his investigations he began the cultivation of *Lactuca altissima*, Bieb., a native of the Caucasus, which is a gigantic herb (hence called *laitue gigantesque*), having, when cultivated, a height of 9 feet, and a stem $1\frac{1}{2}$ inches in diameter.* The manner of collecting the juice differs from that pursued in Germany or Scotland; instead of cutting off the stem near the top, and removing successive slices every day, transverse incisions are daily made at the time of flowering, into the stem from above downward, and the juice which flows from them is collected in a glass vessel. By the time this is full, the juice has coagulated and is removed, after which it is shaped into circular cakes of $1\frac{1}{2}$ inches in diameter, which are dried by exposure to the air upon sieves.

While it was found, in the commencement of the enterprise, that one person could collect at most 60 grammes of the juice per day, Mr. Aubergier has succeeded in training his employés—and he employs only women for this purpose—so well, that the mean daily quantity collected by one person now amounts to about 600 grammes (about 1 lb. 5 oz.), while some very active workers occasionally gather as much as one kilogramme. This activity and skill is stimulated by premiums, which are given for any quantity returned above 300 grammes, and further by a sort of co-operative partnership, the most expert workers receiving at the end of the season some extra gratuities proportionate with the total yield. Dry seasons are very unfavourable to a large yield; and in order to be able to supply the demand, Mr. Auberger, takes advantage of moist seasons to lay in a large supply, sufficient to last for several years ahead.—*New Remedies from La Ruche Pharm.*, 1877, 21.

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* Prof. G. Planchon believes it to be a mere variety of *Lactuca Scariola*, L. See 'Pharmacographia,' p. 354.

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 15, 1877.

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ORGANIZATION OF PROFESSIONAL CHEMISTS.

A TIME ago, in course of some observations upon the Institute of Chemistry, a sort of opposition exhibited by a contemporary, and a few of the public analysts represented by it, was characterized in this Journal as being probably "a pitiful wail against inner consciousness and outward circumstance." These oppositionists appear to suspect that they will be refused admission as members of the Institute, and manifest their fear in a manner which irresistibly reminds one of the famous French proverb, "Qui s'excuse s'accuse." Leaving out of consideration any reasons which may justify such an apprehension—for, apart from the despairing gentlemen who make the complaint, they are unknown—we yet felt justified in describing the opposition as being as spiritless as it would probably prove futile.

More recently the *Analyst* has given some explanation of its conduct, but the explanation is as incomprehensible and unmeaning as the opposition to which it refers.

It is not worth while perhaps to follow the *Analyst* throughout its latest protest; were it so it would be easy to refute everything in it that partakes of the nature of an argument based upon reasonable grounds. The fact is, that journal has acquired, somehow or another, a partial knowledge of the transactions relative to the formation of the professional institute, while it jumps at conclusions regarding its function and future. The *Analyst* grants that the committee of fifty, which had the care of the child institute, was an able body—the "most clever, most competent, and most successful chemists in the country," but, at the same time, it asserts, and has indeed "asserted from the first," that these promoters of organization among chemists are unable to discriminate between competent and incompetent ones. This may be true, but such a discrimination forms no part of the duty of any council or committee attached to the Institute of Chemistry. What has to be determined when the time comes will be this: Are the qualifications presented by candidates for membership such as entitle them to election? The *Analyst* is apparently unacquainted with the just and proper means which will be adopted in order to ensure a just appreciation of merits and qualifications, but that this will be done is as certain as that the promoters are the "most clever, most competent, and most successful chemists in the country." If the *Analyst* would but be candid and speak out, it would, in our opinion, say of the Institute, "Everything would be quite right, and no mistake would be possible in the future, if we had only been chosen to assist in the labours of promoting the organization of chemists; you have made a mistake in the past by ignoring us; please take us in and we will say no more about it!"

Nevertheless, the funny article in the *Analyst* is not without merit. It incidentally raises the question, What is a professional chemist? We remember hearing a solicitor answer this question on one occasion with the reply, "A professional chemist is a man who will swear to anything you like for a five pound note." It is towards the removal of this definition and the substitution of a better and more honourable one that the efforts of the new Institute must be directed.

The *Analyst* defines a professional chemist as a man who earns an income "purely by the practice of professional chemistry as distinguished from pharmacy." Why distinguished from pharmacy more than anything else which is outside the pale of professional chemistry, we do not know. The term professional chemistry is used to distinguish it from chemical investigation, and even this diagnosis is almost unnecessary, because no one earns an income by the prosecution of research in the domain of pure science, and very often professional practice involves research though the results may be published in the usual way. The *Analyst's* definition is moreover unsatisfactory, because there is scarcely a man in all England who earns an income purely by the practice of professional chemistry.

The profession of chemistry when properly administered has a purpose as useful and noble as any comprehended by medicine, the law or the church. This purpose will increase and intensify with the progress of the age. Science—and chemical science in particular—already influences and penetrates the minds of nations, and as it must inevitably become more and more an essential part of the machinery of the times, the machinery by which nations progress, so its administration and fulfilment must be adequately performed and carried out.

Those who in the present day consider themselves professional chemists, or rather those who will advance claims to be admitted as members of the new Institute, present a motley group. First of all there are those gentlemen who pursue science as a profession, and who exercise it in a manner comparable to that in which solicitors do their business—eminently well and eminently respectably. Then there are teachers of chemistry, including men who hold professorships, lectureships, and so forth, many of whom eke out an income by taking professional work, when and where they can get it. Again, there are public analysts, of whom of course some are included in the first group already described, but of whom others are —well—only public analysts. Finally, there are a host of unknown nobodies, assistants, men who have bought degrees, and nonentities of all sorts, all of whom will accept analytical and other work as often as they can obtain it.

Among these classes of practitioners are men who can do their duties properly; others who can do them imperfectly; and, yet again, others who cannot do them at all, and therefore get them done by proxy, or what is still more disgraceful, "arrive at results."

Therefore organization is required. At first it must and will be, wide, liberal, and comprehensive; it cannot be otherwise at starting if it is to succeed. Even doubtful men must be admitted to the Institute, and will be admitted. To time and development must be left the processes of weeding out and survival of the fittest, and in the meantime a proper training for the coming generation of professional chemists may be devised, and a standard of competency and honour adopted, which shall be to every aspirant the goal at which he aims—the object he seeks to attain.

The *Analyst* may dry its eyes; its wound is poignant, but it is not beyond the power of healing.

CRUEL INDIFFERENCE.

According to the journal which boasts of having the largest circulation in the world an incident occurred at a recent meeting of a suburban board of works which manifested either a cruel indifference to the safety of the constituents of the Board, or an almost equally cruel contempt for the opinion of one of its officers. It appears that the public analyst reported that a large quantity of treacle containing arsenic had found its way into the market and was being extensively sold. Already, so the analyst had read or heard, two families had been poisoned by the stuff, and he advised the board to obtain samples from every seller of treacle in the district. This reasonable suggestion was objected to on the ground of the expense that would be involved in the purchase of one hundred samples, and eventually it was decided that only two samples from each parish in the district should be purchased. Probably these will not represent ten per cent. of the treacle sellers in the district, and what an amount of arsenical treacle might not be dealt out by the remainder. Can it be that the board would not spend one hundred pence to avoid so fearful a risk? Did the board think the analyst had found a mare's-nest? Or was there any other reason that limited the inflow of "golden syrup" into the laboratory? We shall look forward with interest to the report on the samples purchased, as an arsenical treacle scare, although it might affect the treacle trade adversely, would be a real "god-send" to a certain class of public analysts, now that castor oil pills devoid of castor oil and soda water without soda have lost their novelty.

By the way, one of the few surprises we have met with during the dead season has been in connection with this "soda water" question. Our contemporary the *Medical Press and Circular*, which has hitherto been more consistent than sensible in its denunciations of the selling of articles under popular names that do not represent their true composition, evidently feels it must draw the line somewhere, and the journal that could not see with equanimity the application of the name "citrate of magnesia" to an article popularly known as such would tolerate the sale of soda water without soda. The reason given is that "soda water" is evidently a misnomer, but can hardly be said to be a deception, for most people know that the beverage so called contains usually no soda, and that it is not the worse for the omission and would be bought as readily under any other name (and, we may add, would probably "smell as sweet"). Our contemporary continues, alluding to a recent indictment for such a sale, that "if analysts aim at disgusting the public with the law they can do so no more effectually than by *prosecuting inoffensive traders for technical offences.*" We are not disposed to quarrel with this opinion, but it is curious that this sudden development of common sense is coincident with what is generally known as the "silly season." What can be the explanation?

ANOTHER MYSTERIOUS TREE.

In a recent number we quoted from a report made by one of Her Majesty's Consuls respecting a marvellous tree, suggestive of the saying, "*Omne ignotum pro mirifico est.*" This account can now be paralleled with another from a consul of the Columbian Government, who reports that in the woods near Moyobamba, in northern Peru, there grows a tree which has the property of absorbing an immense amount of humidity from the atmosphere and subsequently pouring it forth from its leaves and branches in such an abundant shower as to convert the ground in its neighbourhood into a bog. The tree is appropriately called "*tamia-caspi*," or "rain tree," by the natives, and is said, when mature, to attain a height of fifty feet, and a diameter of three feet at the base. It is only what might be expected to learn that this curious property is manifested in its greatest degree in summer time, when rivers are low and water is scarce. It cannot be said that these consular reports contribute much to our scientific knowledge of these vegetable wonders.

FATAL MISTAKE IN A FRENCH PHARMACY.

A Toulouse pharmacien has recently been sentenced to one month's imprisonment, and his wife to three days' imprisonment, for having prepared a draught with arsenious acid instead of phosphate of lime. The mistake cost the life of the patient.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

(*Continued from page* 194.)

The next paper read was a report on the Proximate Constituents of Ivy Berries, by R. H. Davies.

THE CONSTITUENTS OF THE IVY—"HEDERIC ACID."

BY ROBT. H. DAVIES, F.C.S.

At last year's Conference in Glasgow, I had the honour, in conjunction with Mr. C. H. Hutchinson, of reading a paper in which some of the leading characters of so-called hederic acid were mentioned. Some little additional work having been done upon this substance during the past year, I proceed to report upon it. As already stated, so-called hederic acid consists solely of carbon, hydrogen and oxygen. Three analyses have already been published of this body—two in 1849 by Professor Posselt, to whom we owe its discovery, and one in April, 1875, in Dr. Hartsen's paper on "A New Substance in Ivy Leaves." This new substance I last year showed to be identical with Posselt's hederic acid.

I have found it exceedingly difficult to burn "hederic acid" completely by the ordinary combustion process. When oxide of copper is employed I have never succeeded in converting the whole of the carbon into CO_2. With chromate of lead better results have been obtained, but the method finally adopted was to mix the substance with a mixture of chromate of lead and bichromate of potassium in a tube, the fore part of which for 6 or 7 inches was filled with dry copper oxide. By this means I have obtained results which compare favourably with those obtained by burning the weighed substance mixed with granular oxide of copper in a stream of oxygen. The substance lost Exp. *a* 4·87 per cent., Exp. *b* 4·77 per cent. of water at 100° C.; mean of the two 4·82 per cent.

Exp. 1. 0·1729 gram of the dry substance taken yielded 0·4304 gram CO_2, and 0·1452 gram H_2O.

Exp. 2. 0·1546 gram yielded 0·3818 gram CO_2 and 0·1287 gram H_2O.

Exp. 3. 0·309 gram yielded 0·7712 gram CO_2 and 0·2548 gram H_2O.

In these three experiments the substance was burned, mixed with granular copper oxide in oxygen.

Exp. 4. 0·1532 gram "hederic acid" yielded 0·3787 gram CO_2, and 0·1268 gram H_2O.

Exp. 5. 0·1628 gram yielded 0·4037 gram CO_2 and 0·1382 gram H_2O.

In these two experiments the mixture of chromates was resorted to for the combustion.

The formula $C_{16}H_{26}O_4$ would require 68·08 per cent. carbon and 9·22 per cent. hydrogen.

The foregoing experiments indicate the following percentages:

	I	II	III	IV	V	Average	Theory for $C_{16}H_{26}O_4$
Carbon	67·88	67·37	68·03	67·41	67·63	67·66	68·08
Hydrogen	9·33	9·24	9·16	9·19	9·43	9·27	9·22
Oxygen (by difference	22·79	23·39	22·81	23·40	22·94	23·07	22·70
	100·00	100·00	100·00	100·00	100·00	100·00	100·00

The percentage of carbon is greater in every case than was obtained by either of the experimenters before alluded to,* an error on their part which I think due to the difficulty of completely burning the substance. Neither of them attempted to deduce a formula from the percentages he obtained.

Attempts to produce salts of barium, calcium, potassium, sodium, aluminum, copper, and silver, have been attended with uniformly negative results; and I have no reason to doubt that my former statement that this substance is not an acid is correct. An ammonium compound has been produced, but the amount of ammonia contained is so small as to preclude the probability of its being an ordinary salt. It is now under investigation.

A lead compound of "hederic acid" may be formed by mixing alcoholic solutions of "hederic acid" and lead acetate, but the difficulty of purifying it has hitherto prevented my making an analysis. It is noteworthy that the mother liquor in this case is *not* acid, as would be the case if the ordinary double decomposition took place, hederate of lead and acetic acid being formed.

With substitution products I have been more successful. It was stated last year that a probable nitro substitution product had been formed; this has since been prepared and analysed.

It is easily soluble in chloroform, in which "hederic acid" is insoluble, so that it may be purified by making use of this fact. 0·5586 gram of the nitro product dried in air over sulphuric acid yielded 0·0225 gram H_2O at 100° = 4·03 per cent.

Exp. 1. 0·0950 gram of the dry substance yielded 0·2045 gram CO_2 and 0·0691 gram H_2O.

Exp. 2. 0·1916 gram of the dry substance yielded 0·4098 gram CO_2 and 0·1221 gram H_2O.

Exp. 3. 0·2995 gram of the dry substance examined for nitrogen by Dumas' method.

Temperature 21·5° C. Height of barom., 745 mm. Difference in level of mercury, 140 mm. Tension of water vapour, 19·7 mm.

Vol. of nitrogen 15·6 cub. centim. reduced to temp. 0° C. and B. P. 760 mm. = 11·13 c.c. Weight of nitrogen = ·01396.

These numbers in percentages are as follows:—

The formula $C_{16}H_{25}(NO_2)O_4$ requires—

C 58·71 H 7·64 N 4·28 per cent.

	I.	II.	III.	Average.	$C_{16}H_{25}(NO_2)O_4$ requires
Carbon	58·69	58·33		58·51	58·71
Hydrogen	8·08	7·08		7·58	7·64
Nitrogen			4·66	4·66	4·28
Oxygen (by difference).				29·25	29·37
				100·00	100·00

There can, I think, be little doubt that the formula $C_{16}H_{25}(NO_2)O_4$ expresses the composition of this substance, and thus the formula $C_{16}H_{26}O_4$ assigned to the original substance is confirmed.

It seems probable that I shall have another nitro product to report upon, as a substance differing in some particulars from this one is yielded by acting upon "hederic acid" with nitrous anhydride, evolved from a mixture of nitric acid and arsenic; this may turn out to be a nitrosyl derivative.

A bromo derivative has also been obtained, but is not yet analysed.

The results of the destructive distillation of "hederic acid" promise to be interesting. When heated alone, the heat being carefully regulated, charring soon takes place, without any preliminary volatilization, and then the black liquid which is produced gives off dense vapours, which condense to produce what I think is a mixture of two or more fat-like substances, soluble in alcohol and ether, and having a peculiar tarry odour. A small quantity of permanent inflammable gas is also produced. The fatty substances do not react with ordinary reagents in any marked way, but with nitric acid a nitro substance is formed, and precipitated on dilution with water, so

* In Hartsen's paper the numbers are C. 63·44 per cent. H. 10·4 per cent. Posselt gave 66·49 and 66·43 per cent. carbon 9·5 and 9·41 per cent. hydrogen.

that I trust to effect some separation by this mode of operating.

I have retained the name "hederic acid" for convenience, but trust, after some further investigations, to find a name which will more correctly express the constitution of this substance.

I am greatly indebted to Messrs. C. H. Hutchinson and R. H. Parker for the help they have kindly afforded me; to Messrs. Corbyn for preparing the crude hederic acid; and to Professor Attfield for freely permitting the use of the laboratory of the Pharmaceutical Society in this research.

This was followed by a Note on—

Hederic Acid from Ivy Leaves.

BY CHARLES T. KINGZETT, F.C.S.

At the 1876 meeting of the British Pharmaceutical Conference, Messrs. R. H. Davies and C. H. Hutchinson read a communication on the "Chemical Constituents of the Ivy." In that paper certain references were made to former researches upon this subject, but little new matter was brought forward, beyond a further description of the properties of so-called hederic acid, a name given to the substance by Posselt.*

Hederic acid, when pure, is a snow-white powder, insoluble in ether, but soluble in hot alcohol. That specimen which formed the subject of the present paper, was kindly given to the author by Mr. R. H. Davies, and amounted to several grams only. When Mr. Davies read his paper, I then suggested that hederic acid was a body constructed on the type of a saccharide, inasmuch as I had found many bodies of this constitution to give, with strong sulphuric acid, a purple colour, like to that given, as Posselt found, by hederic acid, and because this substance gives on boiling with dilute sulphuric acid, a solution which reduces Fehling's copper test.

Since the time mentioned, I have, in conjunction with my friend, Dr. H. W. Hake, published an account† of a number of new reactions in organic chemistry, similar to the one above described, due to hederic acid, and in the continued prosecution of this study, I have subjected this last-named body to a closer examination.

When heated on platinum foil, hederic acid melts to a colourless oily-like substance, which emits a dense white aromatic and inflammable vapour, and on continuing the heat, the whole of the substance boils away in this manner, leaving no ash and no charcoal.

As already stated, it strikes with strong sulphuric acid a purple colour, which does not form immediately; but this colour is not nearly so intense or so beautiful as that which is immediately formed when a trace of sugar is present, or more faintly when a drop of water is added; further addition of water causes the destruction of this colour.

With the object of finding an explanation of this reaction some further experiments were made.

Posselt gave no formula to hederic acid, but in one analysis found it to contain 66·5 per cent. carbon, and 9·5 per cent. hydrogen. He also found that the substance lost 5·42 per cent. water at 100° C., and chars without melting at a higher temperature.

From Posselt's figures, the simplest formula that results is C_4H_6O; the true formula would be a multiple of this.

An attempt was made by the writer to isolate sugar from the molecule of hederic acid by boiling it for a long time (twenty hours) in contact with a two per cent. solution of sulphuric acid. No visible change occurred, but the solution contained a substance much resembling sugar in its properties. The sulphuric acid was removed by baryta water, and the excess of this by carbonic anhydride, and on evaporation of the filtrate to dryness it left a sticky transparent barley sugar-like mass, possessed of the following characters:—

It contained barium.

It gave with camphor and sulphuric acid the purple colour which Hake and I have shown sugar to produce.

It aqueous solution reduced Fehling's test readily, and also nitrate of silver.

Strong sulphuric acid charred it in a manner resembling the action of the acid upon sugar.

After drying at 100° it admitted of pulverization.

On analysis it afforded the following results:—

(1) 0·290 grm. gave on combustion with plumbic chromate 0·110 grm. H_2O; an accident ruined the carbon estimation.

(2) 0·190 grm. gave 0·103 grm. $BaSO_4$. These figures give 4·42 per cent. H and 31·84 per cent. Ba, the two elements standing in the relation of 1 Ba to 19 H. This is identical with the relationship exhibited between the same constituents of a similar substance obtained in a like manner from scammony-resin. Assuming gluconic acid $C_{12}H_{18}O_9$ to be dibasic its barium salt $C_{12}H_{16}BaO_9$ would contain 31·06 per cent. Ba and 3·62 per cent. H. On the other hand, glucosate of barium 2 $(C_6H_{11}O_6)$ Ba contains 27·8 per cent. Ba and 4·44 per cent. H.

I have no doubt that the body derived from hederic acid whose analysis is given above represents an intermediate state occurring in the spontaneous change of glucosate into glucinate of barium. Of its sugar-like character, however, there can be no doubt.

Mr. Davies said Dr. Hartsen had stated that the substance he had discovered in ivy leaves yielded sugar when boiled with dilute sulphuric acid. He went so far indeed as to give the exact amount of sugar, 33·38 per cent. He (Mr. Davies) had shown the substance to be identical with hederic acid, and in consequence of a remark made by Mr. Kingzett at the Glasgow meeting had performed the same experiment, taking the same means to get rid of the sulphuric acid employed. Although he had not analysed the barium compound, he had shown the presence of sugar by the fermentation method. Mixed with a little yeast the syrupy liquid yielded carbonic acid, so that as the result of the investigation of three observers there could be no doubt that this body was a glucoside, though what the nature of the other substance was remained to be determined. He hoped to have the opportunity of showing this, perhaps at the next meeting.

Mr. Kingzett said, in justice to himself, he must remark that he had not seen Hartsen's paper at the time of the last meeting of the Conference, and had never previously heard of hederic acid, but had made the suggestion on hearing of the colour reaction quoted by Mr. Davies from Posselt. It was true Posselt made the solution and found it reduced Fehling's test; but that did not prove that it contained sugar, as there were other substances that effected a similar reaction.

Mr. Davies did not think he had mentioned Posselt, if so it was in mistake for Dr. Hartsen, who stated that he had found a new substance in ivy leaves. Dr. Hartsen appeared to be manufacturing chlorophyll when he found this new substance in ivy leaves—he described it in the *Archiv der Pharmacie* for April, 1875. On seeing this paper Mr. Davies concluded that this substance was identical with Posselt's hederic acid, and experiments showed this to be so.

Mr. Kingzett explained that for a long time he had been occupied with studies of bodies some of which give, with strong sulphuric acid alone, a violet colour and others which give this reaction on the further addition of cane sugar. It was in virtue of special knowledge, therefore, he had suggested that hederic acid was a glucoside. He had put his own suggestion to experimental test and had substantiated its truth, and Mr. Davies had in this respect imitated him and confirmed the result. As Mr. Davies seemed acquainted with

* *Ann. Chem. Pharm.*, lxix, 62. See also paper by Dr. F. A. Hartsen, in *Archiv der Pharmacie*, April, 1875.

† "On Some New Reactions in Organic Chemistry and their Ultimate Bearings." *Pharm. Journ.*, May 12, 1876.

Hartsen's paper he could probably tell the meeting whether Hartsen had really effected any analyses of the sugar or had contented himself with the reduction test.

Mr. Davies could not tell.

The President in proposing a vote of thanks to Mr. Davies and Mr. Kingzett, said he hoped this subject would lead to some further communications.

The next paper read was on—

The Supply of Cinchona Bark as Connected with the Present Price of Quinine.

BY JOHN ELIOT HOWARD, F.R.S.

The price of quinine is at the present moment abnormally high; and a medicament which, in many portions of the world, has become a prime requisite for healthy life, is thus placed almost out of reach of the masses of mankind.

The cause of this undesirable state of things is to be found, not in any natural failure of the supply of the material from which it is derived, but entirely from the cruel and desolating effects of war in those portions of South America which have till quite recently furnished the largest importations of cinchona bark. I have described, in my 'Quinology of the East Indian Plantations,' the gradual exhaustion of some of the Andean districts, such as the Bolivian forests, which were first depended upon; and the increasing importance of the Columbian districts, on which the war above alluded to has since told with fearful effect. It has, I understand, deranged the whole traffic. The interruption of the import trade during the war, and the failure of many houses, destroyed the means to pay for the bark. Many of the bark collectors have perished; and the small passes and paths to bring the bark from the forests, have more or less been destroyed by the tropical vegetation, and must be opened again. It will take some time to remedy all this, and even yet the disturbances have not entirely ceased.

The dearth of supply of quinine-producing material thus produced, has been to some extent alleviated by the importations of cultivated cinchona bark from the East Indies, both from the British and Dutch possessions. Without this help the dearth would have amounted to an absolute famine. It is very satisfactory to think that the naturalization of the cinchona in these regions should already have produced such good results; so that the value of the importations from the Government plantations of Ootacamund alone have realized, it is said, some £35,000. I have no means of computing the amount cleared by private owners of plantations, but there can be little doubt that the recompense for their venture has been of a satisfactory nature, thus far; and perseverance in a right course will lead to permanent good results.

In order to this end, they must guard against being deceived by present prosperity. I am inclined to believe that plantations will be undertaken without sufficient foresight, and specially without taking sufficient pains to select really good quinine-producing sorts of cinchona. It is quite true, that all the leading species seem to improve by cultivation. So that the bark of the *C. officinalis*, *C. Calisaya* (in its best forms), and also of *C. succirubra*, are much richer in alkaloid, than when grown in their native forests; but I must reiterate the opinion that nothing but first-class cultivation and wise and discriminating management will in the end be successful.

The present price of quinine cannot be maintained, and will in all probability be followed, not *speedily* but *eventually*, by a reaction, which will place it at a lower level than it has been for a considerable time. The causes that must produce this result are obvious. Not only are the plantations increasing in India,* but even in South America, in certain districts, wealthy landed proprietors are beginning to be aroused, intending to avail themselves of the great natural advantages they possess for cultivation. I have recently been consulted by some of these, who have been led to the consideration of the subject.

* I have recently seen fine succirubra bark from Borneo.

Of course any supply of cultivated bark from America might easily be interrupted; and present experience shows how important it is to have a source of supply independent of the political troubles which afflict the new world; but with moderate care and success, it must be presumed that cinchona bark might be cultivated in South America under conditions very favourable to cheap production, by those who can command a sufficient amount of capital and can secure labour of the requisite stamp.

I think that well conducted cinchona plantations whether in the Old or the New World, must always be profitable, but that the inferior will be eventually a failure, as unable to stand the competition when all is at a low price. I have thus far only looked at the production of quinine. I cannot foresee what will happen as to the other alkaloids, but it is reasonable to suppose that *surely*, though it may be *slowly*, they will take their proper place in medical practice; as regards cinchonidine at any rate the supply is so very abundant (the most so perhaps of all the alkaloids) that the price will always be *low* in proportion to quinine. This must be considered by those who grow plantations of *C. succirubra* in which this alkaloid abounds. My own impression is that cinchonidine is in no sense inferior to quinine, but somewhat different in its operation, and in some cases (specially in children) to be preferred to the favourite medicine. A similar remark may be made in reference to quinidine, which is coming much into favour in some quarters, but can never be so cheap as cinchonidine, as it is a comparatively rare product. Cinchonine is, in my opinion, as powerful as quinine. At all events I use no other alkaloid in gratuitous administration. and never fail to arrest with it the intermittent fevers, of which we meet with examples in this country. I do not know whether the quantity required to effect the result is relatively greater than with quinine.* Cheapness and facility of administration are my inducements to employ the "muriate of cinchonine," though I am inclined to think that the concomitant effects are rather more unpleasant than with quinine; and as regards the other and rougher alkaloidal products, I am satisfied that such is the case. I have some reason to suspect emetic effects as attending one of these. All these medical questions ought to be settled by competent authority.

I would encourage the cultivators to believe that they have nothing to fear from the possibility of the artificial production of quinine. The results of examination by polarized light lead to the inference that the molecule of quinine (for instance), is built up in such a manner that it cannot be imitated by processess which we can employ, although these may produce useful antifebrile substance. Such at all events is my opinion, and has been that of other labourers in this field. There is indeed very much more to be learned in reference to the influence of various agencies on the plants themselves, bearing on the interchange chiefly between quinine and cinchonidine and cinchonine and quinidine, according to the place of growth and the degree of exposure.

Otto Kuntze, a writer in the 'Botanische Zeitung' of 13th and 20th April, 1877, gives us information both on these and other subjects connected with quinology, which would be remarkable if correct; but being unsustained by any proofs other than the infallibility of the writer, will not, I suppose, be received, except by the worshippers of *Einsicht*.

He sets aside the labours of all previous botanical observers, adopting only my one species of *C. Pahudiana*, and includes all the rest (for if I understand him aright, he finds all the South American species in Java and

* Following the best medical authorities, I have often cured agues which had been unsuccessfully treated by too small doses of quinine.

India) under the new heads *C. Weddelliana*, *C. Pavoniana* and *C. Howardiana*.

Now I must protest that I have not the slightest claim to have this species named after me, for this plain reason, that it was discovered and described, and well named *C. succirubra*, long before my acquaintance with the genus began. That which I was enabled to do was to resuscitate the somewhat buried and forgotten knowledge of this now widely spread and specially important species. In my examination of Pavon's collection of Peruvian barks, published in the *Pharmaceutical Journal* for 1852, I said, after describing the bark No. 45, the *Cinchona succirubra*, "red juice," whatever its botanical origin, is, I think, commercial "red bark." At a later period (1855-6) I was in possession of authentic specimens from South America, which I described in the same Journal of October, 1856, with a plate of the leaves. I also stated that I had found in the preceding year Ruiz and Pavon's botanical specimen of this plant.

Later on in 1858, I received from South America more abundant and more instructive specimens from Quito, which I have described in my illustrations of the Nueva Quinologia (1862) of Pavon, together with Pavon's diagnosis written in 1826. In 1866 I gave more particulars in reference to the varied forms under which this species appears, which will be found in the report of the Botanical Congress published in 1867. I have now from all quarters beautiful and typical specimens and flourishing plants of this *C. succirubra*, and of its hybrids, which assume indeed such a polymorphous shape that I think out of 800 young plants, which I reared at one time, a person ignorant of their hybridity would have had no difficulty in discovering more than the supposed seventy species to which our author refers.

It is quite otherwise with the unhybridized seed, and with the plant in its original habitat. It is a notably distinct series of forms, markedly distinguished by the chemical composition as well as by botanical characteristics. The word succirubra points to this, for although not generally understood, the juice is wholly different in its chemical reactions, and the tannin strikingly contrasted with that of other cinchona.

It is known from the observations of many observers that spontaneous hybridizations take place almost always between types relatively markedly distinct, rather than between species offering much affinity.

It is perhaps from this cause that the *C. succirubra* tends so much to form hybrids in the Indian plantation. M. Alexis Jordan remarks that "one only species may fecundate many others, and throw disorder into a whole collection. For practical florists there is here sometimes a precious advantage, but for the botanist who seeks to assign limits to species it is a veritable plague; for hybridity introduces confusion, and *chaos reigns wherever it plays a part and gives fertile products*. That which is best to be done in this case is to destroy the hybrid subjects and to throw away their seeds. In order to recommence the study, it is necessary to have new seeds and new subjects."

It is difficult to get seed that may be depended upon from the mixed plantations in India. As an illustration of this, I will describe the results of a sowing of seed professedly of *C. officinalis*, *C. succirubra*, and *C. calisaya*, obtained from Kew, and said to be from Java.

The young plants developing will give me seventeen of *officinalis*, of which one appears hybrid—the rest sorts but not the truest form—ten of *C. succirubra*, of which not one even approaches to the true form, and forty-six *calisaya*, more or less hybridized, but a fair number promising pretty well, and amongst these forty-six, two or three of a curious *sport* with parti-coloured leaves. It is impossible to say what the value of such a sowing would be when grown up into a plantation.

On the other hand, it is an undeniable fact, that the best results have been obtained from plants of which the genealogy is known, and the succession kept perfectly pure. There is not in British India any *plantation** yielding so good bark, as the 60,000 trees which McIver reared from the one tree which I gave the Indian Government. This I have abundantly described as the *C. uritusinga* of Pavon, and the seed was sent me together with botanical specimens from the mountains of Uritusinga. The bark sent me by McIvor exactly reproduces in appearance that from Uritusinga. I have given the analysis of the different generations, and now the bark has yielded me equal to 7.50 per cent. of beautiful sulphate of quinine†—the alkaloid existing in this bark in a state particularly easy to separate and purify. It appears to have the advantage over the other forms of *officinalis*, except the *angustifolia*.

For another striking illustration of the above statement, I should refer to the *C. Calisaya* var. *Ledgeriana* in Java. Of course the genealogy of this tree is perfectly known, and has been described in my 'Quinology.' There is not the smallest reason for supposing it a hybrid, and the exceedingly rich production of pure quinine alike in the three forms I have given, stamp it as a peculiar species, for as I have shown in my analysis of the *Calisaya Anglica*, a real hybrid partakes of the qualities of *both* parents, and here the constitution is *unique*, as under:—

A form.

'Quinology,' page 59	Quinine	9·06	
	Amorphous	1·40	
			10·46
	Cinchonine		0·10
			10·56

B form.

Ditto, page 60.	Quinine	9·91	
	Amorphous	2·09	
			12·00

C form.

Ditto, page 60.	Quinine	9·97	
	Amorphous	1·70	
			11·67

The small *white* flowers, bearing no resemblance to any but those of *C. micrantha*, are also highly characteristic. M. Moens writes me on receiving my 'Quinology,' "the plates are very beautiful and the plants well represented; as your artist had to make them after dried specimens,‡ the colour of the leaves and of the flowers is sometimes a little different from that of the living plants. So in plate IV. the colour of the under side of the leaves is too blue, and the flowers have a reddish or brown hue, whilst those of the tree (now dead) were white with a very light yellow tint. Plates V. and VI. are excellent, as also VII. and VIII."

All this is exactly the opposite to what Kuntze says, p. 239, "ferner steigert sich überhaupt der Chiningehalt mit der hybridität," of which assertion as usual he gives no proof. He also says, "the darker the colour of the flowers, the richer in quinine is the bark." But it would occupy too much time to point out all the errors into which he has fallen.

It seems to me that what we need is not so much fresh classification, as the observation of actual facts, on which true classification may be founded. The genus cinchona does not differ as to its polymorphous character from various other families, and in these it has been well shown that constant hybridism produces a perfect chaos of forms—unstable and liable to revert to the original species. This is not an ordinary condition of things in the native places of growth of the cinchona, as the different

* I take no notice of small importations of good *Calisaya* from British India, nor of the *renewed* Red Bark, which is a complete success.

† 'Quinology, E. I. Plantations,' page 83.

‡ This does not apply to plates IX., X., XI., XII., which were from living plants.

forms are ordinarily very much localized and very distinct. It is possible that in the Yungas of Bolivia where several typical forms are found together, and bees are said to abound, the case may be different. On the whole this family of plants appear to me to exist in a great number of *nearly allied but permanently differentiated forms*, ranging themselves around central groups, having strongly marked physical specialities which can be appreciated even more fully by chemical analysis than by botanical distinctions. These do not appear to have been produced by hybridization, neither do they correspond with the commonly received notion of species and varieties. The careful French botanist, M. Alexis Jordan, has, in the course of some thirty years of observation and of experimental cultivation, arrived at similar views in reference to other genera of plants.

Those who would cultivate successfully must be guided rather by carefully conducted experiments than by unsubstantial theories.

The PRESIDENT said this was a paper from a gentleman who had devoted perhaps more attention to this subject, and had more successfully studied it than any other living man; he had published very largely upon it, and his suggestions were entitled to the very greatest respect. Mr. Howard, with many others, was impressed with the importance of preventing the extermination of these valuable trees which were the only sources from which the cinchona alkaloids could at present be obtained. In South America no special attention had been given to the keeping up of the plantations, and destruction appeared to have been going on for a length of time; and although means had been resorted to by the English Government in India and by other governments elsewhere to develop the cultivation of these trees, Mr. Howard seemed to think that something of the same sort ought to be adopted in South America.

A vote of thanks having been voted to Mr. Howard,

Professor ATTFIELD said it seemed quite astonishing, considering what had been published with regard to the therapeutical value of the cinchona alkaloids other than quinine, that they should not have come into more general use. Experiments had been conducted on a large scale in India, and from the reports put forward by medical men there seemed to be no question of the value of these other alkaloids, but though they were used to some extent it was remarkable that they were not employed more generally. It appeared to him that the pharmacists present might perhaps suggest some means by which this desirable result could be secured. Substances with fanciful names which did not indicate their composition in any way had got widely known by means of advertising, and it occurred to him that if Messrs. Howard would condescend to push these preparations as other men pushed their wares they might be brought more generally under the attention of medical men.

Mr. WILLMOTT said the difficulty of introducing any other alkaloid in place of quinine was very great. This no doubt arose partly from the fact that there was a certainty about quinine which the other alkaloids did not appear to possess. Messrs. Howard not long ago kindly sent him a large bottle of citrate of cinchonidine and iron which he endeavoured to introduce into King's College Hospital in the place of quinine and iron, but found it was quite hopeless and the bottle remained unopened. He regretted this because if cinchonidine was really of the same value as quinine the saving of expense would be of great importance in the case of hospitals and similar public institutions. He had no doubt, however, that such exceedingly able papers as they had just heard would go far to remove the prejudice which existed.

Dr. SYMES stated that Messrs. Howard had published a pamphlet on the subject of these alkaloids and would willingly supply them to any pharmacists who could make use of them. He was glad to say that at least two hospitals in Liverpool were now using citrate of iron and cinchonidine.

Dr. PAUL thought it was not altogether a matter of commercial enterprise to bring these alkaloids into use. Messrs Howard had laboured actively for some years to introduce especially the sulphate of cinchonidine, but their efforts had been to a great extent fruitless. It was not because these alkaloids were unknown or inaccessible, for both Messrs. Howard and Mr. Whiffen made sulphate of cinchonidine almost perfectly pure at 2*s.* an ounce, and several German makers also turned it out in large quantities, but still it was hardly ever prescribed. It was not open to the same objection as the amorphous alkaloid in the making of the scale preparations, where the disagreeable taste of that body was a bar to its use, for citrate of iron and cinchonidine was quite as pleasant to the taste as the preparation of quinine. It appeared to him that before the use of cinchonidine instead of quinine could be looked for, some authority required to be furnished for its use as a medicine; if for instance, the College of Physicians would authorize its use, medical men would be more disposed to prescribe it. The result of the commission appointed in India showed that sulphate of cinchonidine was scarcely inferior to quinine in the class of fevers for which it was principally used. He might mention as a practical result of the introduction of the barks now being used, that they might not improbably look for the introduction of cinchonidine in a rather objectionable form, namely as an admixture, perhaps 10 or 20 per cent., with the sulphate of quinine of commerce. This already existed to some extent, he was sorry to say.

Mr. BENGER said he had been supplied by Messrs. Howard on two occasions with a large number of samples of cinchonidine which he had distributed amongst the medical men of Manchester, but with very small result in the shape of prescriptions. Some gentlemen to whom he introduced it prescribed it for a short time, but then discontinued it, probably from forgetfulness. Several professional gentlemen told him they believed it answered as well as quinine, but no better, and they preferred quinine as they had always been used to it.

Mr. E. SMITH as the result of his experience found there was great difficulty in inducing medical men to use anything which came from bark other than quinine. He struggled very hard at one time to introduce muriate of cinchonine and sulphate of cinchonidine, but to no purpose, and he did not see how the difficulty could be got over except by making cinchonidine fashionable, and the best way to do that probably would be to put a high price and a fancy name upon it.

Mr. PAYNE (Belfast) suggested that these alkaloids should be introduced into the next edition of the Pharmacopœia and so made official preparations. He had had medical men apply to him for some substitute which would do as well as quinine, and on suggesting to them sulphate of cinchonidine they had reported that they could not see any difference in its action.

Mr. GROVES remarked that it was very unpleasant to them all to have to put their hands so deeply into their pockets on account of the present price of quinine, but he derived some consolation from feeling that this high price must compel doctors to give a fair trial to the cheaper alkaloids. It occurred to him that as an enormous quantity of cinchonine and cinchonidine must be made as bye-products in the manufacture of quinine, these bodies must be accumulated to an enormous extent unless indeed they were introduced into practice surreptitiously.

Mr. W. D. SAVAGE said he had recently induced a large public institution with which he was connected to introduce cinchonidine owing to the present high price of quinine although he had failed to do so before.

Mr. EKIN remarked that Mr. Howard had referred to the great increase in the yield of alkaloid from the cultivation of the plants; and notwithstanding this was still rather a moot point, he believed that cultivation properly carried out had that effect and he was therefore surprised to hear a gentlemen state that morning that, in the case of aconite, cultivation distinctly lessened the amount of alkaloid formed in the plant.

The PRESIDENT remarked that that was probably because the proper mode of cultivation was not understood.

Mr. GERRARD said amorphous alkaloid of the cinchona bark was extensively used at University College Hospital amongst the out-patients, for one year entirely, and it was found to be a valuable tonic, but it was also an emetic, and therefore it had to be discontinued.

Mr. PLOWMAN said that the sulphate of cinchonidine had been used in St. Thomas's Hospital for a considerable time. It was decided some time ago to substitute it for sulphate of quinine in all ordinary tonic mixtures, but not where it was given as a specific in fevers. It was also used with citrate of iron; and its consumption was now ten times that of quinine. Whenever quinine was intended to be used it was the custom now to underline the word.

Mr. MANBY was quite certain, from considerable personal experience, that the alkaloids of quinine had not the same effect in a multiplicity of diseases as the original cinchona bark. Whether this was because certain properties were destroyed in obtaining the alkaloids he could not say, but he was quite satisfied that in the case of the agues prevalent in some counties a decoction of the bark had a much more beneficial effect than quinine.

Mr. MAITLAND said he had often had occasion to take sulphate of quinine, compound tincture of bark, and so forth, but had received most benefit from aromatic sulphuric acid combined with well made compound tincture of bark. He might also mention that he did not find headache or constipation arise from taking cinchonidine to so great an extent as from quinine.

Mr. GREENISH said he had quoted from the ablest writer on the subject, Professor Schroff, in his remarks on the effect of cultivation of the aconite plant.

Mr. UMNEY said there could be no question that India was the great field in which quinine and other cinchona alkaloids were tried. In the *Lancet*, about twelve months since, a report was published from a leading surgeon (he believed in Bengal), which stated that cinchonidine was almost valueless as compared with quinine. When there were such contradictory statements as to the value of these bodies they could not expect medical men at home to take them up, except for further experiment. He had no doubt the time would soon come when East Indian cinchona barks and their alkaloids would be introduced into the Pharmacopœia, for they were already largely used in manufacture. Very little fluid extract was now made from calisaya bark, which of late years had much deteriorated, some specimens of which would not contain more than two or three per cent. of total alkaloids, whereas the bark of *Cinchona officinalis* (East Indian) contained as much as six per cent. of quinia and yielded a fluid extract far superior to any made from the finest calisaya bark. The same remark applied to the East Indian *Cinchona succirubra* bark, which was now largely used.

Mr. SIEBOLD thought the nonsuccess of pharmacists in their attempt to introduce these alkaloids to the medical profession was due to their efforts being isolated; if they would all agree to use their influence with those medical men whom they knew they might be more successful.

Mr. SCHACHT ventured to utter one word of protest against what was now proposed, for he thought it hardly becoming on their part to urge any particular article on the medical profession, if such article were not the best; and with all the laudation which they had heard of cinchonidine and the other alkaloids, no one had ventured to say they were better than quinine. In that fact lay, he believed, the whole explanation of the phenomena on which they had been commenting. A medical man should use the best thing he could get, and the mere difference of a fraction of a penny or a farthing in the cost per dose ought not to influence him. Whether quinine, cinchonine, or cinchonidine, or all the alkaloids in combination, represented the whole medical qualities of the bark was another question, but he thought it better not to discuss that now.

Mr. LAWSON TAIT (Birmingham), as a medical man, was bound to say that the difficulties which had been referred to existed in the minds of those who used as well as of those who prepared these alkaloids. In the cinchona bark there were a great many different properties, and from a long hospital experience he was quite satisfied that results were to be obtained from a decoction of bark which were not to be derived from either of the alkaloids. He had had no experience in hot countries, but within a few days he had been called upon to treat a case of ague in the person of a friend who had been long practising in Bengal. He gave him 10 grains of quinine, and the result was the disease was cut short and did not return, which it would have done, being quotidian ague, if the quinine had not been efficacious. At the same time he did not believe quinine alone was a tonic, for he did not find it to act as such in the case of many patients who come under his care.

Mr. BURTON said the result of long observation on his part showed that a decoction of bark was often more effectual than quinine. He had known cases in which persons suffering from ague had been cured by the bark when quinine had produced little or no effect.

Dr. PAUL remarked that a distinction should be drawn between the specific virtues of different constituents in the bark. The value of the astringent principle as a tonic had been long recognized and by some physicians was considered far superior to quinine; but, on the other hand, quinine had a specific value for certain purposes, and if the result of the medical commission appointed in India was to be accepted, the value of cinchonidine was about 80 per cent. of that of quinine. As an immense quantity of bark was now produced which contained only about 1 per cent. of quinine, with 3 per cent. of cinchonidine, it was a very practical question whether the value of that 3 per cent. was to be abandoned because this bark could not be used for making quinine.

The PRESIDENT said they could not anticipate that anything they could say there would tend to deprive quinine of its preeminence. There had, however, been a great deal of testimony from medical men that effects were produced by the preparations of cinchona bark which neither of the alkaloids separately was capable of producing. He thought possibly medical men would be more likely to try these other alkaloids if the whole of them were converted into a soluble salt and recommended for use. The effects he referred to might be due to something beyond the alkaloids but at any rate a preparation containing the whole of the alkaloids seemed to be a desideratum, and might be more readily introduced than they could separately.

Mr. WILLIAMS remarked that such a preparation as the President had referred to already existed under the name of quinetum, manufactured by Mr. Whiffen.

Mr. MARTIN did not find there was any great difficulty in introducing cinchonine or cinchonidine to the notice of medical men and getting them to try them, but the next time they prescribed they went back to quinine, no matter what the price was. Whether this was for want of an authoritative voice to speak in its favour, or from any defect in the alkaloids themselves he could not say, but in the North of England quinetum was considered to be merely a diluent of quinine.

Mr. SILSON (Bradford) observed that one great channel of consumption of quinine seemed to have been overlooked, viz., the purchase of the public themselves. It was astonishing the number of people who had an idea that quinine cured everything, and who came for it whatever ailed them.

The title of the next paper read was—

NOTES ON AN IMPURITY IN OXIDE OF ZINC.

BY W. W. STODDART, F.C.S., ETC.

A few weeks ago I had a sample of oxide of zinc sent to me for analysis. It was bought for mixing with white lead as a paint, but on being ground was found to be nearly useless. It would not readily combine and form a homogeneous mass, as usual, nor would it give the "body" required. In fact it was so unsatisfactory an article that it was laid aside and another used in its stead. Some objection was raised to its being returned and caused the firm to have it examined, and the cause of failure ascertained.

I have brought the subject before your notice, not on account of the peculiar impurity, but because it has a pharmaceutical interest, for it answers well to all the pharmacopœial tests for pure oxide of zinc, and yet it is impure to the extent of nearly ten per cent.

The sample was nearly white with a very slight buff tint. Like the pure oxide it became a strong yellow when heated, regaining its former whiteness when cold. It was perfectly and easily dissolved in an excess of carbonate of ammonia, and the alkaline hydrates. From the alkaline solution a white precipitate was produced by sulphide of ammonium. It dissolved without effervescence in dilute nitric acid, and was so little affected by chloride of barium that after standing for several minutes, the milkiness was so slight as to require a close scrutiny for its recognition.

If, however, the solution in nitric or hydrochloric acid be made in a flask, a strong odour and copious evolution of sulphurous acid gas becomes very evident.

A few grains were placed in dilute hydrochloric acid with a small piece of pure zinc when sulphuretted hydrogen was evolved, and speedily became evident with the help of a bit of lead paper.

The addition of chlorine water produced a distinct precipitate of sulphate with chloride of barium.

The use of nitroprusside gave a red colour with a little of the solution to which a little soda and acetic acid had been added.

An analysis showed that the sample was composed of oxide and sulphite of zinc in the following proportions:—

Oxide of zinc	90·87
Sulphite of zinc . . .	9·13
Sulphate of zinc, a very slight trace.	
	100·00

The trace of sulphate was so small that it was probably due to oxidation of the sulphite. The cause of the presence of sulphite of zinc is not quite apparent, but the sample came from a continental house, and was very likely manufactured from a sulphide of zinc in some rapid and imperfect manner, which had partially oxidized some of the sulphide, and produced the impure product of which complaint had been made. The appearance of the sample suggested a process by heat rather than by precipitation.

The PRESIDENT said it was new to him that oxide of zinc was ever met with contaminated with the sulphite, and he could not see what the source of such oxide could be.

Mr. WILLIAMS though it must be accidental.

Professor ATTFIELD said he had heard it stated that so-called oxide of zinc was made on a large scale by roasting the native sulphide; now every worker at quantitative analysis who had endeavoured to convert his two or three grains of sulphide of zinc into oxide by roasting must know that it was difficult to do so entirely without a trace of sulphide remaining.

The PRESIDENT asked what sulphide of zinc could be used for the purpose. He knew of no native sulphide of zinc that would yield anything approaching to the kind of compound alluded to, as it was always contaminated with iron, and also largely with manganese. If there were an artificial sulphide of zinc produced in any quantity this might account for it.

Mr. WILLIAMS said sulphide of zinc was produced for the purpose of vulcanizing india rubber, but it was rather an expensive thing compared to oxide of zinc, and he therefore could not suppose that that was the source of the impurity in question.

Dr. R. OXLAND suggested that the sample examined by Mr. Stoddart might possibly have been the result of an attempt to decompose sulphate of zinc by some hydrocarbon combined with exposure to heat. He could imagine that passing carburetted hydrogen over sulphate of zinc at a certain temperature would produce oxide of zinc and a sulphide.

The PRESIDENT said the oxide of zinc used for making paint was made by the old method of burning.

Dr. OXLAND said a large quantity of sulphate of zinc was produced in the process of autogenous soldering, in making lead chambers; perhaps an attempt had been made to utlilize the sulphate thus obtained, and convert it into oxide.

A vote of thanks to the author was passed.

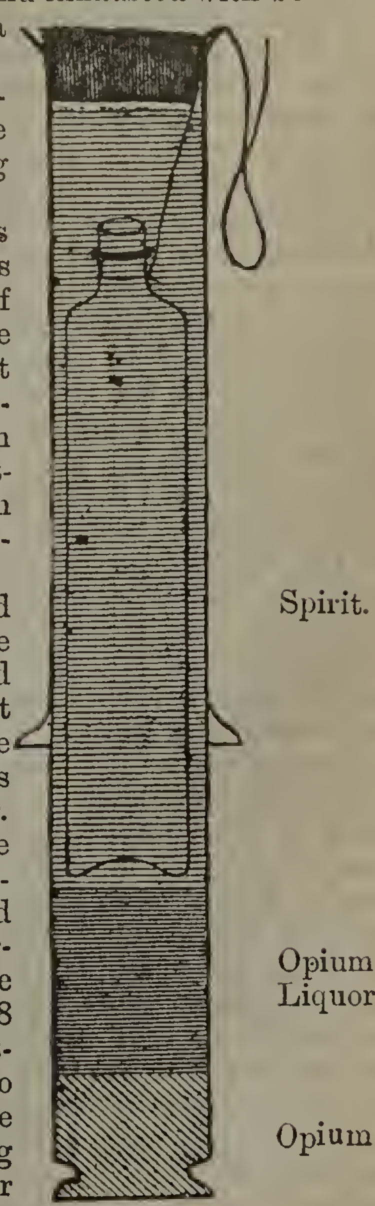
The next paper read was a—

SUPPLEMENTARY NOTE ON THE ASSAY OF OPIUM.

BY B. S. PROCTOR.

Since the publication of my former note on this subject, I have recorded two or three small matters which I now offer for your consideration.

The process as described at our last meeting was devised with the object of being at once accurate and speedy. One ground upon which I advocated its preference to other modes being that a sample of opium from a chest could be assayed and its value determined in the course of a couple of days—most other processes making any pretentions to accuracy requiring considerably more time—such for example is the case with the process described by Mr. Cleaver at the same meeting, the opium having to be dried, powdered, and exhausted with benzine before the extraction of morphia is commenced.



With the view of further expediting the extraction, I have modified the mode of operating thus:—

Rub the lump opium with its own weight of water, to as smooth a pulp as possible, if necessary with the aid of a gentle heat; add spirit equal to about three times its weight and transfer to a percolator tube which is furnished with a loosely fitting inner tube closed at both ends for increasing the hydrostatic pressure.

A phial filled with water and corked answers well for the inner tube, a string being tied round the neck, by which it may be let down gently till the bottom of the phial just touches the surface of the opium liquor. Its position may then be fixed by pressing the string between the side of the tube and a cork wedge. When thus arranged, more spirit may be added till a column of 6 or 8 inches is obtained without disturbing the marc or mixing to any appreciable degree with the opium liquor, and without using more spirit than is required for the exhaustion of the opium.

To quote one experiment in illustration, 200 grains of a soft sample of Turkey opium treated thus, a head of 8 inches pressure was obtained. In four hours, four ounces of percolate had passed through, which contained 98 per cent. of the morphia present; another ounce was considered to have effected practically a perfect exhaustion. Other trials gave similar results.

In assaying sundry samples of opium by the method I have recommended, I have occasionally met with specimens which deposited, along with the morphia, a white amorphous substance which could be washed out only by long continued washing with spirit, strong or dilute.

These specimens I have assayed by the lime process and by the acetate of lead process (in conjunction with the above mode of extracting), but without quite satisfactory results.

Upon the whole, I find it most advantageous to cut the washing short when I find such impurity present, dry the precipitate, wash out the narcotine with benzine as usual, and then redissolve with hydrochloric acid and spirit, and reprecipitate with ammonia, which treatment I have never found fail to give me well crystallized and nearly white morphia of almost absolute purity. If the quantity of spirit and water used for solution be limited to two drachms of each (the quantity I find desirable for an operation upon 100 grains of opium), and the washing be not unnecessarily prolonged, one quarter grain may be allowed for the loss in purification. I find the solution by spirit and acid followed by reprecipitation is both more convenient and less wasteful than crystallization from boiling alcohol, which has been recommended by some analysts; and I find the loss of time is not necessarily great, for the morphia goes down with more promptness and certainty from this approximately pure solution than when deposited from a liquor containing the soluble extractive matters of the opium. Three to four hours are sufficient in the former case, while eighteen to twenty are desirable in the latter.

I have found in sundry cases that the precipitation of the morphia from solution in *strong* spirit and acid is advantageous, inasmuch as the crystals are whiter, larger, and sooner washed clean, but my experience is too limited yet to say whether the strong spirit is generally preferable. When rectified spirit is used, without water, for the solution from which the morphia is to be precipitated, a larger correction must be made for the quantity of morphia retained in the mother liquor.

Mr. Cleaver, at the Glasgow Conference, regarded his washings as saturated solutions of morphia, and pointed to the defectiveness of my process in not making a similar estimate of the loss of morphia in my washings. I thought it more reliable to make a total correction for the loss of morphia in the mother liquor and washings founded upon sundry experiments where the actual loss of a known quantity of pure morphia similarly treated was ascertained. He regarded the washing water as a saturated solution of morphia, and quoted evidence in support of the supposition. It appeared to me theoretically improbable that the washings should be saturated, and I have not been able experimentally to determine their degree of saturation as he did with fusel oil. Of course my failure is my fault and not his, but I have varied the experiment and washed 8·6 grains of pure morphia with a pint of water and found it had lost only 1·4 grains, instead of being entirely washed away as it should have been if Mr. Cleaver's estimate (that the washing waters contain $\frac{1}{1000}$ of morphia) had been correct. I would not be so bold as to assume that the proportion of morphia in the washing waters generally was in the ratio of 1·4 grains to a pint, but I think it is safe after sundry experiments to assume that the loss of morphia in the mother liquor and washings when the process is performed as I have described, amounts to 0·2 to 0·25 grain.

Some analysts recommend the washing of the precipitated morphia with a small quantity of chloroform as well as with ether, benzine, or spirit. In sundry experiments I have found the loss involved by its use to be very trifling, but I have limited its quantity to a fluid drachm or two, and in those cases where the washing with spirit and benzine did not readily remove the impurities the chloroform also failed to do so unless used freely, and as its solvent action upon morphia is much greater than that of ether or benzine, the estimation of the morphia washed away by its use becomes more important, at the same time that it is more troublesome.

It is unnecessary for me to quote in detail the percentage of morphia I have found in the samples I have met with in the ordinary course of trade and analysis, but I may mention briefly that my experience corresponds closely with that of Mr. Dott, published in last year's transactions, except that my results are in general a little lower, and conspicuously so in one or two cases. Thus his lowest percentage of morphia in Turkey opium is 6·9, calculated upon the drug in its moist state, while I have met with one good looking sample offered me as of best quality which contained only 3·5. I also find that 11·2 is the highest percentage of morphia I have found in Turkey opium in its fresh moist condition.

The requirement of the Pharmacopœia that opium in its moist condition should yield 6 to 8 per cent. of a crude precipitate of morphia by a given process has frequently been criticized as being too low. I scarcely think that 8 per cent. should be considered too low if a *pure* morphia be obtained and the sample contains a usual quantity of water, but it would be more satisfactory to say definitely that the opium for pharmaceutical use should contain within a fraction of a grain, more or less, of 10 per cent. of morphia calculated upon the drug in its dry condition. According to present rule a poor sample of opium may be brought up to "Pharmacopœia standard" by partial drying, while the same standard would not exclude another sample of double strength tested in its moist condition.

Basing the calculation upon the dry opium has the further advantage that it is its morphia value in this state which determines its medicinal activity when administered as powder, compound powder, tincture, etc.

The percentage of water in moist opium I have found to vary from 19 per cent. to 27 per cent. Mr. Dott's table agrees closely with my observations in this particular, if we omit one anomalous sample which he found to contain 31·2 per cent. of water and only 20·1 per cent. of aqueous extract.

In conclusion, I may note that the degree of dryness to which an analyst reduces his sample considerably exceeds that to which the bulk is reduced by the drug grinder. Powdered opium, fresh from the mills loses 5 to 6 per cent. of its weight by further drying.

Dr. Paul said he had frequently made attempts to extract opium within a reasonable time by the method of percolation, but had never succeeded in getting a result worth anything, in the time required; for this he had tried all kinds of devices, he could never get the extraction quickly enough. With regard to the correction for morphia remaining in solution, or washed out in the process, he thought great care should be exercised in laying down any specific co-efficient for so much morphia dissolved in so much mother liquor, or removed by washing, because the extent to which alkaloids dissolved in different solvents varied very much according as they were going into solution on passing out. This was very marked in the case of some of the quinine alkaloids; for instance, sulphate of cinchonine could be evaporated until it was quite syrupy without crystallizing; but when it was in hard crystals, like sulphate of potash, it was equally difficult to dissolve it in five or six times the qnantity of water absolutely necessary for holding it in solution.

The thanks of the Committee having been accorded to Mr. Proctor, the following paper was read:

Sugar in Pharmacy.

BY CHARLES SYMES, PH.D.

Of the many thousand tons of sugar refined weekly in this country, in addition to that so imported, but a small portion enters into the domain of pharmacy, and hence whilst volumes have been written on the various processes and treatment which it undergoes from the source of its production till it reaches the table of the consumer, but little of this literature has dealt with the subject from a pharmaceutical point of view. Perhaps pharmacists feel it to be too insignificant a substance, void of medicinal value, and therefore not meriting attention. Yet sugar is an article of the Pharmacopœia, and as an adjunct, excipient and preservative plays an important part. It does more than this; by entering into chemical combination with certain other substances it increases their potency, a familiar example of which we have in saccharated lime water, and perhaps less familiar, its compounds with iron etc., some interesting experiments on which are described by Dr. Gladstone (*Journ. Chem. Soc.* vol. vii, p. 195). When used mechanically to divide the particles of other bodies, it also tends to increase their medicinal activity. Triturated with calomel we have this result most markedly; in other cases it is merely protective, saccharated carbonate of iron affording us an example in which it retards, and in a great measure prevents peroxidation. In solution it forms the best vehicle for the administration of nauseous medicines, is a solvent of certain active principles such as those of Peruvian bark, also a preservative of certain flavouring agents, and of some chemical substances, notably the protosalts of iron.

But it performs these offices in a satisfactory manner only when certain conditions are observed, and only so long as itself remains unchanged, for if fermentation once sets in destruction of the syrup, together with the substance it was intended to preserve, is almost sure to result.

It is perhaps scarcely necessary to remark that in the selection of sugar for syrups, purity is of the first importance; this object fortunately it is not difficult to attain. Good lump sugar such as Say's, crystals such as were formerly produced by Finzel, now by Tate and Son, or granulated such as is sent out from the Eastern Sugar Refinery, Boston, and imported into this country in casks of about 2 cwt. each, are all practically pure sucrose; the ash yielded by either is not more than from three to six parts in 10,000 (representing about double that quantity of mixed potash and lime salts), and a mere trace of glucose. There appears to be a decided prejudice against sugar produced from the beet for use in pharmacy, which arises probably from the fact that the crude article is much more impure than that derived from the cane, but this is not necessarily so in the refined product; a more elaborate process and greater care in the refining are necessary, but we have really nothing to do with this and should look only at the results. Now Say's lump which is largely and for months in the year exclusively prepared from beet, is regarded in the sugar trade as a standard of purity. The prejudice, however, is not altogether unfounded, for unless beet sugar be thus perfectly refined a trace of volatile oil is liable to remain, also a trace of nitrate of potasium, which is probably the source of a minute quantity of nitric acid when in solution. Sugar thus impure is rejected by the confectioner, as it is found to decolorize some of his goods, and of course would be unsuitable for pharmaceutical purposes. Solubility stands next in importance to purity, for it is a well known fact that under the prolonged action of a large bulk of water it becomes inverted and this is accelerated by heat. Some pharmacists always use sugar in large crystals under an impression that it is the purest; it is, however, only equally pure with the other kinds I have mentioned, and possesses the one disadvantage of being the least readily soluble, whilst the granulated is superior in this particular to both it and the lump; indeed, in my opinion, it is the best and most convenient for preparing pharmaceutical syrups, especially as an important point we have to avoid in the preparation of these is invertion, *i.e.*, the breaking up of the sucrose molecule $C_{12}H_{22}O_{11}$, with the appropriation of a molecule of water H_2O into two molecules of glucose $2C_6H_{12}O_6$, which is the first stage in fermentation, and although this is not a necessary sequence it is much more likely to occur when the first stage of the process is already accomplished.

If we have a very soluble sugar to deal with, agitation with cold distilled water will soon produce a syrup of full density and good quality; with a less soluble one the application of heat becomes necessary. But it is better to add the sugar to the water already at the boiling point than to slowly heat the two up to that temperature, as is the usual method; we thus quickly obtain a concentrated solution and avoid the prejudicial influence of continued heat on a weak one.

Syrups containing acids are affected in the cold, but still more readily as the temperature increases. Some acids act more prejudically than others, but inversion to a greater or less extent always takes place. In 1874 Arno Behr published a table of the inverting power of acids on sucrose at various atmospheric temperatures, which being of considerable interest to pharmacists, I will here reproduce. The action of hydrochloric acid is taken as the standard at 100.

INVERTING POWER OF ACIDS ON SUCROSE.
(Arno Behr).

Acid.	211 hours 13°–17°C.	115 hours 19°–27°C.	78 hours 25°–27°C.
Acetic Acid . . .	1·2	1·3	1·6
Butyric "	...	1·9	2·5
Isobutyric "	...	2·2	2·5
Succinic "	...	3·5	4·0
Malic "	...	8·1	8·8
Citric "	8·2	9·2	10·2
Formic "	...	9·2	9·6
Lactic "	10·2	10·4	9·9
Tartaric "	11·4	13·4	13·8
Phosphoric "	24·2	25·8	26·9
Oxalic "	49·6	53·1	54·5
Sulphuric "	83·9	83·1	84·2
Hydrochloric "	100·0	100·0	100·0
Nitric "	100·1	100·4	100·1

It will be seen that acetic acid has the least, nitric acid the greatest, inverting power, and that phosphoric acid stands high in the scale.

The bottles from which syrups are dispensed should be well washed each time before they are refilled; or, to follow the example of some of our continental brethren, syrups, such as those of orange, lemon, etc., should when prepared be put into half pint or one pint bottles (quite full), and stored in a cool dry place with little if any light, one bottle being kept in the pharmacy for use and *replaced* not refilled, by another when empty, thus avoiding the admixture of the fresh supply with a small quantity of that which has been exposed to air and warmth for some time and which has usually undergone a partial change, otherwise the proverb that "a little leaven leaveneth the whole mass" is fully illustrated by the result. There are certain syrups which from being rarely used are sometimes found to be spoilt when required, such for example as syrups of saffron and roses. This difficulty can readily be overcome by making concentrated liquors from the saffron, roses, etc., respectively, filtering on to granulated sugar contained in a water-bath, and drying with frequent stirring at a gentle heat. These products keep well in closed bottles, and the syrups can readily be extemporized from them as required. There are doubtless several others which could with advantage thus be prepared, but the above are the only ones with which I have had any length of experience.

Sugar is not only useful in preserving the protosalts of iron as syrups, but added to the water in which they are precipitated and with which they are washed, it exercises a protective influence; this possibly arises from the fact that saccharated water holds less air in solution than pure distilled water, and although sugar, as I have mentioned, acts readily on iron in the presence of oxygen, it does not combine with its oxide or salts.

I wish these remarks to be regarded not as an attempt to exhaust the subject, but rather as giving some of the results of my experience, with a view of eliciting further information and stimulating inquiry into a subject which to my mind merits a larger share of attention than it has hitherto received.

———

Dr. Oxland said he spoke as an old sugar refiner, though he had been out of the trade for many years. It was quite as possible to obtain pure sugar in this country, and even in that particular town, as in any part of the world. On examining the sample of Say's sugar now exhibited, he had reason to believe that it was decidedly inferior to the best English sugars. English refiners considered it *infra dig.* to use ultramarine for producing a good colour, but this was constantly done on the continent, in order to disguise imperfections in the liquoring operation, which was the final washing in the centrifugal machine or otherwise, by which the last trace of impurities ought to be carried off. The fact of potash, silica and lime, having been found in the minute proportion referred to, would rather tend to show that ultramarine had been used. With regard to beetroot sugar, the very finest lump could be produced from it, and he had been the first to use it exclusively for that purpose in England. Before the employment of superphosphate of alumina as a refining agent in place of blood, only fifty per cent. of beetroot sugar, with an equal proportion of cane sugar could be used, but now the finest loaf sugar could be made from beet alone, and he did not believe it would be possible to detect any difference chemically between it and cane sugar; the crystals however were a different shape being about double as long as broad instead of being nearly square, and having one or two lines down the middle.

A vote of thanks to the author was passed. The next paper read was on—

The Proximate Principles of the Narcissus Pseudonarcissus.

BY A. W. GERRARD, F.C.S.

The natural order Amaryllidaceæ, to which the plant forming the subject of this notice belongs, has a reputation for producing many plants possessed of poisonous or active physiological properties; some are reported narcotic, others emetic and diuretic whilst *Hæmanthus toxicarius*, a native of Cape Colony, is stated to be used by the Hottentots for the purpose of poisoning their arrow-heads. As several of the Amaryllids are readily obtainable in this country, and our knowledge of their composition and physiological action being of a most meagre and unsatisfactory kind, I deemed them a matter worthy of investigation, more especially as Professor Sydney Ringer engaged to undertake physiological experiments with the substances I might obtain.

Narcissus Pseudonarcissus, or daffodil, is an early spring flower, well known by its funnel-shaped perianth and golden corona, growing uncultivated in many parts of England. All parts of the plant are reputed poisonous, especially the flowers. At the time I undertook its examination, bulbs only were obtainable; to these, therefore, my observations were confined.

My first experiments were made upon a few bulbs, and gave indications of the presence of a substance possessing the characters of an alkaloid, and likewise therapeutic properties of an interesting order. A supply of twenty-six pounds of daffodil bulbs were furnished me, and at once reduced to a pulp, then exhausted with 84 per cent. alcohol. From the tincture obtained the spirit was removed by distillation, and the residual extract having some oily looking substance floating on its surface was washed with ether; the ether removed and evaporated gave a residue of oil and resin, odorous, acid, and partly volatile.

The mother extract was now made alkaline with potassic hydrate, and again treated with ether. The ether layer decanted and allowed to spontaneously evaporate, yielded a yellowish brown viscous substance, the surface of which displayed several masses of crystals; these masses were half an inch in diameter and composed of extremely delicate needles radiating from a common nucleus; the reaction of the mass was alkaline. I was much pleased with its appearance and expected to find the crystalline matter an alkaloid, but in this I was disappointed, as the following experiments will explain.

A small quantity of water was added to the partly crystalline mass, and sufficient nitric acid to render it neutral; the crystalline matter remained undissolved, but imbedded in a blackish oily substance; and the separation of the crystals from the oily matter has defied my best efforts. Benzole, carbon disulphide, chloroform, and alcohol, each dissolved the oil, likewise the crystalline body; when the matter was shaken with water a few crystals disentangled themselves, but not in sufficient quantity for a proper examination. A few of the crystals obtained were placed upon a watch glass and treated with solution of caustic potash, which only dissolved them when warmed. A few crystals placed in the mouth appeared tasteless. The yield of this crystalline substance which I am inclined to regard as a neutral principle I should imagine was not more than five grains from the whole of the bulbs employed, and as I had now consumed it all in my experiments, I was compelled to discontinue its examination.

My attention was now directed to the nitric acid solution of the alkaline matter; it possessed a decided bitter taste, and gave, from moderately strong solutions, precipitates with phosphomolybdate of soda and nitric acid, tannic acid, iodohydrargyrate of potassium, perchloride of platinum, sulphocyanide of potassium, and solutions of potash, soda, and ammonia; with the latter it dissolved in excess. By these characters, therefore, I am able to establish the identity of an alkaloid, which, provisionally, may, I think, be termed pseudnarcissia. I have found it soluble in water, ether, alcohol, chloroform, and benzole, from none of which solutions has it crystallized, but formed a transparent yellowish brittle substance. The yield of this alkaloid is very small, about six grains from the pound of bulbs, but it must be borne in mind that fresh bulbs consist very largely of water, and that alkaloids very soluble in water are never completely extracted from their mother liquors by ether or like solvents.

The whole of the nitrate of pseudnarcissia being required for Professor Ringer's experiments, I was unable to carry its purification to a state of completeness, neither could I prepare its compounds with acids as I would wish to have done; a few drops of the nitrate solution placed upon a watch glass gave in about fourteen days some indifferent granular looking crystals.

After exhausting the parent liquor of its alkaloid soluble in ether it was further shaken with chloroform, which solvent extracted some resinous colouring-matter and a minute portion of alkaloid, which latter was soluble in ether, and therefore I concluded to be pseudnarcissia. The same experiment as this latter was repeated with benzole and carbon bisulphide as the solvents, but they gave no residues worthy of notice; these experiments were undertaken as a search for other principles, which ether might not have abstracted, and which the different physiological actions of the daffodil extract and alkaloid point out as being present.

After exhaustion of the bulbs with spirit they yield to water a sweetish viscous extractive, not reducing alkaline cupric tartrate in the cold, but doing so immediately on boiling. Spontaneous evaporation of a solution gave no crystals. Various reagents were applied to this substance but with no apparent effect except the following, which is especially worthy of notice. The extract made semi-fluid, with water and caustic soda added, formed a yellowish mass, no longer fluid but semi-solid, and on agitation a most powerful odour of acetous ether was evolved mingled with that of ammonia. The nature of this substance I cannot conjecture; I have plenty at my disposal and should be glad to hand it to any gentleman who would undertake its further examination.

Professor Ringer's experiment upon the physiological actions of the alkaloid and spirituous extract—which will be published in detail elsewhere—show, that on warm-blooded animals the alkaloid given hypodermically in doses of three or four grains causes profuse salivation, with running at the eyes and nose, also free vomiting and slight diarrhœa, the motions sometimes being slimy. On man it was administered by the mouth and found to act as on animals; sometimes the effects on the salivary glands are most marked, at other times it produces vomiting or diarrhœa, or both without salivation; dropped into the eye it first slightly contracts and then dilates the pupil.

The extract in some respects is far more powerful than the alkaloid; thus eight to ten grains excite nausea and vomiting but produce no salivation. Hence it is very probable that the principle producing the salivation and that producing the emetic and purgative action are distinct. These latter points will be, if possible, determined, and my efforts will also be further directed to preparing the alkaloid in a pure and crystalline form.

A vote of thanks was awarded to Mr. Gerrard for his paper.

Professor Attfield said that Mr. Atkins had sent in a paper on Pharmaceutical Ethics, which he would suggest should be read the following day, without being discussed lest they should get into questions of politics, which would be beyond the scope of the Conference. He would therefore take the opinion of the meeting whether this course should be adopted.

On the motion being put it was carried *nem. dis.*, and the Conference then adjourned.

Wednesday, August 15th, 1877.

The Conference reassembled at 10 o'clock, when the first paper read was, "A Glance at the Materia Medica of Devon," by E. Smith, F.C.S.

A Glance at the Materia Medica of Devon.

BY EDWARD SMITH, F.C.S.

I trust the title of my paper will not be misunderstood. It is not, of course, my intention, even were it possible within the limits of a short paper, to enter minutely into all the details connected with the various products of the county. Neither do I pretend to anything but a very incomplete knowledge of the subject. In this respect I must claim your indulgence, trusting that, as there must be many members present who have probably both a wider range of experience and more intimate knowledge of the county than I can lay claim to, some of you will fill up the gaps necessarily left open by giving us the results of your own observation and experience. I thought even a cursory glance at a subject of this nature might not altogether prove uninteresting to the many members attending the Conference from distant counties.

The pharmaceutical productions derived from the fauna of Devon are of the usual character. Taking the pharmacopœia chiefly as a guide we find mentioned in that work eggs, suet, milk, lard, cod liver oil, ox-gall, honey, etc. In eggs, suet, and lard, we have nothing special to offer. Our oxen are well known as "facile princeps" amongst their species, although our fel bovis is much as other ox-gall. Our milk does not differ materially from the general character of that secretion. It appears to have that singular affinity for water that seems almost to amount to a function. Our clotted cream perhaps deserves a special word. Devonians say you can't get cream out of Devon. But then the Cornish and Somersetshire folks say the same of their respective counties. It is, I believe, on record that a couple of weary travellers, having unwittingly crossed the border of Devon into Cornwall, and asking amongst other good things for a bowl of Devonshire cream, were supplied by the buxom hostess, much to the surprise of her visitors, with a mug of very attenuated milk. A vehement remonstrance brought out the truth, "Oh, you waants *Carnish* crame, I wandered at your askin for that puer Denshire stuff!" I am bound to say, however, that this Devonshire "stuff" is rather a toothsome tidbit, and especially so when strawberries are ripe. Although the cod-fish abounds on the Devonshire coast, I do not know of any important maker of cod liver oil. With regard to honey, the amount produced in Devonshire is not nearly so great as might have been anticipated. Many of the smaller farmers and cottagers possess hives, but only to a very limited extent. Considering the great and special advantages offered by the moorlands, it is, I think, much to be regretted that a production, capable of being readily developed into a profitable business, is not more cared for and cultivated. Some few years ago I made an attempt to collect the honey in the Chagford district, but I found the amount procurable was too small to enable me to enter into any satisfactory business arrangements.

Passing now to the flora of Devon, we find here more material to work upon.

Of the Ranunculaceæ, *Aconitum Napellus* is found in patches in various parts of the county, though not to such an extent as formerly. Some few years ago it flourished luxuriantly in Dartington Park, near Totnes, but it has now disappeared from thence, owing, I imagine, to the poisonous character of the plant having been discovered. It is still to be found on the banks of the Dart, especially near Stoke Gabriel and near Staverton.

Of the Papaveraceæ, *P. rhœas* is common in the cornfields and roadsides. *P. somniferum* is not found, so far as I know.

The Cruciferous plants are represented by *Cochlearia armoracia*, common in the gardens, and sometimes in waste places amongst garden refuse. The three mustards are fairly common. *Sinapis alba* grows luxuriantly on the limestone soils; *S. arvensis* is common in cornfields, and *S. nigra* in the fields and roadsides.

Viola odorata, of the Violaceæ, is found plentifully; a white flowered variety is fairly common.

Of the Linaceæ, *L. usitatissimum* is found pretty abundantly. It grew luxuriantly during the summer about a mile from Torquay on the Paignton Road, also on the "New Cut," Torquay, and is found also near Totnes and Exmouth.

L. catharticum has been gathered near Torquay, and is also met with near Brixham and Paignton.

Rhamnaceæ.—*Rhamnus frangula* is found forming a part of the shrubs of the hedgerows, near Paignton and Torquay. It is not uncommon in the Moreton and Tavistock districts.

Rh. catharticus is not, so far as I am aware, found in Devon.

Sarothamnus scoparius, of the Leguminosæ, abounds nearly everywhere throughout the county.

Of the Rosaceæ, *Rosa canina* is pretty ubiquitous in the county. *Potentilla tormentilla* is found frequently in heathy places about Dartmoor. *Prunus laurocerasus* grows luxuriantly in the gardens. In some parts of the county the fruit is collected by the poor people and eaten as a delicacy, notwithstanding that Bentley says "the fruit is poisonous." It is also made into a most delicious jam or conserve.

The most important Umbelliferous plants are *Fœniculum vulgare*, found plentifully on the railway banks between Paignton and Torquay, and on the roadside between

Teignmouth and Newton, and *Conium maculatum*, which grows abundantly in the lanes around Torquay, and many other places in the county. It may be gathered to an almost unlimited extent.

Caprifoliaceæ.—*Sambucus nigra* is the only medicinal plant of this order, and is common throughout the county.

Valeriana officinalis, of the Valerianaceæ, grows on the swampy ground near Watcombe, also in the neighbourhood of Newton, Tavistock, Plymouth, and other places.

The Compositæ are represented by *Anthemis nobilis*, a somewhat plentiful plant, being common near Torquay, Paignton, Milber Down, Bovey, and Tavistock.

Leontodon taraxacum is common everywhere. The roots of plants growing on limestone soils are not unfrequently dwarfed, and forked into several smaller rootlets, very unlike the strong robust roots I have often gathered in the midland counties and elsewhere.

Of the Solanaceæ, *Solanum dulcamara* grows in the hedgerows almost universally. *Atropa belladonna* is a very rare plant. It has been found, I believe, near Combe Martin, North Devon. I have not met with it in Eastern Devon. *Hyoscyamus niger*, on the contrary, grows most luxuriantly in many parts of the county. Near Torquay, at Paignton, Dartmouth, Slapton Sands, and other places, an almost unlimited quantity could have been gathered during the season just passed. The Pharmacopœia directs the leaves of this plant to be gathered "when about two-thirds of the flowers are expanded." Speaking now of the wild plant, I do not agree with this. My experience points to an earlier gathering. If the collection be left until the plant has partly flowered, by far the largest and best leaves have, to a great extent, withered and become yellow and unfit for use. An earlier collection saves all these. The resulting dried herb is, in my opinion, better in colour and in efficiency than if gathered later. Dr. Christison remarks, with respect to the activity of the leaves, "I have found them sufficiently active even in the spring *before* the appearance of the flowering stem."

Datura stramonium is but rarely met with. Last year it flourished in a field between Paignton and Totnes, but has not this summer appeared in the same place. Several years ago, a luxuriant patch grew near Stoke Gabriel on the Dart. This has since disappeared.

Scrophulariaceæ.—*Digitalis purpurea*, locally known as flap-dock, grows abundantly in every part of the county. In the woods near Moreton Hampstead it may be seen in most luxuriant masses, and when in bloom forms a charming addition to the landscape. The leaves of this plant should, I think, be collected before the plant begins to flower.

The three mints, *Mentha piperita, M. viridis, M. pulegium* represent the Labiates. *M. piperita* is found at Cockington, near Torquay, also at Ashburton, Chudleigh, and other places.

M. viridis is somewhat rare, found in marshy places around Exmouth. *M. pulegium* is found in swampy places, as Forde Bog, near Newton. This herb is called in the Devonshire dialect "organs" or "argans." The origin of this word I do not know. In a poem in the Devonshire dialect, published in 1867, these lines occur :—

"Jist put her tooties in hot watter,
An' gi'er a few strang *argans* arter,
Or else some featherfoul."

That is, "put her toes in hot water and give her a little strong pennyroyal tea after, or else some feverfew."

Daphne laureola alone represents the Thymelaceæ. It is found in the woods between Paignton and Totnes, and several other localities.

Cannabinaceæ.—*Humulus lupulus* is occasionally found, apparently wild, in the Cockington lanes near Torquay; it flourishes also at Goodington, Paignton, Brixham, etc.

Ulmaceæ.—*Ulmus campestris* and *Ulmus montana* are common throughout Devon.

Salicaceæ.—The various willows flourish abundantly throughout the county.

Cupuliferæ.—*Quercus robur* is very abundant in our woods.

Moraceæ.—*Morus nigra* is found cultivated in sheltered gardens in Torquay and neighbourhood.

Coniferæ.—*Juniperus sabina* also flourishes in many gardens and shrubberies as a cultivated plant.

Colchicaceæ.—*Colchicum autumnale* is a rare plant, at least in Eastern Devon. At one time it flourished near Torquay, but has now disappeared.

Filices. — *Lastrea filix-mas* flourishes luxuriantly throughout the county, and is a very common plant.

With regard to the Inorganic Materia Medica, I propose to restrict this paper to a notice of the *minerals* of Devonshire ; which are both numerous and important. For our purpose (and including in this those of more strictly chemical interest), they may be divided into two classes.

α. The rarer minerals, consisting of ores containing antimony, bismuth, cobalt, gold, tungsten, uranium, and mercury (?)

β The commonly occurring minerals, consisting of ores containing arsenic, sulphur, copper, iron, lead, silver, manganese, tin, zinc, barium, and the mineral kaolin.

α. Of the rarer minerals, antimony occurs in several parts of Devon, but only to a very limited extent. Antimonite is found near Bovey Tracey. It was worked for a short time, but the venture was not financially successful. Bismuth ores are occasionally met with, not in sufficient quantity, however, to become marketable.

Cobalt occurs sparingly in several localities. The largest yield on record from one mine occurred in 1820, when, according to Worth, "1700lbs. of ore of inferior quality were raised and sold from Wheal Huckworthy, near Sampford Spiney."

Native gold occurs, too, but in small quantities. It has been found in the beds of the Dartmoor streams, and also by Mr. Flaxman in the hæmatite of North Molton. The working of this hæmatite for gold turned out a financial failure.

Tungsten, in the form of wolfram or tungstate of iron and manganese, is occasionally met with in tin mines, accompanying the tin oxide, and owing to its high sp. gr. greatly impedes the operations connected with ordinary tin dressing. Uranium as pitchblende has been found near Tavistock in very small quantities only, not sufficient to become a marketable production.

I do not think mercury can rightly be considered as a Devonshire metal. A few years ago, some excitement was caused by the announcement in the local papers that mercury had been discovered in the rocks near Exeter. I was sufficiently fortunate to obtain a sample, which was undoubtedly metallic mercury. It seems, however, to have been thrown there, and I am afraid the whole thing was a hoax.

β. Of the commonly occuring minerals. Arsenic is found abundantly in many parts of the county, as arsenical pyrites, or arsenical mundic, or mispickel—arsenio-sulphide of iron. Until a comparatively recent period, arsenical pyrites was considered valueless, or nearly so, but the great demand for arsenic of late years has vastly stimulated its production. At the present moment something like 3000 tons of arsenious acid per annum are produced in Devonshire, the Devon Consols Mine alone producing from 150 to 200 tons a month, enough to destroy the lives of perhaps 500 or 600 millions of men. Almost any day there may be seen at this one mine, packed ready for sale, sufficient arsenious acid to destroy every living creature on the face of the earth—a somewhat startling reflection ! Of course comparatively little of this arsenious acid is used in medicine. As far as I can make out, large quantities are shipped to the continent, Germany chiefly, where I believe it is employed in the aniline colour manufactories. The arsenious acid is obtained from the mispickel by roasting the pulverized ore in a reverberatory furnace, with free access of air. The vapours are conducted into long, nearly horizontal zigzag chimneys, in which the arsenious acid is deposited as a grey or black powder. It is removed from time to time, and refined by resublimation. The sulphur which is evolved as sulphurous anhydride, at the same time, is generally allowed to escape into the atmosphere.

Sulphur occurs very abundantly in combination with iron, as iron pyrites or mundic, FeS_2. Mundic is not accounted of much value by the miner, and although it contains about 53 per cent. of sulphur, it is not, so far as I am aware, utilized to any great extent. The little used is employed for the manufacture of sulphuric acid and ferrous sulphate.

Copper.—This metal is found chiefly as sulphide and sometimes as oxide. It occurs very abundantly in some parts of the county. It is worked in the neighbourhood of Tavistock, Buckfastleigh, and North Molton. The ores of copper have, in all probability, been mined from the earliest times, yet it is only during the present century that copper mines have become a really important branch of national industry. Devon Great Consols Mine was, at one time, the most productive and profitable copper mine in Great Britain. On an original outlay of about £1000, the mine is said to have realized in twenty-one years over £1,000,000 sterling in net profits, the Duke of Bedford, as mineral lord, receiving in that period the princely sum of £200,000 in dues. This mine is still working, and although not yielding such profits, is making large returns, especially in arsenious acid. The total production of copper ores varies almost yearly, being greatly influenced by the market value of copper. None of the ores are smelted in Devonshire. They are simply "spalled" or dressed, that is the gangue or matrix partly removed, and then shipped, chiefly to Swansea, to be smelted.

Iron ores abound in many parts of Devon; the chief are hæmatite, chalybite, limonite, spathic or carbonate, magnetic oxide, and micaceous iron. Hæmatites are worked near Brixham, Sharkham, and Smallacombe, also at Hennock, and Chudleigh. A brilliant micaceous hæmatite raised at Brixham is ground with linseed oil into a paint and is largely used for covering iron work; it is commercially known as "Torbay paint," and is used by gas and water companies, and in several government departments. Spathic iron ore is found in the Teign valley. Micaceous ore occurs near Lustleigh; it was formerly, under the name of Devonshire sand, used as a pounce; its chief use now seems to be for mixing with graphite and as a lubricant. Magnetic oxide was worked years ago at Haytor, near Ilsington, but of late years it has been discontinued. Although Devonshire is comparatively rich in iron, the working of the mines seems to have lacked spirit and enterprise, or in some way to have been discouraged, for the total yield of all the Devon mines in 1874 was but 21,313 tons. Succeeding years have shown a falling off, even from this small yield.

Lead occurs chiefly as sulphide or galena. The Devonshire lead mines have been famous from the most remote times. They are said to have been worked by the Romans. There is a record of their having been worked, more particularly for the silver contained in the lead, in the reign of Edward I., and at that time were accounted profitable. The ancient silver lead mines of Combe Martin were re-opened in the time of Elizabeth, and after yielding enormous profits were again closed, to be within the last few years again re-opened with, it is said, satisfactory results. The Lord Mayor's cup is made of silver extracted from these mines.

Silver.—Native silver is found occasionally, but in small quantities only. The chief source is the argentiferous galena, some of which carries as much as 120 to 140 ounces of silver to the ton. In 1857, 50,000 ounces of silver were produced in the county, since which time the amount seems to have gradually decreased. Very recently a silver lode has been opened up at Wheal Newton, which promises to be exceptionally valuable, some parts of the lode are said to yield as much as 2495 ounces to the ton. A not inconsiderable amount of silver has, of late years, been obtained from a cupreous iron pyrites found in several places in the county. This ore carries from 2 to 4 or even 6 ounces of silver to the ton, as well as from 2 to 3 per cent. of copper. At New Consols Mine ranges of furnaces, lixiviating and precipitating tanks have been erected, and for some time worked to obtain the silver and copper. The process followed is an old and simple one. The ore is roasted with about 10 per cent. of salt to convert the metals into chlorides; it is next boiled with solution of salt, in which the silver and other chlorides dissolve. This solution after filtration is passed, whilst hot, into tanks containing scrap iron, which causes a deposition of the copper and silver in a metallic state, known as cement copper or silver. The silver is afterwards separated from the copper at the refineries in the usual way. Other processes have been devised whereby the silver and copper are deposited, separately, by galvanic agency.

Manganese is mined very largely in Devon. The grey and black oxide are the two ores worked, the latter—the binoxide—is by far the most abundant. It is found chiefly in the district around Milton Abbott. At times the ore is found in very grotesque forms, frequently having the appearance as though it had been fused. The ore undergoes a process of dressing, and is then shipped—chiefly to Glasgow—where it is in pretty constant demand. Devonshire yields by far the greater part of the native manganese of Great Britain.

Tin.—Although there are evidences of very ancient works indicating that tin has been mined from the remotest times, almost in every part of Dartmoor—the only part of the county where tin is found—yet the amount raised is very small as compared with Cornwall. The old stannary towns were Chagford, Ashburton, Tavistock, and Plympton. The three first are noted in a charter, dating about 1305, and the last was constituted in 1328. Up to this period, Devonshire appears to have been the principal tin yielding county, but shortly after this Cornwall took the lead, and still retains it. The only ore of tin raised is the binoxide, or cassiterite.

Zinc occurs as blende or black-jack in small quantities, in many mines, but the amount produced in Devon is exceedingly limited, and certainly not of commercial importance.

Barytes occurs as sulphate in several parts of the county. In the Teign valley it has been worked. Its use appears chiefly to be as an adulterant of white lead. The amount raised is comparatively limited.

Kaolin, the last of the minerals I have to notice, is derived from granite, is in fact the insoluble residue of the feldspar of the granite. Kaolin may perhaps not seem to have any very prominent pharmaceutical interest, still there can be no doubt that, as chemists, we are greatly indebted to this material in the matter of crucibles, evaporating dishes, and such like. But over and above this there is one paramount reason which induces me, in the midst of this gathering of eminent pharmacists, to especially emphasize this simple mineral kaolin, and yet not the kaolin, but the man who, in a generation gone by, discovered in this mineral and the moorstone commonly accompanying it, the material which forms the basis of all true porcelains, and that man was a chemist and druggist, a native of Devon, and a citizen of this very town of Plymouth in which we are now assembled. I cannot do better than give you Worth's * account of this worthy Devonshire pharmacist, by name William Cookworthy. Cookworthy "was born at Kingsbridge, April 12, 1705, and his father, who was a weaver, died when he was a lad, leaving his family in straitened circumstances. Young Cookworthy was apprenticed to a firm

* 'Transaction of the Devonshire Association,' 1876, vol. viii., page 481.

of druggists in London named Bevans; and it is stated that, in consequence of want of means, he had to walk to London to enter upon his duties under that firm. He won the esteem of his employers, becoming not only an able man of business, but an accomplished chemist, and by the aid of the firm established a wholesale drug business in Notte Street, Plymouth, at first under the style of Bevans and Cookworthy. With this firm, which, subsequently, on the admission of his brother Phillip as partner, became that of William Cookworthy and Co., Cookworthy remained connected until his death in October, 1780. He was in many respects a remarkable man, and his life is one of the most illustrious examples of men who have risen, of which even England can boast. Emphatically self-made, he had none of the foibles which frequently mark the characters of those who have been the architects of their own fortunes. An industrious man of business, a shrewd and painstaking inventor, deeply versed in the science of the day, valued in society for his geniality and power of conversation, he was at the same time, one of the simplest and devoutest of Quakers, and an enthusiastic believer in the views of Swedenborg. He was withal most absent-minded, and on one occasion, while on his way to a meeting at Exeter, was so engaged by a novel which he found on an inn table, that he never reached his destination. Yet he was, in the words of Sarah Champion, an 'eminent minister' in the Society. His benevolence was as abundant as his charity was extensive, and he had 'originality of character,' and 'a lively entertaining manner.' He was a firm believer in the divining rod, and left a treatise on its uses. In short, Cookworthy was a man of many sides, but always genial, courageous and persevering; a man who won the respect and esteem alike of high and low by his strict integrity, wide sympathies, and varied powers; one who, having set his hand to the plough, was not ready to turn back. And this was the man who, not by accident, but by patient, well-directed research, prosecuted during his business journeys, first discovered in this kingdom the existence of the china-clay and china-stone—the kaolin and petunste—which are the necessary ingredients of true porcelain; and then, not having, like Wedgwood, been bred a potter, taught himself the potter's art, and by careful study and long protracted experiments, extending over many years, reproduced in England the hard porcelain of the East, the secrets of whose manufacture he had thus attained, and gave to his country new forms of industry and new sources of wealth."

Since Worth wrote this, a stained-glass window has been placed in the new Plymouth Guildhall, to commemorate not the least one of Devon's worthy sons, and one, who in a sense is connected with ourselves, in that, like us, he was a working pharmacist, but of a generation gone to its rest.

May we, especially those amongst us who claim to be of his county, stimulated by his noble example, seek to emulate the earnestness of spirit, which seems to have pervaded his innermost nature, and prove ourselves the worthy successors of this persevering, genial, sympathizing, and illustrious Devonshire pharmacist.

The PRESIDENT in proposing a vote of thanks to Mr. Smith, said this paper was a very interesting one, and it was very important in visiting the different parts of the country that the Conference should have such information brought before it as to the materia medica of the different districts.

Mr. GROVES asked if the use of the fruit of the *Prunus laurocerasus* as a preserve was at all common in Devon.

Mr. SMITH did not think it was general except in one district. He had had jam made from it from the neighbourhood of Bridford and enjoyed it immensely.

Mr. EKIN said there was a market for any amount of willow bark containing salicin, and he should like to know if any species containing it was found in Devon. Many willows did not contain any, and the one containing most was the *Salix pentandra* which was properly a northern willow; he did not know whether it had wandered down to the Devonshire moors.

Mr. COTTRELL (Shepton Mallett) thought the term "organs," did not come from any of the mints but from the wild thyme or origanum. The oil of pennyroyal was very much used in Somersetshire amongst the working classes.

Mr. SMITH said he had not much experience in willows, but he believed they nearly all grew in Devon. With regard to the word organs, it had been suggested to him before that it was a corruption of origanum.

(*To be continued.*)

Parliamentary and Law Proceedings.

ALLEGED POISONING BY TOBACCO OIL.

Dr. Thomas, deputy coroner for Central Middlesex, held an inquiry on Tuesday at the Dartmouth Arms, Dartmouth Park, as to the death of Arthur George Stevens, aged three, of 4, Spenser Road, Highgate Rise.—The father said that on Saturday week deceased was playing in the yard with other children, who were blowing soap bubbles in the air. He gave deceased a new clay pipe, which he soon broke, and returned for another. He then took down from a shelf, where it had been more than a year, the old wooden pipe now produced, which he washed, and handed to the deceased. In an hour's time deceased became sick and vomited very much, afterwards becoming very drowsy, and deadly pale. On Sunday he was worse, when castor oil was administered, and he was put to bed. After a very bad night he was much worse, and on Monday evening witness went to Dr. Rawlins's surgery, and after stating the symptoms received medicine and a powder. The deceased was seen by Dr. Rawlins on Tuesday afternoon, and twice on Wednesday, when the symptoms were much aggravated. The child continued to grow worse, and died at ten on Wednesday evening.

Dr. Rawlins, of Highgate Road, said deceased was suffering from narcotic poison when he first saw him, and the death was undoubtedly from imbibing nicotine contained in the old wooden pipe which the deceased had sucked whilst blowing soap bubbles. Two drops of pure nicotine—the concentrated essence of tobacco—would kill a man, one drop would kill a large dog, and a very small quantity would be sufficient to kill a child.

A verdict in accordance with the medical evidence was returned.—*Standard.*

Obituary.

Notice has been received of the death of the following:—

On the 9th of February, 1877, Mr. William Knowles, Chemist and Druggist, Thorne, Yorkshire. Aged 81 years.

On the 14th of August, 1877, Mr. Joseph Roake, Chemist and Druggist, Shillington, Bedfordshire. Aged 61 years.

On the 3rd of September, 1877, Mr. John Badcock, Pharmaceutical Chemist, Barnard Castle, Durham. Aged 54 years. Mr. Badcock was one of the earlier Members of the Pharmaceutical Society, having joined in 1844. He was a native of Launceston, and succeeded to the business of Messrs. Monkhouse and Sons, of Barnard Castle, in 1845. An ardent politician, he was chairman of the local liberal association, and in that capacity presented an address to Mr. Gladstone on the occasion of his visit to Raby Castle last year. Mr. Badcock was a member of the Local Board of Health, and also served his fellow townsmen with acceptance in various other ways.

BOOKS, PAMPHLETS, ETC., RECEIVED.

CHEMICAL HANDICRAFT. A Classified and Descriptive Catalogue of Chemical Apparatus, suitable for the Performance of Class Experiments for every Process of Chemical Research and for Chemical Testing in the Arts. Accompanied by Copious Notes. By JOHN JOSEPH GRIFFIN, F.C.S. Illustrated. London: Griffin and Sons. 1877. From the Publishers.

SELECT PRACTICAL NOTES AND FORMULÆ relating to Pharmacy, Materia Medica, Chemistry, Therapeutics, etc., with Hints on Dispensing. By W. CANNING. London: J. Davis. 1877. From the Author.

Dispensing Memoranda.

We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be conidered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.

[23]. GARGLE.—Rub the alum with ℈ij of gum acacia, then add the tincture of myrrh and triturate; lastly, add the water gradually. After standing three days the only separation is a slight brown sediment which does not adhere to the glass.

W.

[23]. No 2. First pour into the right sized bottle half an ounce of distilled water, and shake so as to wet all the inner surface of the glass; immediately thereafter add the tincture (previously measured), and agitate thoroughly, then gradually dilute the mixture with more water (shaking on each addition), until the proper quantity be reached. Lastly, add the potassic chlorate and dissolve.

No. 1. The same *modus operandi* as the above would produce a tolerable mixture in this case, but only temporarily, for soon a flocculent precipitate appears (both floating and sedimental), which cannot be diffused through the liquid by any amount of agitation; hence a slight modification is desirable in order to yield a satisfactory result. An elegant mixture may be made by using a small quantity of mucilage—ʒij mucil. acaciæ will suffice for this formula—triturating in a mortar, adding the aromatic water in successive portions, and, finally, dissolving the salt in the full proportion of fluid. Such a simple addition cannot interfere with the intentions of the prescriber, but is almost requisite to effect a presentable mixture, although it seems strange that myrrh should require a mucilaginous vehicle to suspend it more than guaiacum, considering the former contains in its composition much more gummy matter than the latter.

J. B. L. MACKAY.

[24]. PILL COATINGS.—First varnish with a solution of some resin in ether, then moisten with a very weak syrup, and roll in finely powdered French chalk.

FELIX STEVENS.

51, *Judd Street, W.C.*

[25] EMP. CANTHARIDIS.—It is not correct to paint the surface with a vesicating liquid unless ordered by the prescriber.

F. S.

[25]. EMP. CANTHARIDIS.—The manner of spreading a blister is merely a matter of taste or usage. There are various ways of leaving the surface, each of which can boast of some superiority over the others, according to the opinions of those who practise a special course; *e. g.*, some apply it to the skin smooth, others cover it with tissue paper and rub a little camphorated oil over the top. Another prevalent custom is to sprinkle pulv. cantharidis on the surface, whilst many recommend a few drops of liquor epispasticus to be poured on, and a few advocate the use of both the latter adjuncts. In my opinion the second way is the best. I prefer it because it possesses the following advantages:—1. The blister produced is clean. 2. It is less painful and more easily healed than in the case of the others. 3. The preparation is sufficiently active, even through the paper, if applied long enough. The addition of the loose powder often causes much needless irritation, owing to the minute particles of flies getting under the cuticle should the pustules break, and then the skin remains long abraded.

J. B. L. MACKAY.

[26]. UNG. HYOSCYAMI.—In answer to E. Bevan's inquiry respecting ung. hyoscyami, I beg to refer him to Beasley's 'Pocket Formulary,' where the following recipe is given:—

Fresh Henbane Leaves, bruised . . .	℔ij.
Olive Oil	℔iv ℥ix.
Wax	℔j ℥iij.

Digest for some hours, boil for a quarter of hour and strain.

F. J. BROOKES.

[26]. UNG. HYOSCYAMI is ordered in the Pharmacopœia of the Bristol Royal Infirmary as under:—

℞ Hyoscyami Foliorum Contusorum . .	℔j.
Adipis Præparatæ	℔iss.

Boil till the leaves become soft, and squeeze the product through linen.

W. GARDNER.

Bank, Barnard Castle.

Mr. Botwood and Mr. Stevens also send the above formula. Mr. Stevens remarks:—"There is also a compound ointment containing opium, acetate of lead, and powdered galls added to the above."

[26]. There is a receipt for this ointment in Beasley's 'Pocket Formulary' (1872), but it would be rather troublesome to make it on the small scale after that fashion. It might, however, be extemporized thus—

℞ Extracti Hyoscyami	gr. vss.
Unguenti Simplicis	℥i.

Misce secundum artem.

This gives a nearly equivalent strength, and would doubtless prove equally efficacious.

J. B. L. MACKAY.

[27]. AQ. CAMPH. CONC.—Please oblige by giving me a formula for preparing "Aqua Camphoræ Conc." 1 to 7 or 1 to 15. I believe such a preparation is supplied by the wholesale houses, and observe one person makes Aqua Camph. Conc. 1 to 40. I have been looking in some back numbers of the Journal, but cannot find it.

T

[28]. I should be obliged by some one informing me whether it is possible to make a lotion containing plumbi acet. and sulph. precip. (say about 1 of each in 50 or 60 parts of lotion) so that the precipitate shall lie in a compact mass at the bottom of the bottle, and when shaken up form a smooth looking mixture. All my attempts to form such a compound have resulted in the precipitate forming in a light pulverulent form, which on being shaken up floats in fragments in the water, and has a very ugly appearance.

J. Brookes.

Notes and Queries.

[553]. NON-CORROSIVE BLACK WRITING INK.—Would some subscriber favour me with a really good formula for above, inexpensive, permanent, non-corrosive, that will dry readily and flow freely? I have tried many published formulæ, and found none satisfactory in all particulars.

Quercus.

[554]. FLEXIBLE COATING FOR WOUNDS.—I am also anxious to obtain a formula for a flexible wound protecting fluid containing benzoin and, if possible, no ether.

Negator.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Composition of Essential Oils.
The Conference Grants.

Sir,—I was unable to be present at the late meeting of the Conference, I should like, therefore, to clear up certain misunderstandings which, from the report I have just read, seem to have existed at the meeting upon the subject of my paper.

My experiments throughout have been intended to assist in the elucidation of the question, as to the chemical constitution of the various natural terpenes, as well as to ascertain what ground there is for assuming, as hitherto, the existence of so large a number of physical isomerides or varieties of the hydrocarbon, $C_{10}H_{16}$. For the moment, at least, I am not concerned with the other constituents of essential oils or only in so far as these present themselves incidentally.

It is explained in the paper itself that I have prepared from many of the terpenes certain substitution compounds by the study of which I hope to obtain evidence bearing upon the question.

Almost from the time when Liebig invented organic analysis the composition of turpentine, lemon, and similar oils has been known, and more than forty years ago the vapour density of these hydrocarbons was determined by Dumas. Mr. Kingzett's announcement that he had "demonstrated the existence of a terpene of the formula $C_{10}H_{16}$ in the oils of caraway, bergamot, lemon, etc.," is therefore superfluous. It ought not to be forgotten, moreover, that it was Oppenheim who first showed in 1871, that the terpenes in turpentine and lemon oils are converted, by removal of H_2, into one and the same cymene. Since then cymene has been prepared from various other terpenes by Dr. Wright, and has been shown by him, in conjunction with Dr. Gladstone, to have invariably the same boiling point and refractive index.

For reading my paper, or a portion of it, I presume I am indebted to my friend Professor Attfield. It is strange that he should have overlooked the express statement that I had examined the cymene from cummin oil sent to me by Dr. Wright, and that I found it destitute of rotatory power. As to the existence of several varieties of cymene I have not myself encountered any but the ordinary kind which is inactive upon the polarized ray. But it is stated by Guareschi, also by Pisati and Paterno, that cymene from oil of cumin is dextro-rotatory.

One word in conclusion about the grants of money made by the Conference. For myself I can say that it was only after repeated invitation to do so that I consented to make an application which certainly never would have been made had I supposed the vote would have met with any sign of disapproval from the general body of members. I refer to this matter not with the view of defending Mr. Muir, but because I feel myself in the same position as that gentleman, and the representations made by Professor Attfield at the meeting apply to my case equally with his.

The Conference it seems to me is stultifying itself if, by awarding a grant of money it first stamps a particular question as one worthy of investigation and then manifests dissatisfaction when the answer is presented.

William A. Tilden.

Clifton, September 10, 1877.

Castor Oil Pills.

Sir,—Is it not time that this piece of deception was done away? Its advocates say that the public are not deceived. I know better—they are. There can be no question that the originator of these pills intended the public to believe the pills were actually what they were called. I have set my face against them from the first, and when applied to for them have assured my customers that the efficacy of the so-called pills was not produced by any castor oil they contained; that it was as impossible to put me into a pint pot, as to put sufficient castor oil into two or three pills to purge. On such occasions I have seen my customers with a contemptuous glance—as much as to say, "you are not up to your business"—turn round and walk off, I suppose, to another druggist more willing to lend himself to the deception.

There is not another business which can be so entirely carried on in an honest and honourable way as ours; why should we lend ourselves to barefaced fraud, when there is really no temptation to do so?

A Druggist for nearly
Half a Century.

H. P.—The books which are the subject of your inquiry were published thirty years since and are now out of print.

"*Negator.*"—*Depilatory.* A strong solution of sulphuret of barium made into a paste with starch, applied to the hair and allowed to remain five or ten minutes and then scraped off with a knife.

R. S. T.—The quantity of citric acid obtainable from lemon juice varies with the quality of the juice. First class juice contains about 12 ounces per gallon. See Mr. Warrington's paper on the Manufacture of Citric Acid, *Pharm. Journ.* [3], vol. vi., p. 768.

J. Wearing.—(1) Phosphorus is not a poison within the meaning of the Pharmacy Act, 1868. (2) Communicate with the Registrar upon the subject.

T.—Your communication shall be forwarded to "Subscriber."

W. Greig.—*Salicin.*—Erdmann's process is as follows:—Sixteen ounces of the bark are macerated twenty-four hours in four quarts of water, mixed with two ounces of lime, and the whole is then boiled for half an hour. The process is repeated with the residue. The decoctions having been mixed and allowed to clear by subsidence, the clear liquor is decanted, concentrated to a quart, digested with eight ounces of bone black, filtered and evaporated to dryness. The residue is exhausted with spirit containing 28 per cent. of alcohol, and the tincture evaporated to crystallization. The impure salicin is again dissolved, treated with animal black and recrystallized. Erdmann in this way obtained 300 grains of salicin from 16 ounces of *Salix pentandra* bark.

Communications, Letters, etc., have been received from Mr. Smith, Mr. Siebold, Mr. Edden, Mr. Crook, G., T., Verity, Syrupus, Country Dispenser.

THE ACID OF WILLOW BARK.

BY D. B. DOTT.

The chemistry of the willow seems to have been little studied, and what attention it has received has been almost entirely devoted to its active principle, salicin. All the information I have been able to obtain regarding the constituents of the bark is very meagre, the majority of works on chemistry and materia medica merely mentioning that salicin is extracted therefrom; while, curiously enough, the 'Pharmacographia' of Flückiger and Hanbury omits all notice of the subject. Neligan states (authority not given) that the bark contains resinous matter, gum, chlorophyll, tannin, an organic salt of magnesia, and salicin; and that is as complete an account as I have found in any of the other books.

When an infusion of willow bark is made the liquor is distinctly acid to litmus. In the preparation of salicin by Erdmann's process this acid is neutralized by the excess of lime, and the salt thereby formed passes into solution. On evaporating to dryness and exhausting the residue with spirit the salt is redissolved and remains in the spirituous solution after the salicin has crystallized out. The salt may be obtained by distilling off the spirit and allowing the residue to crystallize. These crystals are then purified by recrystallization from water. Thus prepared the lime-salt separates in the form of a cauliflower-like mass composed of radiate groups of prismatic crystals.

A portion of these crystals when heated fused, and inflamed, left a residue of calcic carbonate, indicating an organic salt of lime. It was found that the substance lost weight but slowly in the exsiccator, and likewise in the water-bath. A portion of the air-dried salt was therefore dried in the air-bath at 130° C. 9·140 grs. lost 2·745 grs.=30·03 per cent. In another determination with a different crop of crystals 7·85 grs. lost 2·275 grs.=28·98 per cent. A quantity of the salt was then incinerated in a platinum crucible, the residue being treated with excess of sulphuric acid and the crucible again ignited. 6·41 grs. gave 4·00 grs. $CaSO_4$=1·176 grs. Ca=18·34 per cent. In the second determination 6·12 grs. gave 3·82 grs. $CaSO_4$=1·12 grs. Ca=18·35 per cent.

One or two methods for preparing the acid were tried, the following being the process finally adopted:—To a solution of the lime-salt in water solution of oxalic acid is added—not in excess. The precipitate is then separated by filtration, the filtrate concentrated and extracted with ether, which dissolves the acid. The ether being now driven off, a syrupy solution of the acid is left. A few ounces were prepared by this method and placed over sulphuric acid under a bell-glass for two days. The acid then remained in the form of a syrup, almost odourless, with an intensely sour taste. As in these respects it exactly resembled lactic acid, and seeing that the calcium salt in its crystalline form and in its percentages of H_2O and Ca corresponded with calcic di-lactate, there could be little doubt that the acid under examination was lactic acid. To make more certain, however, some further tests were applied. A little was heated in a test-tube, when water and carbonic anhydride were given off, and a residue left which shortly solidified. A portion was then boiled with sulphuric acid, which liberated an inflammable gas burning with a blue flame—no doubt, carbon monoxide. When a small quantity was heated with sulphuric acid and manganese dioxide, a vapour smelling like aldehyde was evolved. A portion of the acid was distilled and the fraction coming over above 130° C. was evaporated and treated with cold alcohol, which separated small white crystals having the form of rhomboidal plates, and in other respects resembling lactide.

From the acid as above obtained the zinc-salt was prepared by warming with excess of zinc carbonate, filtering, and allowing to crystallize. The crystals were pressed between blotting paper and exposed for a short time to the air. In these air-dried crystals the H_2O was determined by drying in the water-bath; 6·065 grs. lost 1·125 grs.=18·46 per cent. In a second determination with another crop of crystals 9·275 grs. lost 1·695 grs.=18·27 per cent. The zinc was determined in the dry salt by ignition in the blow-pipe flame; 6·33 grs. gave 2·12 grs. ZnO=33·49 per cent. In another determination 7·58 grs. gave 2·55 grs. ZnO=33·64 per cent.

The above numbers are here compared with those calculated for the normal calcium and zinc salts of lactic acid respectively—

$Ca(C_3H_5O_3)_2,5\,H_2O$.

	per cent	Found. I.	II.	mean.
H_2O . .	29·22	30·03	28·98	29·505
Ca . .	18·34	18·34	18·35	18·345

$Zn(C_3H_5O_3)_2,3\,H_2O$.

	per cent.	Found. I.	II.	mean.
H_2O . .	18·33	18·46	18·27	18·36
ZnO . .	33·38	33·49	33·64	33·56

The ZnO is too high, owing either to an impurity in the salt or to a fault in the analysis; but I had not time to examine into the matter. The zinc-salt crystallized in four-sided truncated prisms, which were insoluble in alcohol.

I am unable to state from what species of *salix* the acid was prepared but as all the samples of bark I have examined give acid infusions, it is not improbable that lactic acid exists in all the members of the Salicaceæ.

SOME EXPERIMENTS ON THE PHYSIOLOGICAL EFFECTS OF COCA.*

BY E. B. SHUTTLEWORTH.

In introducing this subject it will not be necessary to enter into any account of the effects of coca as observed by residents and travellers in South America. Detailed statements are to be met with in many well-known books of travel, and of late, have been frequently collected together and published. It may be noticed that all authorities agree that coca is a most powerful drug, and that, for ages, it has proved to the native Indian tribes an incalculable blessing. At the present time, in South America, the annual consumption of the leaves cannot fall short of 100,000,000 pounds—a fact in itself sufficiently suggestive and conclusive.

Of the effect of coca on English-speaking people, in Europe and America, the evidence is not so satisfactory. Some experiments have been made, and reported, in which the drug has apparently fulfilled the expectations which were entertained regarding it; while, on the other hand, it has as often been condemned as useless, and, perhaps,

* From the *Canadian Pharmaceutical Journal*, August, 1877.

inert. The statements of Sir Robert Christison, as given in his address before the Botanical Society of Edinburgh, may be taken as representing one side of the case; those of Weston, the pedestrian, the other. In both the evidence is strong but contradictory.

During the past year, and part of the present season, an opportunity has been afforded of testing the merits of coca on a somewhat extensive scale. In the spring of 1876, a number of gentlemen connected with the Toronto Lacrosse Club commenced using coca with a view to the prevention of the fatigue incident to a game of which violent bodily exertion forms so large a part. The result was so satisfactory that fifteen o sixteen players, nearly all connected with the "first twelve," used the leaves at all the important matches played during the season. These were some ten in number, and sometimes lasted for many hours. As this club held the championship of the world, and maintained it throughout, against all comers, Indians and white men, it may well be imagined that the play was of no light character, and that the games were very hardly contested. At one of these, which took place in the middle of summer, the effects of the drug were very strongly marked. The day was exceedingly hot, the thermometer marking 110° F. in the sun. The antagonists of the club were men of sturdy build, of good physique, well trained in the game and, in general, connected with the mechanical trades, or with out-door avocations. In the latter particular they were in strong and apparently unfavourable contrast with the players of the Toronto club, whose occupations were all of a sedentary character. However, at the close of the day, during a short interval of rest between the games, I remarked that the men of the rival club were so thoroughly exhausted that it was with the utmost difficulty they could be roused by their field captain to take part in the concluding game, while the coca-chewers were as elastic and apparently as free from fatigue as at the commencement of play.

Before referring to the statements of the players themselves, I may explain that such evidence may be accepted with confidence, as emanating from gentlemen capable of forming correct conclusions. Without individualizing or making personal references, I may say that all the experimenters belong to the most respectable class of society, are educated and intelligent, and several of them occupy high professional positions.

At the commencement of every match, about a drachm to a drachm and a half of the leaves was served out to each man. This was chewed, in small portions, during the game, the saliva being, of course, swallowed. On first taking the leaves a sensation of heat and dryness was produced in the throat. This was relieved by washing out the mouth, or gargling with water, after which the desire for water was no greater than usual. Soon after, a sensible augmentation of muscular force, and a general feeling of invigoration were realized, and continued to be felt throughout the game, so that fatigue was wholly, or in great part, resisted. The pulse was observed to increase in frequency, perspiration was augmented, but no mental effect was noticed, save the exhilaration of spirits always attendant on the exercise of well-strung muscles, and on the excitement of play. No disagreeable after effects were realized. The leaves were chewed without the addition of lime or other alkaline matter.

As a summing up of the trial, extending over nearly a year and a half, I may say that the majority of the experimenters are strongly in favour of coca—some most enthusiastically so—while two or three out of the number remain indifferent, having derived no direct or apparent advantage from its use.

An athlete connected with the gymnasium in this city is in the habit of taking coca occasionally, and with great benefit. At a recent exhibition he administered to a companion a quantity of the leaves. These were chewed carelessly, and without much thought or faith as to the effect. The invigorating qualities of the dose were such as to wake the curiosity of the patient, who afterwards declared that not only was he free from fatigue, but that during the exhibition he felt unusually elastic and strong.

During the last seven or eight years I have often tried the effects of coca, both on myself and other persons, and I am inclined to think that the drug may be classed in the same category with tea and coffee, but that its effects are more strongly marked. This view has also been advanced by Dr. Pigeaux, of Paris, who made many experiments with fresh leaves submitted to him by the Society of Acclimatization. He, however, observes that he found it less exciting to the nerves than either tea or coffee, but its action over the heart is twice that of the latter and four times that of the former. Mons. Colpaert says that the brain is also affected. Persons using coca for a great length of time, and in excess, are ultimately reduced to a complete state of mental imbecility or idiotcy.

In South America, particular care is taken to procure the leaves in as fresh a state as possible, and many writers have ascribed the want of effect to the use of old leaves. I have no doubt but coca deteriorates by age, as will also tea and most medicinal leaves; but I am certain that it does not become wholly inert, if preserved with care. I have now in my possession a quantity of coca which I know to be at least eight years old, and it will still produce its characteristic effect. The leaves used by the lacrosse players were as fresh as they could be obtained in New York, where the price is about two dollars a pound.

Coca may be substituted for tobacco by those who chew the latter, and the habit may be thus conquered without great discomfort. I much question, however, whether such a change would be advisable, and know not which would be least injurious. I am, however, confident that coca has uses to which it may with advantage be put; and though I do not for one moment encourage or countenance any idea in favour of the continued use of the drug, and I should be very sorry to be instrumental in furthering its introduction for such a purpose, yet, I think that on certain occasions, as those indicated, it will undoubtedly prove useful.

COMPOUND OF THYMOL AND QUININE.*

BY C. PAVESI.

The author reports that he has obtained a crystalline compound which he calls citro-thymolate of quinine, by treating quinine with thymol and a small quantity of citric acid. Four parts of quinine are placed in a matrass or flask with 6 parts of oil of thyme and a sufficient quantity of alcohol to effect complete solution. The mixture is heated in a water-bath for a few minutes, afterwards allowed to stand during twelve hours, and then 2 parts of citric acid in powder added. The whole is again heated, filtered, and the liquid evaporated to a syrupy consistence. Upon cooling, a yellow matter is deposited in confused crystals. This substance is treated with boiling water and animal charcoal, filtered and evaporated at a low temperature; after twenty-four hours the salt is obtained well crystallized.

This crystalline compound of quinine, thymol and citric acid, is very white, moderately soluble in cold water, more soluble in boiling water, and very soluble in alcohol. It has a very bitter taste recalling that of oil of thyme. The presence of the three constituents in the crystals can be demonstrated by the use of suitable reagents; but the exact composition has not been determined by the author.

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* *Journal de Pharmacie* [4], vol. xxvi., p. 64, from the *Annali di Chimica* for January, 1877.

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 22, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

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THE BRITISH PHARMACEUTICAL CONFERENCE.

AT the Bristol meeting of the British Association Mr. VERNON HARCOURT complimented the British Pharmaceutical Conference on the position it had then attained, and spoke of its 'Blue List' in terms of praise. The Conference had earned this reputation not entirely nor even mainly by reason of its purely pharmaceutical contributions, but chiefly through the reading and publication of papers upon chemical subjects possessing much valued interest to the pharmacist. Scientific chemists were invited to become members of the Conference, and to accept grants to assist them in undertaking investigations stated to be required in the 'Blue List.' Heartily was the response made to the invitation, and a goodly amount of honest scientific work has been presented annually and in an increasing amount to the Conference. Murmurings of discontent have of late been floating in the pharmaceutical atmosphere; it is stated that the papers read at the Conference are too scientific, and more fit to be read at Burlington House than elsewhere; the active workers have accepted grants, and have contributed papers having, it is said, no interest for pharmacists. These signs of discontent made their first official appearance in some remarks made by the senior Secretary at the last meeting of the Conference. He thought that as the Chemical and Royal Societies were now making grants of money in aid of research, the Conference might discontinue to do so for purely chemical investigations. Hardly consistent with this, however, was the partially revealed request of the same gentleman that the "luminous constellation forming the committee" would continue their researches on aconitines at the expense of the Conference. Surely this subject has as little meaning or pharmacy as any of those embraced in the list at the Plymouth meeting. We say "as little" advisedly, because we contend that with few exceptions the whole of the papers were on subjects of an importance to pharmacists not to be slightly regarded. Let us go through them briefly and make this observation clear.

Mr. HOWARD'S paper possessed no practical interest to the pharmacist; it only dealt with a subject of an educational aspect, viz., the possible substitution of cinchonidine for quinine in medicine.

The papers on aconite by the "luminous constellation," and Dr. PAUL and Mr. KINGZETT concerned a subject of at least vital importance to the pharmacist, if a knowledge of drugs and their properties have any meaning at all to druggists.

Cayenne pepper is a substance both used and sold by pharmacists, and it cannot be otherwise imagined than that a knowledge of its proximate principles is acceptable to them.

The papers on essential oils by Dr. TILDEN and Mr. MUIR at least find their justification in the fact that the subjects were proposed by the Conference itself. The chemistry of essential oils must be well known before methods of detecting adulteration can be elaborated. We confess, however, that Mr. MUIR might have condensed the details of his vapour density determinations.

Pharmacists lay claim to some knowledge of botany and the chemical constitution of plants, and therefore the contributions on ivy leaves and products derived from them must have been welcome to the members of the Conference.

The "Assay of Opium" is a matter more affecting the professional chemist than the pharmacist; nevertheless, facts are always brought forward in such papers which have some value even to pharmacists.

The impurity which was described as found present in a sample of oxide of zinc is one against which too much guard cannot be taken.

Dr. SYMES' contribution of "Sugar in Pharmacy" was purely of pharmaceutical interest, while the paper on Narcissus Pseudo-Narcissus might have been valuable if it had not been premature.

Again, Mr. SMITH'S paper on the Devonshire materia medica, Mr. SCHACHT'S "Experiences of a Pharmaceutical Laboratory," and Mr. THRESH'S report on the "Pill Masses of the B. P." were eminently pharmaceutical in kind.

The note on diphenylamine as a test for nitric and nitrous acid was illustrative of facts well worth knowing, while Dr. TILDEN'S paper on "A Product of the Oxidation of Barbaloin and Socaloin," completed the study of a subject previously brought before the Conference. The research embracing the "Physiological Action of Copper present in Preserved Peas," brought forward by Dr. PAUL and Mr. KINGZETT, affected the public health and the teaching of pharmacists, and hence its fitness for the Conference could not be disputed.

Professor ATTFIELD'S paper, although previously published, had an interest, but—he will pardon us for saying it—one as remote as any of the papers read, for pharmacists.

One of the questions on the 'Blue List' of the Conference deals with the stated presence of an alkaloid in scammony root. The paper on this subject read at the Conference, negatived this assertion, and brought new light to bear upon the chemistry of scammony root generally.

Mr. GREENISH's note on "Tea Hair" contained some interesting facts, while Mr. SIEBOLD's paper on "Copaiba Testing," embraced a subject which has often been discussed by pharmacists.

Albumen is used by pharmacists for clarifying many decoctions, and hence a new process for bleaching and preserving blood albumen in a fluid state had a decided value for the meeting.

Pilocarpine has found its way into the dispensary, and hence its chemistry should not be unknown to the dispenser.

Mr. WILLMOTT's contribution was claimed to shed a new light upon the "germ theory" controversy.

It cannot be denied that from all these papers—an enviable list—the pharmacists present at Plymouth must have gathered much valuable knowledge, and if from the total number of contributions were deducted those not purely pharmaceutical, the residue would be such as would not entice a meeting together. Not only so, but the kind of information supplied by chemists and other scientific gentlemen to the Conference is such, that were it published elsewhere the Conference would sink in *status* and its members would have to seek the information in another place less easy of access; for all pharmacists who desire to keep pace with scientific progress must make themselves acquainted with all research concerning their business.

It is to be admitted as desirable that papers read at a Pharmaceutical Conference should as much as possible possess some sort of connection with pharmacy, and in that sense the observations of Professor ATTFIELD may serve as a useful hint to future intending contributors. But pharmacy is an art so largely dependent upon chemical science, that it is impossible to abstain from keeping pace with the development of that science, and it is equally impossible to say that the abstract science of to-day may not be, in some particular or other, the basis of the practical pharmacy of to-morrow.

At the same time it must not be forgotten that the contributors of the chemical and other papers are in no wise dependent upon the Conference, but *vice versâ*; the same papers, or the greater part of them, would be very acceptable at Burlington House at times, and if they had all been sent there in the past, the Conference would not hold to-day the position it boasts, with pride, to fill.

In our opinion, insufficient attention is paid to the scientific contributors at the Conference meetings, and we have long thought that some more formal vote of thanks should be passed to them than is done. For the sake of pleasing all, we would suggest that henceforth the authors of papers should summarize all facts of pharmaceutical interest in one final paragraph, so that if the papers be too scientific or too technical, a refuge and a home may be found for those who cannot or do not care to follow authors—sometimes prosy enough—through their writings *in extenso*. GIL BLAS got into trouble for reminding the Archbishop when his sermons fell off in eloquence and reasoning; the Conference should guard itself against committing the more unpardonable mistake of blaming authors for contributing requested papers which are too valuable.

SERIOUS ACCIDENT TO A PHARMACEUTICAL CHEMIST AT RICHMOND, SURREY.

Mr. HARRY LLOYD having undertaken to prepare an explosive mixture consisting of chlorate of potash, sulphur, and sulphuret of antimony, for use at the theatre, the compound spontaneously ignited with terrific effect. Mr. LLOYD lies at the Richmond Infirmary suffering intense agony from the severe burning of his face and hands; the eyes are closed and the features sadly distorted. It appears a mortar was used instead of mixing the ingredients upon a sheet of paper, the usual method.

PROPRIETARY MEDICINE LICENCES IN JAPAN.

IN a recently issued report on the Finances of Japan we are told that a new licence for druggists was imposed last January. It is described as not affecting the drugs and medicines used and prescribed by the medical profession, its object being to restrict the sale of medical compounds partaking of the character of quack medicines, in which, as well as in the charms against every description of disease and misfortune sold at every temple, the Japanese seems to have great confidence. To obtain permission to make and sell these medicines, a minute description in writing of the nature and effect of each must be sent to the ministry of the interior and heavy penalties are attached to their unauthorized sale and manufacture. A licence for the manufacture of one such medicine costs eight shillings per annum. A druggists' licence for their sale costs one shilling per medicine. Those of itinerant and other vendors cost one shilling for all sorts of these medicines. The latter licences are valid for five years.

AN Ordinary Meeting of the QUEKETT Microscopical Club will be held at University College, Gower Street, on Friday, September 28, at 8 o'clock, p.m.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

(*Continued from page* 218.)

The next paper read was entitled:—

Some Experiences in the Equipment and Working of a Small Pharmaceutical Laboratory.

BY G. F. SCHACHT.

The contrasts that exist between English and continental pharmacy have been a favourite topic with many of our travelled brethren; the lines of comparison have been many and various, and the conclusions arrived at have naturally not always commanded universal consent. But upon one point many of us have agreed in thinking that English pharmacists (taken as a body) were open to a charge that did not so generally lie against their continental neighbours, namely, that they bought too many and made too few of the preparations they consumed.

Critics of the severe order have sometimes followed this charge with the assertion that want of knowledge and want of skill are the true reasons for the phenomenon, and, on the other hand, the defence has not unfrequently been heard, that the question is solely one of economics, and that if premises and profit could but be put out of consideration, a very different order of things would prevail.

The defence, no doubt, sounds mean, and perhaps in an assembly like this ought scarcely to have been whispered; but my own experience (known only to myself) teaches me rather to sympathize with than to criticize the difficulties of those who, out of the workings of a small business, are trying, as a first duty, to pay twenty shillings in the pound; and consequently I am disposed to even applaud the defence.

Nevertheless I urge two points—1stly, an expenditure is not in every case an extravagance; and 2ndly, a very hopeful economy for pharmacists to practise is the economy of their overtaxed energies. And from these follows the deduction, that it cannot be otherwise than wise to sustain and refresh those energies by all available methods, and especially by such as will enable them in the fulfilment of daily duties, to labour with the best and therefore most profitable result.

Upon such a subject one must be careful not to dogmatize; nevertheless every man's experience ought to be of some value, and I therefore beg to offer such as I can give.

I long since came to the conclusion that it was best to make as many of the preparations we consumed as possible; and also that it was best to conduct operations of manufacture away from the interruptions of the shop. Several attempts to adapt one's premises to these ideas have been made at various times, and with certain measures of success; the latest I shall try and explain to you. Perfection is not for one moment thought to have been reached, still I find myself working with more satisfaction than hitherto. And here it is my duty and pleasure to remind you of a communication forwarded to the Journal, by Mr. Corder, of Norwich, and published in October of last year. It is thoroughly worth attention, and would perhaps have been of still greater practical value had fuller references been made to the cost of the several portions of apparatus there figured, the spaces they actually occupy in his laboratory, and the expense of some of the more frequent operations they assist to perform. But I feel personally grateful to Mr. Corder for his paper, and willingly acknowledge that, as far as this communication is concerned, I am following his lead.

The size of our firm's laboratory is 10½ feet by 13 feet, and it is 10 feet high. Its erection absorbed the last available bit of our back yard. We would gladly have extended its area a few feet had that been possible, but, space being peremptorily limited, our only course was to try and turn such as we had to the best account.

Light being fortunately obtainable from the roof, the whole of the wall space, with the exception of 2½ feet by 7 for the door, became available for fittings.

These four drawings, executed by the clever and willing hand of my pupil, Mr. John Tatham Thompson, represent the aspect of the four walls.

No. 1 represents the west wall, through which we enter by the door on the left. It is almost entirely occupied by a stove and drying closet. The former is 16 inches wide, 20 long, and 12 deep, and is enclosed by a portion of the square hood of zinc, the other part of which constitutes the drying-closet. The latter is divided by a diaphragm of zinc from the portion immediately over the stove, but the flue of the stove passes just within the diaphragm, and serves to keep the closet at a good drying temperature. It is supplied with four trays, each measuring 20 inches square. The flue inclines from the top of the hood to the main chimney in the corner; a large outer pipe accompanies it, and serves to convey to the chimney any steam or vapour that may be produced either in the stove chamber or the drying-closet, the heat produced by the flue, which passes through its centre, causing a good draught.

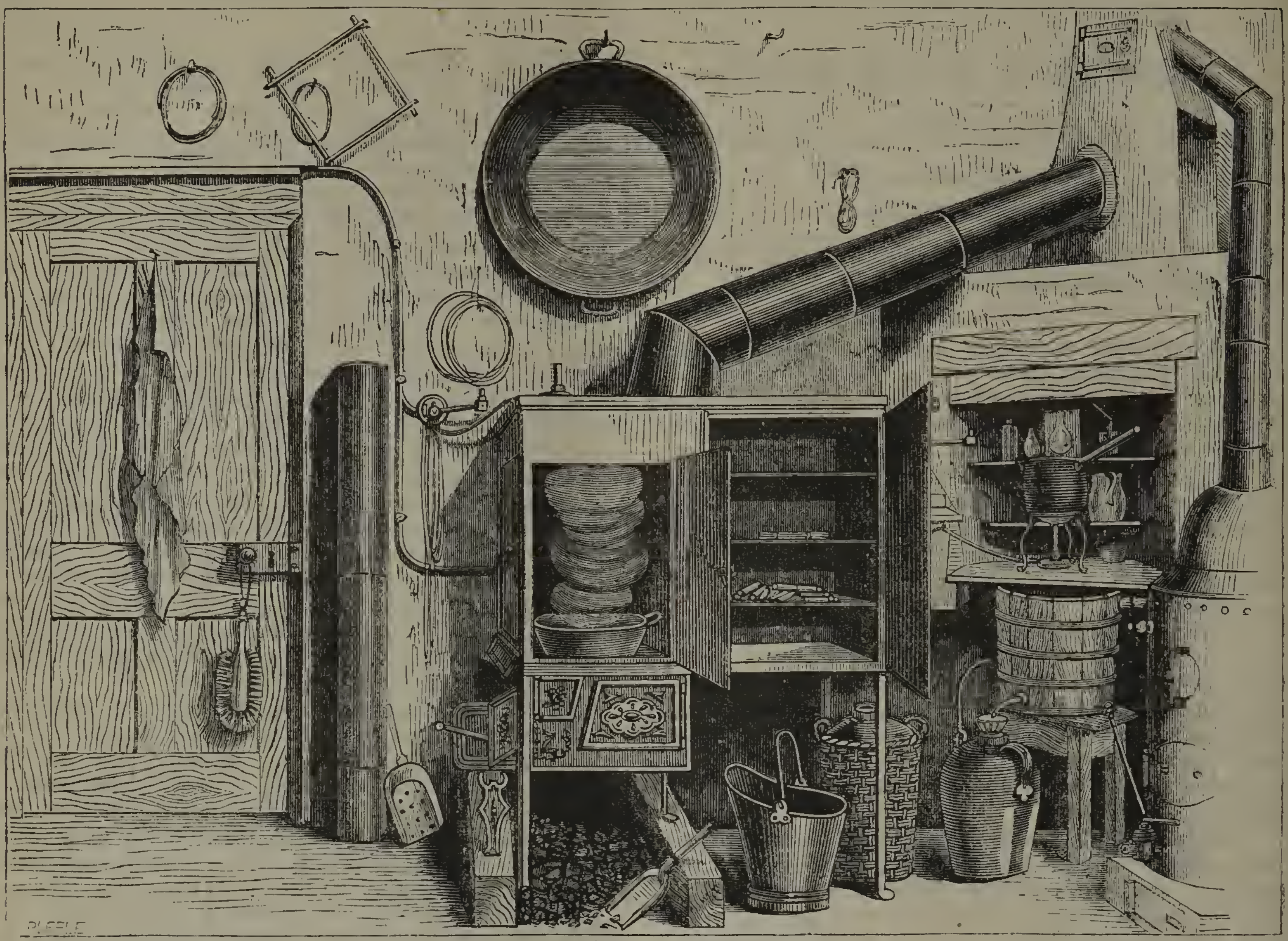
The large pipe at the side of the door is a ventilating shaft, and the space immediately under the stove is for fuel. A small desk for the laboratory book and the diary stands against the wall to the right of the closet.

In No. 2 (North Wall) we see the main chimney, beneath which and communicating with which is the fume-chamber. This, for the sake of getting a little greater depth, is placed diagonally to the two walls, and measures about 2½ feet in height and width, and is 1½ foot deep. Its floor and two shelves are of slate, and the walls are cemented. Beneath this is a worm-tub, diameter 16 inches, height 15 inches, for the condensation of superfluous steam. The boiler of iron is immediately to the right, its diameter is 15 inches, and its height 3½ feet. It holds about 8 gallons, and is filled by a pipe connected with the main. It is equipped with the usual appurtenances, fire-box, safety-valve, pressure-gauge, etc., and is supposed to be equal to a pressure of 100lbs. to the inch and more. The steam pipe passing off to the right is supplied with sundry cocks. When all these are closed, and the fire duly burning, the pressure within of course accumulates. If the cock at the back be opened, the steam escapes through the worm-tub already mentioned, and is condensed into distilled water. If that furthest from the boiler be opened, the steam passes into the jacketed apparatus which stands next. This consists of an enamelled iron pan or basin of 10 gallons' capacity, jacketed with iron, all of sufficient strength to withstand an internal pressure of 30lbs. or 40lbs. to the inch. Its outside measurement, exclusive of a 3-inch rim, is diameter 22 inches, depth 22½, and it is held in its required position by an iron tripod. The jacket is provided with a safety valve that blows off at about 20lbs. pressure, and at the bottom a pipe and stopcock communicates through the jacket to the pan, through which the contents may be drawn off.

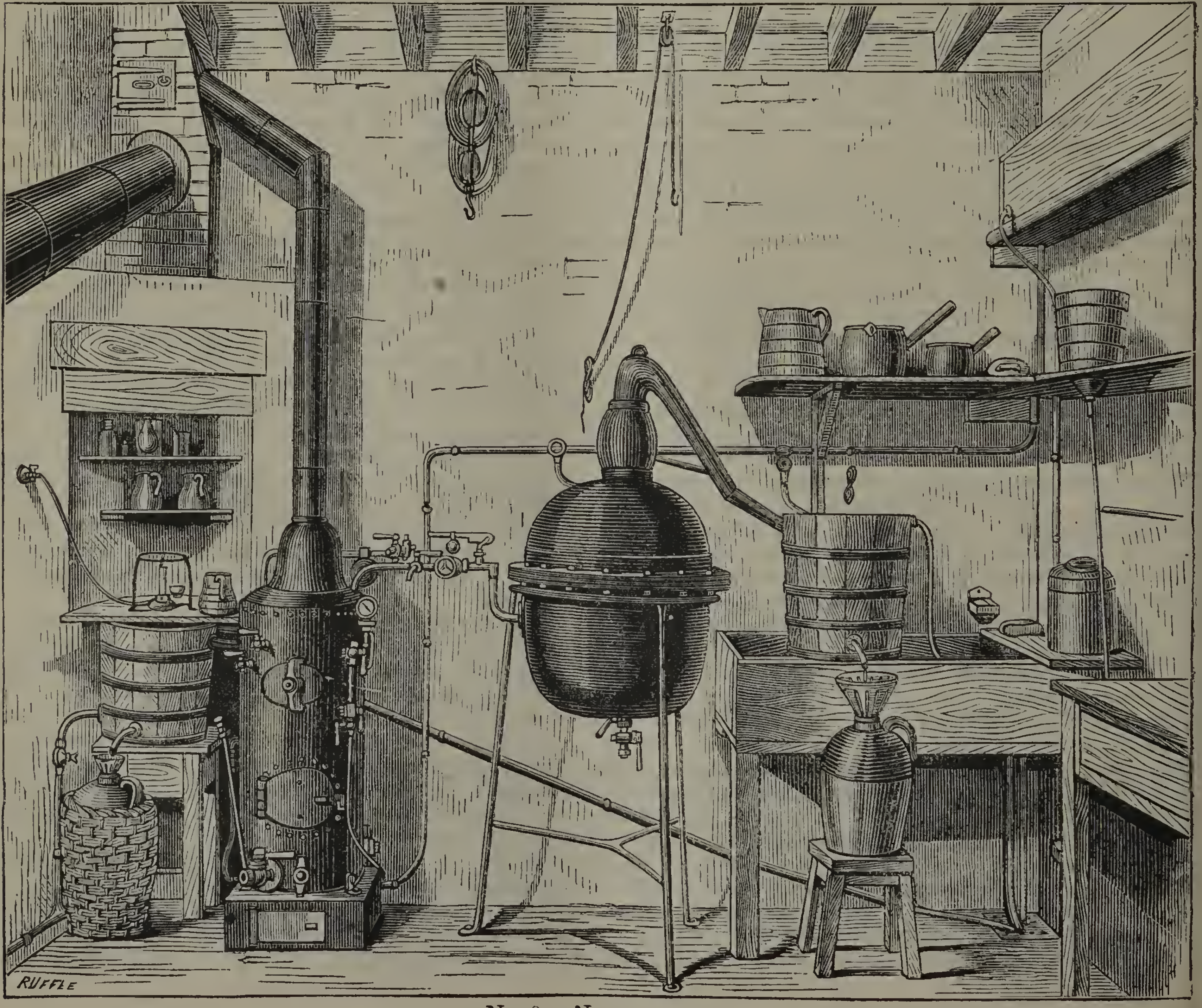
This pan or basin is converted into a still by lowering upon its rim the head and securing the joint with a little luting; the swan-necked extremity of the head passes into a condenser temporarily placed over the sink; the arrangement is convenient for the recovery of spirit, etc.

It will be noticed that the steam pipe is further provided with two cocks opening to the front. From these by means of good elastic tubing steam of moderate pressure can be conveyed to any separate piece of apparatus as we shall presently see.

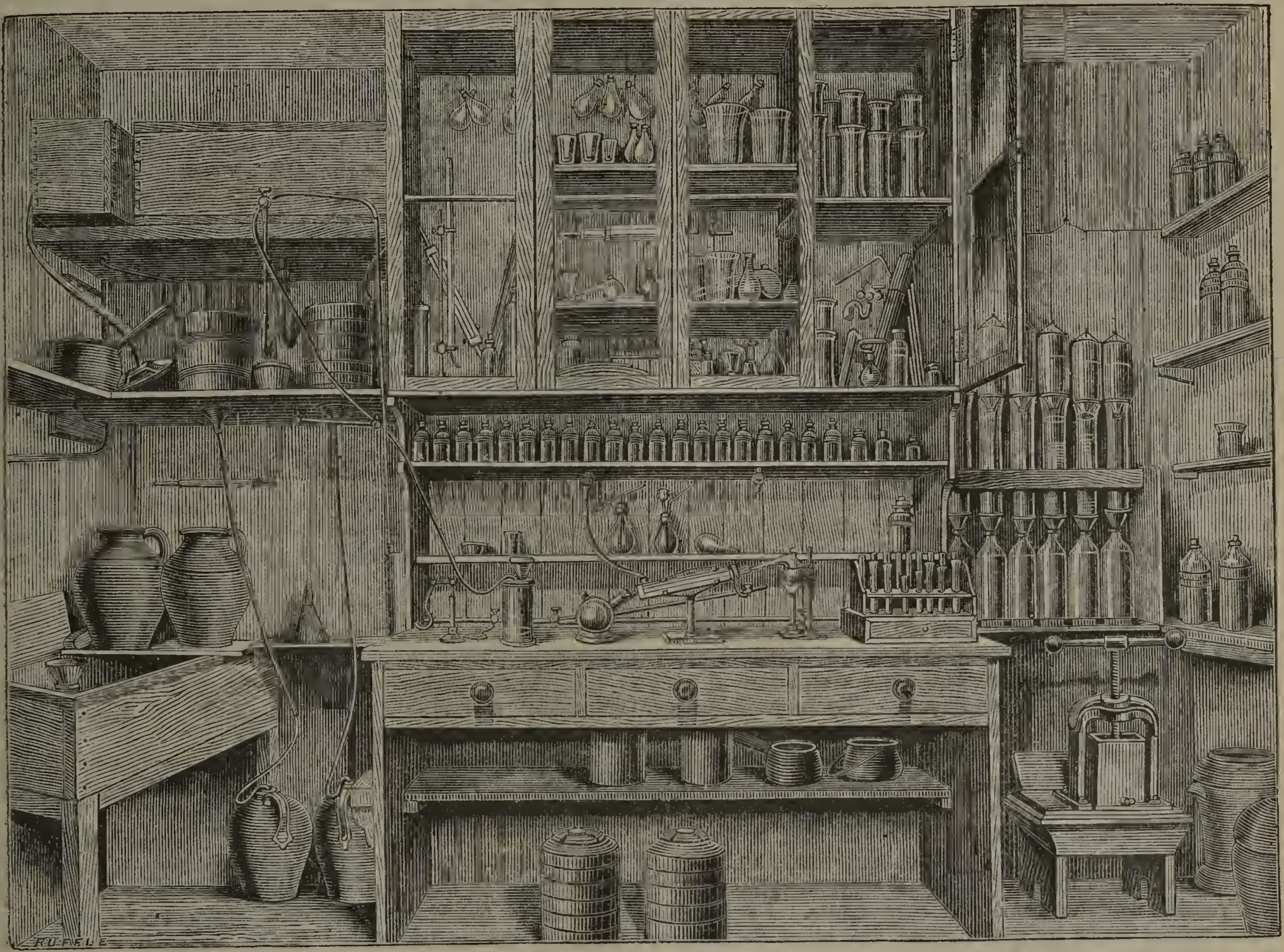
On the extreme right is a sink, 3 feet 6 inches by 2 feet. The water is introduced to the laboratory near the floor upon the west wall, and passes along the north wall over the sink to a small reservoir near the top of the east wall, and the pipe is supplied with taps at convenient spots.



No. 1.—North-west Wall.



No. 2.—North Wall.



No. 3.—East Wall.

No. 4.—South Wall.

No. 3 is the east side, and is mainly occupied with a deal counter, some drawers and shelves enclosed in glass. A gas-pipe with two taps runs along the back edge of the counter, and a water-pipe, also with two taps, from the reservoir is conveyed along the front of the second shelf. Further, a waste-pipe, also provided with two taps, passes along the wall and inclines downwards as it approaches the sink on the left. A Liebig condenser or any similar piece of apparatus can thus be kept in continous and cleanly operation.

By the side of the rack of shelves on the left is placed one of Mr. Fletcher's arrangements for producing an air-blast for blow-pipe—it can also be applied as an aspirator. Still further to the left, and in part over the sink, are placed two of my own filters, holding two gallons each, for which we have very nearly constant employment.

On the right of the shelves is a rack for six displacement-tubes with their accompanying receivers and reservoirs, and beneath them is a small press.

Along the south wall, No. 4, runs a counter and a series of shelves, they are fitted for purposes somewhat special, perhaps, to our own particular business, and might be replaced by anything thought to be more required.

Amongst the appliances here stowed away till required is the one employed in the preparation of distilled medicated waters. For this the two spare steam-taps already mentioned have to be employed. The ingredients are placed upon a colander within the small still, the body of which is immersed into a vessel that acts as a jacket to it. Steam is now introduced into this jacket, and when the whole is well heated to boiling point the other tap is turned and steam is passed into the still below the colander. It there traverses the ingredients and passes out for condensation in the usual way, carrying with it the volatile constituents of the ingredients. I think distilled waters made by this method are more delicate in flavour than if prepared by any other plan. The size of this apparatus is only that of a large saucepan, but it is sufficient for the preparation of one gallon of cinnamon or other pharmacopœial water.

One piece of apparatus more finds room in this large laboratory—it is a grinding-mill. The wall space being all absorbed, a stout stand was made for it, and when not in use for holding this mill it is covered with a top and converted into a table. It stands in the centre of the laboratory.

The large stone and iron mortars are in an adjoining wareroom, and are brought in when required.

I may further state that the floor of the laboratory is of Portland cement, the walls of brick faced with cement, and the roof is of open rafters boarded and covered with zinc. The roof contains a fanlight 4 feet square, capable of being opened at both sides for ventilation.

Now with regard to the cost. I find the building cost £48; the carpenters', plumbers', and gasfitters' work for the internal fitting amounted to £37; the boiler cost £20; the jacketed pan-head and worm-tub, £19; the worm-tub under the fume chamber, £4; the stove and drying closet, £8; the mill, 50*s*; the apparatus for distilling medicated waters, £2 17*s*.; the blow-pipe and accessories, £1; sundry fittings, £7; making a total of £150.

The expense of working is very small. I burn nothing but coke in either the boiler or the stove, and I can keep them both going for a whole day with a consumption of less than a half hundredweight of coke, which in my neighbourhood means about 5*d*. worth of fuel.

Thus at a cost for fire of 3*d*. I can supply 16 gallons of distilled water, or supposing other wants to be more urgent, I can for the same amount draw, say, 1 gallon of cinnamon water, 1 gallon of dill water, make a batch of 50 lbs of syrup, and still have 3 or 4 gallons of distilled water as a by-product.

To the many other purposes to which these appliances can be turned I cannot now refer, but I am sure they offer opportunities for doing many things with great convenience and as well as the intelligence of the operator chooses.

I hope all who see and hear this communication will be good enough to remember that it is addressed only to the average pharmacist. The "traditional houses" have long since supplied themselves with all that is good, and have not allowed the thought of cost to enter into the question. They are far past the necessity of any hint from me. But every house now "traditional" had its beginning, and my chief purpose is to show at how little risk this early step in progress may be made.

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The PRESIDENT, in thanking Mr. Schacht for his paper, said the fitting up of a laboratory was something like ventilating a room, the means must be adapted to the circumstances of the case. Mr. Schacht had to put up his building first, but very often those who had to fit up a laboratory had a building ready to hand which they had to utilize in the best way they could. His own opinion was that it was not desirable to attempt too much the *multum in parvo*, but rather to confine one's self to a few simple pieces of apparatus, unless there was abundance of space.

A vote of thanks was passed to Mr. Schacht and to Mr. Thompson, who had so beautifully illustrated the paper.

Dr. ROWE (Redruth) agreed with the remarks of the President, and expressed the satisfaction he had received at listening to Mr. Schacht's paper.

Mr. MOORE asked if the purity of the water distilled in the simple apparatus described by Mr. Schacht was sufficient for all practical purposes.

Mr. GREENISH said it had been his privilege to see laboratories in many parts of Germany, Austria, St. Petersburg, and Moscow; in fact, a laboratory was almost universally found in those countries even in establishments of the smallest size. It was formerly required by law in Germany that every pharmacist should have a laboratory; latterly this rule had been relaxed, but the pharmacist was still held responsible for each article he sent out, just as if he had made it himself. With regard to apparatus, his own was very similar to that described by Mr. Schacht. He thought, however, there was the disadvantage in a drying cupboard, such as Mr. Schacht described, that if the stove or fire was not always in operation the drying process went on irregularly. Distilled water was always a difficulty with pharmacists, and he never could get any kind of apparatus which would give him the quantity he required until he made an arrangement in connection with his kitchen boiler, by means of which he now had more than he could use. He had a close range in the kitchen with a wrought iron boiler from which a 1½-inch pipe passed upwards and on to the chimney piece, where it was divided into two ¾ inch iron pipes; one passed into the area and had a valve upon it, and the other into the laboratory where it terminated in a large coil of block tin, placed in a tank of galvanized iron to form a condenser. He had had this in use for some time, and it answered admirably.

Professor ATTFIELD said there was a sectional sketch of a distilling apparatus connected with the kitchen boiler in the 'Year-Book' for 1871, page 604, in illustration of a paper by Mr. Staples. Mr. Bottle stated at the meeting at which that paper was read, that the plan was an old one, and that he had had a similar apparatus in use for twenty-five years.

Mr. CHIPPERFIELD remarked that such an arrangement was not compatible with a continuous supply of hot water to a bath, such as he had attached to his kitchen boiler.

Mr. GREENISH said in such case it would be necessary to have two boilers.

Mr. CHIPPERFIELD added that a very good drying closet could be made by passing the hot water pipe supplying the bath through a cupboard, forming the pipe into a coil at the bottom before it passed up to the bath.

Mr. SIEBOLD remarked that German pharmacists had in course of time found that it was by no means wise to make a great number of preparations on their own premises, and that in many instances it was better to purchase them from wholesale houses who made them on a large scale. When he was an assistant in German pharmacies he made many preparations which he was sure were not made there now, because it was much more expensive than buying them ready made. Laboratories were still found, but the number of preparations made was comparatively small, being chiefly confined to those articles the purity of which it was difficult to ascertain by testing, such, for instance, as the extracts, tinctures, and other preparations of a purely pharmaceutical nature. With regard to chemicals the existence of the smallest percentage of impurity could be readily detected and there was therefore no inducement to make them.

Dr. SYMES thought that as a matter of economy no pharmacist would ever attempt to make all his own preparations, because where these things were made on a large scale it paid persons of skill and experience to devote their whole attention to the operation, and thus better results were insured than could be obtained in a small laboratory with divided attention. There was, however, another side to the question. He had noted for many years the want of original research amongst English pharmacists, and the complaints made by the editors of the Journal that they had to go to a foreign source in order to present their readers with those interesting practical papers which all read with so much pleasure. So long as pharmacists confined their attention to examining the things they bought (which would often take almost as long as making them), they would never get a variety of experience brought to bear on the manufacture of many preparations, and this was what was required in order to effect any improvement. One man would try one thing, and another another, and though the results might appear contradictory, if they were all willing to learn the experiments would lead to improvements which would perhaps never be made if they looked at the matter merely from a pecuniary point of view.

Dr. PAUL described a form of still which he considered superior to that shown by Mr. Schacht inasmuch as the head could be fixed without luting. The body and cover were provided with accurately turned flanges, and by means of screw bolts a perfect joint could be made. At the bottom, in place of a cock which was always getting out of order, he had a conical hole fitted with a plug, on raising which the contents escaped. He also described and sketched a horizontal mill which was self-cleansing, the material ground in it falling down by the action of gravitation.

Mr. GROVES said that he employed an iron boiler with iron pipes for distilling water, but he found the result unsatisfactory, because some of the steam got condensed in the iron pipe and carried down impurities, but he got over that difficulty by passing the steam into a tin vessel something like a Wolff's bottle before it was admitted to the condenser. Still he found a large quantity of ammonia in his distilled water which was probably owing to the water used containing nitrates which were reduced by the iron of the boiler.

Professor ATTFIELD drew the attention of the Conference in connection with this subject to the patent process of Professor Barff for coating iron with black oxide, which so marvellously resisted the action of many substances that affected ordinary iron. He was quite sure this new material would come largely into use in pharmacy as it would in many industries, and he hoped before the next Conference some gentleman would be able to give the Conference some practical information on the subject.

Mr. COLES (Chippenham) said that if a small laboratory was not always a financial success it must give opportunities for research which no mere testing of chemicals would do, and would be of immense advantage to young men learning the business.

Mr. GREENISH said there was a very excellent American mill now imported into this country at a very moderate price, which was specially useful where percolation was employed to any extent.

Mr. SCHACHT said he had derived much satisfaction and instruction from the discussion which had taken place, and had very little to add by way of reply. He used gas sometimes, but generally coke because it was cheaper. His distilled water was perfectly pure, and though he would not say there was never any trace of ammonia he did not think it existed to any extent. The boiler was of iron, the pipes leading from it were of lead, and it was necessary in putting up a new apparatus to work it for some time before using the product in order to get rid of the oily matters used in fastening the joints. Dr. Paul's suggestions were very valuable, but it struck him that his arrangement for fitting the still head would be more applicable to a small than to a larger one; the difficulty would increase in proportion as the size increased. There was no question that Dr. Paul's mill was superior to his own, but he had found on inquiry that it would be more than six times as expensive. In conclusion he should be happy to show his laboratory to any one who happened to be in his neighbourhood.

Mr. UMNEY thought lead pipes very objectionable where either steam or condensed steam (pure water) was passing through them.

The next paper was a—

NOTE ON DIPHENYLAMINE AS A TEST FOR NITRIC AND NITROUS ACIDS.

BY N. H. MARTIN.

Attention having recently been called to diphenylamine as a test for nitric and nitrous acids, it has appeared to me the subject might not unworthily occupy the time of the Conference for a few minutes. The tests for nitric and nitrous acids, both free and in combination, at present in general use, are just so far unsatisfactory as to render welcome the addition of any reagent to the resources of the analyst, the more so when the proposed reagent is one easily applied and of considerable delicacy. This substance, in common with so many other aniline derivatives, has ceased to be a mere chemical curiosity, and being manufactured on a commercial scale there is nothing to prevent its finding its way into general laboratory use.

Diphenylamine, $C_{12}H_{11}N$ equals $NH(C_6H_5)_2$, is a "base produced by the action of various phenol compounds on aniline, the reaction consisting in the substitution of phenyl (C_6H_5) derived from the phenolic ether (C_6H_5OH) for an atom of hydrogen in the aniline ($N(C_6H_5)H_2$) molecule." This may be done in various ways—for instance, by heating aniline hydrochloride with phenol and fuming hydrochloric acid; but it may be that none of the published processes is that actually followed when manufactured on a commercial scale. Several of the aniline compounds have delicate reactions with various acids, but I only find that one of them has been used as a test for nitric acid, and that is the sulphate. A note on this subject will be found at page 164 of the 'Year-Book,' for 1870, but the author from whom it is quoted is not mentioned. The fact is simply recorded that sulphate of aniline is stated to be a "surprisingly delicate test for nitric acid." In a paper "On the Estimation of Nitrous and Nitric Acid," read before the Newcastle-on-Tyne Chemical Society, by its late President, Dr. Lunge (now at Zurich), and copied from the proceedings of that society into the *Pharmaceutical Journal* of last week, it is stated that diphenylamine "is the most delicate of all reagents for ascertaining the freedom of sulphuric acid from nitrogen compounds." Dr. Lunge's remark has lead me to try several experiments upon a number of samples of so-called pure sulphuric acid, and of these one only failed to give distinct indication of the presence of nitrogen compounds in greater or less quantity. I do not propose to enter upon the theory of the reaction or to occupy your time further than is necessary to explain and show the application of the test.

The method of using the test is as follows :—Take a small quantity (about the size of a mustard seed will do) of the diphenylamine, put it into a test tube and pour a little sulphuric acid over it, then add a drop or two of water so as to increase the temperature sufficiently to effect the solution of the diphenylamine, and the test is ready for use. Now add very gently the solution to be tested, and if only a trace of nitric or nitrous acid be present a beautiful and very permanent blue coloration is produced at the junction of the two liquids; but if there be any quantity of the nitrogen compound the colour becomes almost black. This reaction is so delicate and certain that in the case of a solution of nitric acid containing about one part B.P. acid in 10,000 of water the reaction is most distinct. One part of nitrite of potassium in 30,000 of water gives also most unmistakable evidence of the presence of the nitrogen acid.

The value of this test seems to me to consist in its being so readily used and in its indications being so quick and well defined. I have spoken only of diphenylamine being used as a qualitative test, but it will also make a very fair quantitative test, by comparing the coloration produced respectively by a given quantity of the acid to be tested and a given quantity of acid containing a known quantity of nitrous acid, with an excess of the reagent.

I have not been able to make out to whom we owe the first suggestion of the utilization of this reaction, but I take the chance of its being as new to many of the Conference as it was to myself.

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A vote of thanks was passed to Mr. Martin for his paper.

Mr. ALLEN said he understood that Mr. Martin proposed to compare the colour with that furnished by a known quantity of nitrous acid. If the process answered for nitrates as well as nitrites, would it not be more convenient to use nitre in solution?

Mr. MARTIN said the process would certainly answer as well for nitrates as for nitrites.

The next paper read was entitled—

THE PILL MASSES OF THE B.P., WHICH ARE OF AN INCONVENIENT CONSISTENCE, OR ACQUIRE THAT CONDITION BY KEEPING.

BY JOHN C. THRESH.

This paper is an answer to query No. 36 in the list of subjects for research issued by the British Pharmaceutical Conference in May, 1877.

Of the twenty official pill masses the seven following have or acquire by keeping a consistence unsuitable for dispensing :—

Pil. Aloes et Assafœtidæ.
" Aloes et Ferri.
" Aloes et Myrrhæ.
" Cambogiæ Co.
" Coloc. Co.
" Ferri Carbonatis.
" Phosphori.

Of these the pil. aloes et assaf. is too soft, simply because too large a quantity of excipient is ordered. Increase the soap to $1\frac{1}{2}$ ozs., and take $\frac{1}{2}$ oz. conserve instead of 1 oz., and a good mass is formed corresponding to the B.P. form in strength. Pil. phosph., though perhaps in some respects objectionable, appears to be as good a form as has yet been proposed, and as I doubt whether I can improve it, it must needs be passed over. The other five masses all become hard by keeping, and it appeared likely that some excipients might be found adapted to all. The combination of glycerine and tragacanth is probably the best excipient for the purpose, but no single form for this mucilage is suitable for all the five masses. The pill of carbonate of iron, and the pill of aloes and iron, must be made with tragacanth and glycerine only, and not by Mr. Proctor's form (which contains water), as with the latter excipient they soon become hard. The following forms answer admirably, and the pills thus made will keep for a considerable length of time almost unchanged.

Pil. Aloes et Ferri.

Aloes Bbd. in powder	2 ozs.
Sulphate of Iron	$1\frac{1}{2}$ oz.
Comp. Pd. Cinnamon	3 ozs.
Powd. Tragacanth	1 dr.
Glycerine	1 fl. oz. Mix.

Aloes 1 in 4 nearly. Iron 1 in 5.

Pil. Ferri Carb.

Saccharated Carbonate of Iron .	$6\frac{1}{2}$ ozs.
Powd. Tragacanth	$1\frac{1}{2}$ dr.
Glycerine	$1\frac{1}{4}$ fl. oz. Mix.

The three remaining pills are best made with Mr. Proctor's excipient.

Tragacanth powder	3 drs.
Glycerine	9 fl. drs.
Water	4 fl. drs.

Mix the gum and glycerine till smooth before adding the water.

The specimens sent have been made nearly a year, are in excellent condition, and so far as I can tell as active as the freshly prepared masses. As pills made with this excipient are with difficulty disintegrated by action of water, it has been asked whether they are as active as those made with the B.P. excipients. To satisfy myself upon this point I have had administered purgative pills of both kinds, and I have failed to detect any appreciable difference in their action upon the bowels. (I could not say, however, that pills of opium, morphia, etc., act as speedily when made with tragacanth.)

For pil. coloc. co., use 1 oz. of mucilage instead of the water. In pil. cambogiæ co., 1 part of excipient may replace the syrup. Pil. aloes et myrrhæ requires a rather larger proportion of excipient, otherwise it becomes very tough. A good form is

Powd. Soc. Aloes	2 ozs.
" Myrrh	1 oz.
" Saffron	$\frac{1}{2}$ oz.
Glyc. Tragacanth	1 oz.

If it should be deemed necessary to make the form correspond in strength to the B.P. pill, $1\frac{1}{4}$ ozs. of some simple powder, as pulv. cinnam. co. might be added, and the $1\frac{1}{4}$ oz. of excipient would then reduce it to the desired strength.

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The PRESIDENT said it was very desirable to ascertain the best method of producing these pill masses so as to keep for a reasonable time without becoming unduly hard.

Mr. GREENISH said Mr. Thresh appeared to have generally used the excipient introduced by Dr. Symes, tragacanth and glycerine, only he had first put in the tragacanth and added the glycerine afterwards to the mass. Mr. Thresh seemed to think that a pill which became hard from the introduction of tragacanth might perhaps not be readily soluble in the stomach, but when examining tragacanth for the cell tissue and starch in it he (Mr. Greenish) had been astonished to find how the hardest piece dissolved by the addition of the smallest quantity of moisture, more readily probably than any other gum.

Dr. SYMES, though he had used tragacanth and glycerine for some years for pill masses, could not claim any originality in the matter. He must take exception to the remark that the pil. phosphori of the B.P. was the best form that could be used, for he considered it one of the worst. He had heard from medical men and read that this pill passed through the system without being disintegrated.

The PRESIDENT said though he agreed with Dr. Symes' remark as to pil. phosphori if used in the form given in the Pharmacopœia, he could not in any other sense do so at all. On the contrary, he considered that form to be unobjectionable and in many respects an excellent one. He had stated over and over again that the pil. phosphori was not intended to be administered in the form in which it stood, but should be mixed with soap. The reason why soap was not introduced into the formula was that if the pill mass contained soap it could not be kept immersed in water, whereas in its present form the phosphorus might be kept ready for use for an unlimited time unoxidized. It was intended to be kept beneath the surface of the water and might be so kept for any length of time. Mr. Ekin had suggested that the balsam of tolu might be replaced by hydrated resin, which also might be incorporated with the phosphorus under the surface of water. The form given in the Pharmacopœia originated with Mr. Abraham, of Liverpool, and the balsam of tolu was selected because its specific gravity enabled it to be kept in a melted state in hot water, and the phosphorus could then be completely incorporated with it without any exposure to the air or any chance of oxidation.

Dr. SYMES thought it was a great misfortune that medical men had not been officially informed how this pill should be administered. He grounded his remarks on what he had heard and on letters which appeared constantly in the medical papers, pointing out that the pil. phosphori would occur in the fæces entirely unaltered.

The PRESIDENT said it would be no doubt an advantage if an addition were made to the formula, saying that soap should be mixed with the pill mass when administered.

Mr. GERRARD said he had had considerable experience in the making of phosphorus pills, and although he was the author of the suggestion that phosphorus was soluble in resin he now thought the best way was to use that solvent *par excellence* bisulphide of carbon. The great difficulty in every case was to prevent oxidation, but he had recently adopted the following method to meet this difficulty: Immediately the least trace of oxidation was perceived after the evaporation of the bisulphide of carbon, he added a little chloroform, which being a heavy vapour prevented contact with the oxygen of the air. While the materials forming the pill were surrounded by chloroform, water could be added and the pill mixed up with the loss of hardly any phosphorus by oxidation.

Thanks were voted to Mr. Thresh for his paper.

The next paper read was—

SOME FURTHER EXPERIMENTS UPON THE ALOINS.

BY WILLIAM A. TILDEN, D.SC. LOND.

When nataloin is digested with a ten per cent. solution of bichromate of potassium, acidified with the proper quantity of sulphuric acid, brisk effervescence occurs owing to the escape of carbonic acid gas; but an examination of the liquid led to the discovery of nothing else except acetic acid. In a former paper I pointed out that when nataloin is treated with nitric acid it yields carbonic and oxalic acids and a small quantity of picric acid. I have little doubt, therefore, that when chromic acid is the oxidizing agent employed, a small quantity of some benzene derivative, probably quinone, is formed, but in quantity too small to allow of its ready detection.

Barbaloin and socaloin, as I have already shown in a paper communicated to the Conference, have the same composition, and both yield chrysammic acid as the characteristic product of the prolonged action of nitric acid. When oxidized by bichromate solution they both behave in precisely the same way, yielding carbonic acid, a little acetic acid, and a yellow compound which, as it has proved rather interesting, I propose to describe.

Whether obtained from barbaloin or socaloin, or even by the oxidation of Zanzibar aloes, this compound has the same properties and composition. In allusion to its yellow colour, I call it "Aloxanthin." It is almost insoluble in acidulated water, but slightly soluble in the ordinary solvents, and is crystallizable with great difficulty.

After purification by repeated deposition from alcohol, acetic ether, or glacial acetic acid, it was analysed, and gave numbers agreeing with the requirements of the formula $C_{15}H_{10}O_6$. When heated with zinc dust this substance is reduced to a hydrocarbon, which turned out to be methylanthracene. The formula $C_{15}H_{10}O_6$ may therefore be written $C_{14}H_3(CH_3)(OH)_4O_2$, which represents a methyltetroxyanthraquinone. It is interesting to observe that this formula belongs to a third term in the series to which also belong chrysophanic acid and emodin, two yellow substances existing ready formed in rhubarb root and in the roots of various other plants allied to rhubarb. The relation between these compounds is manifest on comparing their formulæ, according to which they appear as di-, tri-, and tetroxyderivatives of methylanthraquinone.

Chrysophanic Acid.

$$C_{15}H_{10}O_4 = C_{14}H_5 \begin{cases} CH_3 \\ (OH)_2 \\ O_2 \end{cases}$$

Emodin.

$$C_{15}H_{10}O_5 = C_{14}H_4 \begin{cases} CH_3 \\ (OH)_3 \\ O_2 \end{cases}$$

Aloxanthin.

$$C_{15}H_{10}O_6 = C_{14}H_3 \begin{cases} CH_3 \\ (OH)_4 \\ O_2 \end{cases}$$

Aloxanthin agrees with chrysophanic acid and with emodin in yielding a cherry red solution in alkalies. It may be sublimed, though the greater part is charred and destroyed in the operation. When treated with cold strong nitric acid it yields a yellow nitro-compound which has all the characters of the aloetic acid described originally by Schunck in 1841, and which is formed together with chrysammic acid by the action of nitric acid upon aloes. Aloxanthin is also converted into chrysammic acid by boiling for some time with nitric acid.

A vote of thanks was passed to Dr. Tilden.

The PRESIDENT said the next paper was by Mr. Atkins, which would be read, but no discussion would take place upon it, as agreed yesterday.

Mr. GUYER (Torquay) asked if this was to be made a precedent. If so he should protest against its being read at all.

The PRESIDENT thought the decision deliberately come to on the previous day without any opposition could hardly be disturbed then.

The following paper was then read by Mr. Atkins, and the thanks of the Conference were voted to him.

A POINT IN PHARMACEUTICAL ETHICS.

BY S. R. ATKINS.

The advantages of such annual gatherings as the present one are manifold, not simply to post the day-book into 'The Year-Book of Pharmacy' and scientific research —registering the achievements of the past, possibly initiating new ones, but also enabling us more calmly and judicially to examine and review our ethical relations, home and foreign.

I have thought that it might be expedient at this Conference to refer to one of those questions now engaging the attention of pharmacists throughout the country, viz., their relation to the medical profession.

Confessedly we are in a state of transition; the old is giving place to the new. In this respect we are only sharing the experience of society generally; but from a variety of causes which a careful analysis enables us approximately to estimate, we, the pharmacists of to-day, are more especially influenced.

It is as difficult for us who are engaged in the strife and controversy of opinion to calculate the exact momentum and direction of the forces so employed, as it is for the individual soldier to discern which way victory leans, when the field is wide, and the combatants are numerous. We have, however, amongst us men of experience and capacity—men tried and true—whose lead we may safely follow; and, at least, let us who may belong to the rank and file evince a discipline and obedience worthy of our position.

But to come to the point. What are the true relations between pharmacy and the medical profession?

It is evident those relations at the present moment are not in a healthy condition. The extreme behaviour of the extreme section of either party has imperilled that respect and confidence which ought to exist between them. That such feelings are restricted to the extreme right and left is probably true; that the vast majority of medical men and chemists are innocent of such mutual antagonism is equally true; that the amount of noise such controversies make is frequently in the inverse ratio to their social and professional importance is equally certain. Still the bare existence of such schools of thought is a scandal, and their practical evolution before stipendiaries, and ultimately in courts of appeal, renders it imperative on all moderate and law-obeying subjects to seek to bring about a better understanding.

In this suit, pharmacists are the defendants. If Turks have fought bravely behind their own fortresses, so ought we; our position is impregnable.

We stand charged with counter-prescribing—so runs the indictment. To a certain extent we admit the charge and plead justification. That there are chemists who are in the habit of encroaching on the function of the medical men, we do not deny; such men never have been and never will be defended by the Council of the Pharmaceutical Society of Great Britain. As every flock is said to contain its black sheep, and every large family its odd member, so are the men of whom we speak, the exception and not the rule.

With such practices we have nothing to do. What, however, we are careful to defend, as our just and inalienable right, is that simple and moderate counter practice which has grown up without legal enactment, and, as we believe, contrary to none; but which is so embedded, not simply in the habits, but the very necessities of the people, that a blue book of prohibitions could no more extinguish it then an Act of Parliament could convert every Englishman into a Scotchman, however desirable in the abstract such a conversion might be.

We contend for a custom of long standing, as we find it in the vast majority of respectable well-conducted druggists' shops, the practice of prescribing across the counter for simple ailments. And altogether apart from personal and pecuniary considerations, we contend for this custom in the interests of the public. This is the only line of defence worth maintaining, and it is the one which parliament and our courts of law, our legislative and executive authorities, will ever respect.

If it be asked where the line of demarcation should be drawn, we reply, that it is impossible to draw one, but an honourable man will seek to avoid the very appearance of evil, and if parole, the law of honour, fails, no inquisitorial acts of a medical police will ever succeed.

We assert that the custom we are considering has grown out of public necessity, and not from proffered service on our part. We have not sought but been sought. And this, partly the result of higher education and more efficient training; knowledge winning reputation, confidence, and patronage, an order of natural induction. *Noblesse oblige;* the very position knowledge has thus secured will make its possessor all the more careful not to traverse forbidden lines.

What counsel then may we venture to proffer our brother pharmacists, and also, if it be not deemed impertinent, to professional men, so far as this discussion may reach them. We suggest that there is room for mutual courtesy and forbearance, the avoiding of tall-talk and bluster. We have, by a combination of firmness and conciliation, to convince the public and the profession that all we desire is fair play. In order that we may accomplish this, we must be prepared to invite the most thorough inquiry; there must be no back-parlour consultations, no minor acts of surgery, no semi-professional visits, in short nothing in excess of that ordinary counter practice the meaning of which we all recognize, however difficult the exact definition of the same may be.

Such rights must be defended with the united strength of the entire body of chemists throughout the kingdom. Time is assuredly on our side. Should a hasty decision adverse to our claims be snatched on *ex parte* evidence, or even on the legal interpretation of a statute that ought long since to have been swept away, such an event will prove no permanent disaster, but only hasten the conclusion we desire. One really good case, well argued before an intelligent jury must secure a verdict in our favour and definitely settle the question.

Such an arbitrament ought, however, not to be necessary; the House of Commons should anticipate any action of this sort by defining what are our privileges.

The day assuredly will come, when medical men and pharmacists will no longer regard each other as competitors but as fellow-workers, both engaged in the treatment of disease, the one in the preparation the other in the administration of remedies. Nor will the wise physician regard with jealous eye the growing culture of the pharmacist, for through it he works with greater accuracy and success.

We each may have something to surrender, if so, let the concession be mutual, gradual and complete.

At least let hostilities cease whilst the conditions of an honourable peace are being negotiated.

The next paper was read by Mr. Kingzett—

Presence of Metallic Compounds in Alimentary Substances.

BY B. H. PAUL, PH.D., F.C.S., AND C. T. KINGZETT, F.C.S.

1. *Introduction.*—Under the Sale of Food and Drugs Act a number of prosecutions have been instituted during the last few years, having regard to the presence of metallic compounds in articles of food. Meanwhile, the knowledge possessed by either chemists or medical men as to the behaviour of such compounds upon the human system is extremely meagre. There can be no doubt that many mineral substances exercise a prejudicial influence upon health, but the measure and nature of this influence is in most cases an undetermined quantity, while it is probable that owing to popular prejudices a number of harmless substances (considering the quantity taken into the system) are assumed to possess pernicious or poisonous properties.

2. *Preserved Peas and Copper.*—One of the most popular of foods, and one which has been most severely remarked upon, is preserved peas. This article of food is prepared for the most part in France, and in connection with it a very considerable trade has developed. The Paris merchants aver that the peas will not maintain their bright green colour unless a small amount of sulphate of copper be added to them, in which case they keep their colour admirably. The quantity thus added varies between one and two grains of the ordinary blue sulphate to the tin of peas, containing from $9\frac{1}{2}$ to $9\frac{3}{4}$ ounces of peas* and 150 c.c.

* Weighed after separation and draining from liquor as taken from the tins.

of liquor. The question of what influence this copper has upon health is one which has been hotly discussed and widely differing opinions have been expressed by medical men. Ordinarily, however, it has been assumed that the copper is injurious to health, and vendors of preserved peas have often been fined in consequence. This difference of opinions is readily explained by the imperfect acquaintance of those who expressed them with the scientific facts.

It appeared to us that in order to arrive at a proper knowledge of the physiological influence of the copper contained in preserved peas, it was desirable to determine the following points:—

(1). Is the copper in mere admixture with the peas, or is it in actual combination with the albuminous or other constituents?

(2). Does it pass into solution under the influences of the digestive processes?

(3). Is any part or all of the copper thus introduced into the stomach absorbed, or is it eliminated, and, if so, how?

3. *Presence of Copper in Organic Tissues and Products.*—Before proceeding to describe the experiments we have made relative to these questions, we may take note of the fact that from the time of Margraff, Gahn, and Vauquelin, chemists have been acquainted with the presence of copper in organic tissues and products, and in 1856 and 1857, Odling and Dupré made a number of experiments in which they detected traces of copper in bread, flour, wheat, straw, liver, kidney, blood, flesh, eggs, cheese, etc. Thus they found that 6925 grains of human liver furnished 0·013 grain of cupric oxide; while 6682 grains of sheep's liver gave 0·281 grain CuO; 1830 grains of human kidney gave 0·015 grain CuO, while human muscle and blood also furnished traces.

Again, Bergeron and Hôte (*Comptes Rendus*, lxxx., p. 268) have more recently demonstrated the presence of copper in the kidneys and livers of fourteen human bodies.

Brain matter also contains notable quantities of copper, which exists there in actual combination with various principles.*

In view of these facts we deemed it desirable to examine green peas for copper, and accordingly two experiments were made with this object.

4. *Method for Detection of Copper.*—The method pursued throughout this investigation for the detection of copper may be at once stated; it consists in burning the suspected matters with a mixture of pure sodic carbonate and potassic nitrate, causing complete destruction of all organic matter; solution of the fused mass in dilute acid and addition of excess of ammonia and filtration from alumina, phosphates, etc. If copper be present the filtrate exhibits a blue colour, and gives the other reactions of copper (such as the one with potassic ferrocyanide in acetic acid solution). If the fused mass be dissolved in water instead of dilute acid, then, when phosphates are present, the copper remains in the insoluble residue and may be detected in it as above.

5. *Examination of Green Peas for Copper.*—In the one experiment above alluded to, 80 grams of shelled new green peas were examined, and in the other the same quantity to which had been previously added 0·4647 grain $CuSO_4$ or 0·6526 grain $CuSO_4$ 5 H_2O. The natural peas were found to be absolutely free from copper, while there was no difficulty in determining the presence of copper in the case where it had been added, and as this is less than usually occurs in a tin of preserved peas, there should be of course no difficulty in establishing the presence of copper in such an event.

On a subsequent occasion another quantity of 80 grams of a fresh lot of peas was examined for the presence of copper also with a negative result.

6. *State of the Copper present in Preserved Peas.*—In this part of the research it was endeavoured to ascertain whether the liquor contained in the tins with the preserved peas holds any copper in solution or whether it is all in the matter of the peas, and whether during the process of boiling the peas, any copper passes into a state of solution. It was determined in two cases that the said liquor was practically free from copper, the merest vestige being found. This was ascertained by evaporating the liquor to dryness, and fusing the residue as already described with the soda mixture.

The water in which the peas were boiled contained also but the merest vestige.

The copper, therefore, present in preserved peas exists in actual combination, and is not removed by the process of cooking. In the two cases mentioned the quantity present exceeded 1 grain of sulphate of copper to the tin of $9\frac{1}{2}$ or $9\frac{3}{4}$ ounces (about 268 grams).

In the fused mass it exists exclusively in that part insoluble in water.

7. *What becomes of the Copper during Artificial Digestion?*—About 5 ounces of preserved peas of similar nature to those described in preceding paragraph were separated from the liquor, reduced to a pulp, and digested at 40° C. with 300 c.c. of solution containing 1·3566 grm. hydrochloric acid and 35 c.c. of a glycerine solution of pig's pepsin (Bullock's preparation), during 40 hours. The undigested portion was then separated by filtration and the process of artificial digestion repeated upon it under similar conditions during 18 hours. The mass was then again filtered and washed, and the bulky green undigested matter and white skins examined for copper, from which it was found to be now practically free. The whole of the copper had passed into solution, about equal quantities being present in the two digestive extracts.

It may therefore be presumed that in stomachic digestion preserved peas give up their copper to solution, but the extent, probably depends upon the acidity of the gastric juice, the activity of the pepsine ferments, and the time during which the process of gastric digestion is carried on.

8. *Is the Copper introduced into the Stomach absorbed, or what becomes of it?*—On the 13th July, the authors of this paper took each a dose of 0·3 grain $CuSO_4\,5H_2O$, and examined the urine eliminated during the next 48 hours; it was found to be entirely free from copper.

On the 27th July and six following days, we each took again daily, 0·3 grain of cupric sulphate, and examined the total urine for the presence of copper; none but the merest trace was eliminated through this channel.

The fæces secreted on the 30th by one of us was examined, and was found to yield abundant evidence of copper, forming indeed a very considerable proportion of a dose.

Therefore even if a part of the copper be absorbed into the system, another and probably the greater part passes out with the fæces? This corresponds with what is known of the action of ferric and mercurial preparations when taken into the system; a part appears to be absorbed, and locates itself at least temporarily in the organs of the body, while another part passes out with the fæces, colouring them in the one case black and in the other case, green.

9. *General Considerations and Conclusions.*—Inasmuch as copper is nominally present in certain organs of the body as stated above, it must get there in the first place through an introduction into the stomach. How then can we reconcile this fact with the partial secretion at least, of copper with the fæces? Apparently this is very easy of explanation. After gastric digestion and while the contents of the stomach are still acid, a part of the chyme is absorbed into the blood system, and this would seem to constitute the stage at which the copper is absorbed. The greater part, however, of the digested mass

* See 'Relations of Chemistry to Physiology and Pathology,' etc., By C. T. Kingzett. *Pharm. Journ.*, Feb. 26, and March 11, 1876.

passes on through the pylorus, and undergoes a further change in the duodenum where alkaline biliary fluid takes part in the process. The probable result as regards the copper would be its precipitation as phosphate, which would not be changed in the intestines, but would be passed as such with the fæces.

Now, if it be considered that ordinarily one person consumes only about two ounces of preserved peas at a meal, and that this quantity would contain only a fraction of a grain of cupric sulphate; and if it be further considered that only another fraction of this amount is ultimately absorbed into the blood system, it is impossible to defend the opinion of the prejudicial influence of such amount of copper upon health.

This represents our conclusion based upon the experiments we have described, and we think it probable that quite as much copper finds its way into the system through the handling of copper coins, the use of copper vessels in cooking operations, and in the consumption of pickles and such articles which are often prepared in copper vessels. At least we believe preserved peas are absolutely innocuous to health.

10. *Other Confirmatory Evidence of the Innocuous Nature of Traces of Copper present in Foods.*—In a prosecution case conducted before the Marlborough Street Police Court, on Monday, January 22, 1877, Dr. Pavy expressed the opinion that 0·31 of a grain of copper (sulphate ?) would not be injurious to health; this opinion was unsupported by any evidence.

In what has gone before we have supplied the evidence required, and these results are confirmed by and confirmative of other results recently communicated by M. Galippe to the French Academy of Sciences.* He has found that the administration of large doses causes vomiting, but that the same compounds may be taken in increasing amounts for prolonged periods of time without the attendance of any painful symptoms. Galippe cites the experiments of Burq and Ducom, who fed dogs with food that had been cooked and cooled in vessels made of copper and previously exposed to the action of vinegar and salt; the dogs were not at all affected. Moreover, Galippe and his family have lived on food similarly prepared, without experiencing any poisonous effects.

11. *Other Alimentary Substances containing Metallic Compounds.*—It has, in some recent cases of prosecution, been brought to public attention that so-called sugar-cured American hams are coated with a composition containing chromate of lead, which is ordinarily regarded as an irritant to the stomach and an accumulative poison.

Similarly, sweets have been met with which have also been coloured with plumbic chromate, and in one instance one-fifth of a grain of this substance was contained in an ounce of the sweets, while in another case, twice this quantity was detected.

It may be known, that a tolerably large business is now done in colours for sweets and other confectionery, and at various times very objectionable substances have been employed in compounding them, such for instance as salts of lead, chromium and arsenic, and more recently certain aniline colours.

Of late, stannic oxide has come largely into use for compounding these colours, its employment being liked on account of the bright tints which it induces when used as a lake. The colouring matters now chiefly employed are of vegetable origin; cochineal being almost the only animal colouring matter at all in use. Infusions of these colours are made, and they are then precipitated in various ways.

We have recently had occasion to examine a number of these colours of French manufacture, and found that they were largely contaminated with tin, the dry substance containing from 8 to 60 or even 75 per cent. of stannic oxide. Although a little of these colours goes a long way in colouring confectionery, it may nevertheless be very questionable whether the use of compounds containing so much tin should be considered admissible.

For some time past we have been engaged in an attempt to prepare colours of this nature, free from the objection attaching to the presence of such metallic combinations, and hope at no distant period to be successful in this object.

* *Comptes Rendus*, April 9, 1877.

The PRESIDENT, in inviting discussion on this paper, said that as he had been rather prominently connected with some of the cases of prosecution to which Mr. Kingzett had alluded he would prefer to hear observations made by others to offering any himself at present.

Mr. SIEBOLD understood Mr. Kingzett to say that he found a small trace of copper even in fresh peas, and in several other instances he spoke of the same thing; he should like to ask therefore if any utensil were used containing copper or brass, the bunsen burner, or the retort stand, for instance, because a German chemist, named Ulex, proved ten years ago that small traces of copper might be found everywhere--even where they did not exist, that large quantities of liquid could not be evaporated over a bunsen burner the tube of which was made of brass without finding ultimately small traces of copper. Secondly, he should like to know how the copper had been estimated quantitatively; if it was by the method of precipitation in sulphide of hydrogen, and comparing the colour produced with that from a standard solution of copper, it was to a certain extent objectionable. His experience did not extend to copper, but this method was used to determine minute quantities of lead, and he had found that different preparations of lead produced a different shade of colour, chloride, sulphate, or nitrate producing different results. Some time ago in testing a sample of tartaric acid with a small trace of lead in it the discoloration produced by sulphuretted hydrogen was of a slate colour, instead of the brownish yellow generally obtained from water with lead in it, and on trying various preparations of lead he found they all differed in colour. Lastly, he protested against the notion that because copper was readily eliminated, it could not have any injurious effect. There were numerous medicinal agents, such as iodide of potassium, which passed through the system very quickly, and yet they had a physiological action, and in a large dose would have a poisonous action. Morphia was eliminated with the fæces, and not a trace of it with the urine; yet no one would deny that it passed through the system and acted as a poison.

Dr. PAUL said this argument did not apply to the case in point because the copper did not pass through the system at all, it was eliminated without even getting into the system.

Dr. ROWE said he had examined water from a stream in the county of Cornwall, which had been drunk from for many years by the inhabitants in the neighbourhood, and he found it contained large quantities of copper, in fact, so much that it could be profitably precipitated from it by iron, and yet those who used it appeared to suffer no inconvenience. At another place, called Llanarth, water similarly impregnated was used. Metallic matters were sometimes taken in large quantities and eliminated through the alimentary canal without apparently entering the constitution; for instance, some persons were not at all affected by taking iron, while others were greatly benefited by it. These instances fully confirmed his own idea that copper was not a blood poison or irritant, unless it were taken in the form of sulphate, or in some combination which rendered it an irritant.

Mr. THOMPSON said he had given a dog a grain of copper a day, Sundays excepted, for eighteen months, and the animal appeared to be quite unaffected by it.

Mr. WILLMOTT said he had made some experiments with regard to the preservation of meat, and he came to the conclusion that it was absolutely necessary to exclude the air from it. He should like to know the results of the experiment undertaken by the President some time ago with paraffin, in this direction.

The PRESIDENT remarked that the general subject of meat preservation was not raised by the paper before them.

Mr. CHIPPERFIELD reminded the meeting that though vegetation was destroyed for miles round in the neighbourhood of copper works, and the flavour of copper could even be tasted in the air, still the longevity of those employed in the works would compare favourably with any other class of the population.

Dr. WRIGHT mentioned several cases which had been recently reported where persons had suffered more or less severely from partaking of preserved fruit or beverages, in which traces of lead were discovered. One was the case of a man who had been in the habit of obtaining beer at an early hour in the morning, which, from standing in the pipes during the night, had become contaminated, and after some months he showed well marked symptoms of lead poisoning. In the same way the daily taking of minute quantities of copper might produce evil results after a time, though one or two doses might cause no inconvenience.

Dr. STEVENSON MACADAM dissented from the statement of Mr. Siebold that there was any uncertainty in determining the quantity of metallic poison present by the colour test, if the operation was properly carried out. In the case of lead, if different acids were employed at different times a difference in the result might be found, but in water testing, which was specially referred to, if acetic acid were regularly used and sulphuretted hydrogen the results would be fairly comparable one with the others, and would indicate the quantity of lead present in the water. He had known several cases in which injurious effects had followed the use of preserved provisions, where it was evident the tin had been acted upon. He did not consider the presence of copper in the fæces as a positive proof that it had not been taken up by the system.

Mr. GROVES said there were some remarkable experiments on the use of copper salts reported in the *Journal de Pharmacie* a few months ago. In one case an individual had pushed it so far that his hair and nails became of a green colour, and yet he was reported not to have suffered in health.

Mr. ROBBINS asked if Dr. Rowe could state the quantity of copper found in the water he referred to.

Dr. ROWE said the sample he referred to last contained sixteen grains of copper in the form of sulphate per imperial gallon, and it was found remunerative to precipitate it by means of iron. He lived in the very heart of a copper mining district, in fact all the minerals spoken of that day were found within a thousand yards of his house, and all the streams were more or less affected. Still they were drunk of by animals, and more or less by human beings, though of course the water companies endeavoured to obtain their supplies from pure sources.

The PRESIDENT said the impression produced on his mind by the discussion was that the proposition that copper was not injurious to the system had been rather overproved. If they were to admit all that had been stated they must go to the extent of saying that not only copper but other admittedly poisonous substances might be introduced into the system, as no doubt they might be under certain circumstances, without producing any marked injurious effects. Mr. Chipperfield alluded to the effects which were not observed in the neighbourhood of copper works, where, as he said, you might taste the copper in the air. His own impression was that it was not copper but sulphurous and arsenious acid which one tasted; they knew that vegetation was destroyed to a very great extent, and by looking at the miserable horses and cows with swelled joints it was evident that animal life also suffered to an enormous extent. True, upon going into the works one saw both young and old not manifesting any signs of injury, but was it to be inferred from that that arsenious acid might be thrown into the atmosphere with impunity, and that it might be inhaled also without the risk of injury? He should hesitate long before coming to such a conclusion. The instances mentioned by Dr. Rowe were not conclusive to his mind, because he looked upon cases of that description as being of the nature of negative evidence, which told for very little when put against the positive evidence that had from time to time come under his notice. He might mention one very well authenticated case in which a merchant in London had been using, in his family, some preserved greengages. After some time he began to suffer in health with colicky pains, disagreeable taste in the mouth, swollen tongue, and other symptoms of metallic poisoning, and the preserved greengages being analysed at St. Bartholomew's Hospital were found to contain copper. Yet no other member of the family suffered at all. He could give another instance, where, the well being out of order, a family had for some time to make use of rain water from a leaden cistern, and the lady of the house suffered from lead poisoning, but no one else, although all used the same water. Positive evidence of this description was far more conclusive than mere negative evidence. There were apparently some persons who were highly susceptible to influences of this description, and they would suffer materially where others would be quite unaffected. There was a question which was still debated, as to the extent to which persons suffered in health from occupying rooms hung with arsenical papers; and here again there were individual instances in which ill effects were experienced, whilst others would escape. Now this was a practical question, and it had been so treated by Mr. Kingzett, who referred to prosecutions having taken place for the sale of green peas which were found to contain copper; and he (Professor Redwood) had been engaged more prominently perhaps than many in such prosecutions. He had found that green peas imported from France contained copper, to the extent of at least 2 grains of sulphate in a tin of 8 or 9 ounces, and when he considered that the public who purchased these articles did so in ignorance of the fact that they contained something which might be injurious, he had come to the conclusion that no dealer or manufacturer was justified in supplying an article of food which contained an unnecessary addition of a poisonous substance, put there merely to give a particular colour, without notice being given of its presence. He did not profess to form a medical opinion on the subject himself, but as many medical men considered this addition injurious to heath, he held that where such an article was sold, it should have a plain indication on the label that the contents were green peas "preserved with copper," and then the public might use them or act as they thought proper. This was the advice he had given to a dealer some time ago, who had a large stock of these articles on hand, and asked him what he should do with them. He said, if it was necessary that they should be sold, put a label on them indicating the presence of copper, and then the public would be responsible if any ill effects ensued.

Mr. KINGZETT in reply to Mr. Siebold's remarks said he had found that with ordinary care, the use of a brass bunsen burner did not cause the introduction of traces of copper into any matters which might be under examination for that substance, but to avoid even the possibility of an error arising from this source, Dr. Paul and he had employed an iron burner and platinum vessels. No great accuracy had been attempted in determining the amounts of copper, not deeming it a matter of great importance for their inquiry, but by ascertaining the intensity of colour presented by an ammoniacal solution of the copper, a good idea, better perhaps than by the sulphide colorimetric method, could be got. Dr. Wright had alluded to several cases of metallic poisoning that had been reported in the daily papers and with which they were all acquainted, but it was futile to institute comparisons between investigations which had been effected, and any it might be desirable to make. What Dr. Paul and he (Mr. Kingzett) had advanced in their paper were facts relative to copper and did not apply in any measure or manner to lead, tin, or zinc. One gentleman had suggested that although the copper was found in the fæces, it might previously have been in the system, but this idea was entirely opposed by the evidence. It should be considered that the various digestive processes take but a few hours for their completion, and that it is only during a particular part of that time, viz., while the food is yet in the stomach, that it is possible for the copper to be absorbed into the system. Now it had been shown that employing an imitative digestive process as much as forty or fifty hours were required to render soluble the small amount of copper contained in that quantity of peas which would be eaten at a meal. The probability therefore was that the greater part would pass through the intestinal canal, without experiencing any change at all, and if it were required to show that the copper is not absorbed in any considerable measure, surely the fact that it is found in the first fæces passed after such a meal as he had described was sufficient to prove this. It was gratifying to hear from the meeting so much negative evidence (as it had been termed by Professor Redwood), confirmative of the positive evidence adduced by Dr. Paul and himself. People were too much carried away by opinion, itself a stumbling block to investigation. What was medical opinion worth? nothing—unless it were based upon those precise facts necessary to its proper formation, and until Dr. Paul and he had investigated the physiological behaviour of the copper eaten with preserved peas, neither chemists nor medical men were competent to frame an opinion regarding it. The decisions arrived at in the various prosecutions referred to in the paper had depended upon the opinions of medical men or chemists, and inasmuch as these opinions were valueless, the decisions were unjust and affected trade in a mischievous manner. He (Mr. Kingzett) could not enter into the question as to whether a person was entitled to sell peas preserved green by the use of copper; that was irrelevant to the inquiry of Dr. Paul and himself; but he would say that if a person ate such peas, no harm could possibly result to his health from so doing.

A vote of thanks having been awarded to the authors of the paper, the Conference adjourned for luncheon.

Upon resuming, the next paper read was—

Analyses of Preserved Carrots, Potatoes, Cabbage, and Mixed Vegetables.

BY PROFESSOR ATTFIELD.

The influence of desiccation on vegetable substances and the extent to which preserved vegetables differ from fresh vegetables, if indeed they differ at all or in any important degree, are matters of much interest to the pharmacist and medical practitioner who frequently use dried herbs and dried parts of plants, and to the general public who largely use preserved vegetable foods. As regards actual chemical alteration probably little takes place if the perfectly sound and fresh fruit, root, leaf, stem, etc., be at once and rapidly dried at a moderately low temperature, or be quickly subjected to the selected process of preservation before any fermentative action commences. Possibly, however, active medicinal substances, such as alkaloids, may suffer alteration during reduction to the dry state, a point which will be cleared up as scientific investigation of these bodies becomes more extended. Of course, in cases where the process by which any given parcel of food has been preserved is not known, there will arise the suspicion that edible portions which do not readily lend themselves to the process may have been excluded, or that contusion of stems or bulky fruits, etc., may have resulted in partial loss of juice and of the alimentary bodies therein dissolved. The question also arises, does desiccation or other mode of preservation so physically alter constituents not chemically altered, as to impair the value of the vegetable substance, either as food or as medicine. The whole subject is a very large one, and to its full elucidation the present paper is only a very small contribution.

A few months ago, by request of the Chairman of the Admiralty Committee appointed to consider the causes of the outbreak of scurvy in the recent Arctic Expedition I analysed samples of vegetables taken from the residual stores of the "Alert" and the "Discovery," on the return of those ships to England.

The articles sent to me for analysis were :—

1. Fresh carrots, preserved in hermetically sealed tin cases.
2. Dried potatoes.
3. Dried compressed cabbage.
4. Dried compressed mixed vegetables.

These samples I so analysed as to admit of comparison being made between their composition and that of good average specimens of the respective vegetables recently removed from the ground.

The samples were all in good condition. The carrots from the tin were whole, sweet, juicy, and of full flavour; the dried fragments of potatoes were perfectly sound; the dried compressed cabbage was of good colour, crisp, and had the characteristic smell of the vegetable; the dried compressed mixed vegetables had an appetizing appearance, and the aroma of well-made vegetable soup.

1. *Carrots (cooked).*

The samples could not be distinguished in appearance from cold, soft, recently cooked carrots. Evidently they had been preserved in the tin by some mode of heating or steaming, similar to that employed in preserving meat in tins. Submitted to analysis they yielded :—

	In 100 parts by weight.	
Water	89·13	
Dry vegetable matter	10·21	10·87
Dry mineral matter	·66	
	100·00	

The 10·21 parts of dry vegetable matter consisted of :—

Albuminoid matter	·98
Celluloid matter or fibre	1·14
Fatty matter	·29
Other non-nitrogenous matter	7·80
	10·21

And the 0·66 of dry mineral matter yielded (together with other less important substances) :—

Alkalies (as oxides)	0·31
Phosphoric acid (that is, phosphoric anhydride)	0·08

Carrots, like some other vegetables, absorb large quantities of water when cooked in that liquid. A fair average proportion of water in uncooked carrots is 85 per cent., a proportion which does not naturally vary very widely. That is to say, if 100 pounds of uncooked carrots were thoroughly desiccated, 15 pounds of solid matter would remain, and 85 pounds of water be dissipated—passing away as steam. Now, 100 parts of the cooked carrots just analysed only yielded 10·87 parts of solid matter; or, in other figures, 15 pounds of solid matter would be contained in 138 pounds of these soft, moist, cooked carrots. But assuming, as one must do for purposes of comparison, that we are dealing with the carrots in the uncooked condition—assuming that we have, not 138 parts of cooked carrots, containing a quantity of water absorbed during cooking, but 100 parts of uncooked carrots in the natural condition—assuming, in short, that the carrots when fresh contained the average proportion of 85 per cent. of water, then the composition of the sample would be as follows :—

Composition of the Carrots when uncooked.

(Based on the fair assumption that the fresh carrots contained the average natural and normal proportion of water, namely, 85 per cent.)

	In 100 parts by weight.
Water	85·00
Dry vegetable matter	14·09 } 15·00
Dry mineral matter	·91 }
	100·00

The 14·09 parts of dry vegetable matter consisting of:—

Albuminoid matter	1·34
Celluloid matter or fibre	1·58
Fatty matter	·40
Other non-nitrogenous matter	10·77
	14·09

And the 0·91 of dry mineral matter containing (together with other less important substances):—

Alkalies (as oxides)	0·43
Phosphoric acid (*i.e.* anhydride)	0·11

But, in truth, whether preserved carrots contain more or less water, is a matter of inferior importance. The question of chief moment is whether or not the components of this food bear to each other a proper ratio, whether or not any of these components have been "washed out," so to say, during the preserving process, the food maintaining its sensible characters, but having lost some essential constituent, some valuable property. The answer to this question in the case of the sample analysed was at once afforded on comparing the figures (just given) with those (in the next table) showing] the average composition of good sound carrots freshly removed from the ground. It was then at once evident that the preserved carrots were as sound and good as the fresh natural vegetable, and that there was no practical difference between the carrots from the sample tin and carrots cooked within a few hours of their removal from the ground.

Average Composition of fresh uncooked Carrots.

(The figures give averages—calculated by Wolff and Knop—of all trustworthy analyses published up to August 1865.)

	In 100 parts by weight.
Water	85·0
Dry vegetable matter	14·0
Dry mineral matter	1·0
	100·0

The 14 parts of dry vegetable matter consisting of:—

Albuminoid matter	1·5
Celluloid matter or fibre	1·7
Fatty matter	·2
Other non-nitrogenous matter	10·6
	14·0

And the 1 part of dry mineral matter yielding (togeher with other less important substances):—

Alkalies (as oxides)	0·59
Phosphoric acid (*i.e.* anhydride)	0·12

Only in the proportion of "alkalies" was any important difference observable. Instead of an average of, say, 0·6 per cent., or a minimum of 0·5, there were only 0·43 per cent. in the original uncooked carrots. The deficiency is not great, and was quite accounted for on examining the small quantity of water which had exuded from the carrots in the tin. This water was rich in alkalies. But, as just stated, it was small in quantity, and, moreover, would probably be turned out of the tin with the carrots at meals, and be swallowed with the vegetable.

I may add that by direct experiment I find that carrots absorb large quantities of water during cooking, hence the assumption that the cooked carrots contained additional water to that occurring in them in the natural state was well founded.

2. *Dried Potatoes.*

The sample yielded:—

	In 100 parts by weight.
Water	12·17
Dry vegetable matter	83·57
Dry mineral matter	4·26
	100·00

The 83·57 parts of dry vegetable matter contained:—

Albuminoid matter	9·81
Celluloid matter or fibre	1·83
Fatty matter	·28
Other non-nitrogenous matter	71·65
	83·57

And the 4·26 of dry mineral matter yielded (together with other less important substances):—

Alkalies (as oxides)	2·36
Phosphoric acid (*i.e.* anhydride)	0·53

Composition of the original undried Potatoes.

(Based on the fair assumption that they contained the average natural proportion of water, namely, 75 per cent.)

	In 100 parts by weight.
Water	75·00
Dry vegetable matter	23·79
Dry mineral matter	1·21
	100·00

The 23·79 parts of dry vegetable matter consisting of:—

Albuminoid matter	2·80
Celluloid matter or fibre	·52
Fatty matter	·10
Other non-nitrogenous matter	20·37
	23·79

And the 1·21 parts of dry mineral matter containing (together with other less important substances):—

Alkalies (as oxides)	0·67
Phosphoric acid (*i.e.* anhydride)	0·15

Average Composition of Potatoes.

(The mean of many published analyses.)

	In 100 parts by weight.
Water	75·0
Dry vegetable matter	24·1
Dry mineral matter	·9
	100·0

The 24·1 parts of dry vegetable matter consisting of:—

Albuminoid matter	2·0
Celluloid matter or fibre	1·0
Fatty matter	·2
Other non-nitrogenous matter	20·9
	24·1

And the 0·9 of dry mineral matter containing (together with other less important substances):—

Alkalies (as oxides)	0·55
Phosphoric acid (*i.e.* anhydride)	0·17

A glance at the second and third of these three tables relating to the sample of potatoes, will show that the dried potatoes supplied to the ships were, from the chemical point of view, of good quality, containing all the chief components of the sound normal vegetable, and containing them in natural proportion. The first table interpreted in the light of the second and third shows, further, that one pound of such dried potatoes represented three and a half pounds of undried potatoes.

Not only were the potatoes chemically good, but their general condition was excellent. No trace of mouldiness, sourness, or other undesirable quality could be detected.

3. *Dried compressed Cabbage.*

The sample yielded :—

	In 100 parts by weight.
Water	19·93
Dry vegetable matter	74·18
Dry mineral matter	5·89
	100·00

The 74·18 parts of dry vegetable matter contained :—

Albuminoid matter	13·01
Celluloid matter or fibre	9·45
Fatty matter	2·56
Other non-nitrogenous matter	49·16
	74·18

And the 5·89 of dry mineral matter yielded (together with other less important substances) :—

Alkalies (as oxides)	1·75
Phosphoric acid (*i.e.* anhydride)	·64

Composition of the original undried Cabbage.

(Based on the fair assumption that it contained the average natural proportion of water, namely, 89 per cent.)

	In 100 parts by weight.
Water	89·00
Dry vegetable matter	10·36
Dry mineral matter	·64
	100·00

The 10·36 parts of dry vegetable matter consisting of :—

Albuminoid matter	1·43
Celluloid matter or fibre	1·03
Fatty matter	·28
Other non-nitrogenous matter	7·62
	10·36

And the 0·64 parts of dry mineral matter containing (together with other less important substances) :—

Alkalies (as oxides)	0·19
Phosphoric acid (*i.e.* anhydride)	0·07

Average Composition of Cabbage.

(The mean of several published analyses.)

	In 100 parts by weight.
Water	89·0
Dry vegetable matter	9·8
Dry mineral matter	1·2
	100·0

The 9·8 parts of dry vegetable matter consisting of :—

Albuminoid matter	1·5
Celluloid matter or fibre	2·0
Fatty matter	·4
Other non-nitrogenous matter	5·9
	9·8

And the 1·2 of dry mineral matter containing (together with other less important substances) :—

Alkalies (as oxides)	0·63
Phosphoric acid (*i.e.* anhydride)	0·20

The figures of these tables of the composition of the sample of cabbage, show that while the vegetable constituents are in good proportion, there is considerable deficiency of mineral matter, especially of the saline material termed alkaline phosphate. In the first place, 0·64 per cent. of mineral matter is not only about half the average proportion, but is much less than the minimum hitherto obtained from cabbage. And in the second place, only about one-third of this already small amount of mineral matter is "alkalies," whereas half the mineral matter should be of this character. Thirdly, the phosphoric acid, or rather phosphoric anhydride, is present to only about one-third the normal proportion.

As to the physiological import of so great a deficiency of alkaline phosphates in this sample of cabbage, I do not pretend to judge. At the same time, eminent authorities consider that these saline constituents of vegetables contribute very materially to the food value of the vegetables.

As to the cause of the deficiency, the chemical results are suggestive of loss of juice from the original cabbage. If the fresh cabbages were submitted to pressure before drying to such an extent as to bruise the leaves and cause an outflow of juice, that would exactly explain the facts revealed by the analysis.

I may add that experiments undertaken with the view of ascertaining whether the cabbage yielded as much organic acid as a sample taken from my own garden, also pointed to loss of juice from the original cabbage.

One pound of dried cabbage represents, in weight, seven pounds of the fresh vegetable.

4. *Dried compressed mixed Vegetables.*

The sample yielded :—

	In 100 parts by weight.
Water	15·61
Dry vegetable matter	80·29
Dry mineral matter	4·10
	100·00

The 80·29 parts of dry vegetable matter yielded :—

Albuminoid matter	8·11
Celluloid matter or fibre	4·94
Fatty matter	1·82
Other non-nitrogenous matter	65·42
	80·29

And the 4·1 of dry mineral matter yielded (together with other less important substances) :—

Alkalies (as oxides)	1·82
Phosphoric acid (*i.e.* anhydride)	·47

Composition of the original undried mixed Vegetables.

(Based on the assumption that they contained 85 per cent. of water.)

	In 100 parts by weight.
Water	85·0
Dry vegetable matter	14·3
Dry mineral matter	·7
	100·0

The 14·3 parts of dry vegetable matter containing:—

Albuminoid matter	1·5
Celluloid matter or fibre	1·0
Fatty matter	·3
Other non-nitrogenous matter	11·5
	14·3

And the 0·7 parts of dry mineral matter containing (together with other less important substances):—

Alkalies (as oxides)	0·31
Phosphoric acid (*i.e.* anhydride)	0·08

There are no published analyses of "mixed vegetables," and if there were, the mixture might not be similar to that of the sample. I should form the opinion that the sample of mixed vetegables, like that of the cabbage, though not to the same extent, had lost a portion of its original juice—perhaps by pressure—and, consequently, a portion of its valuable saline constituents.

Organic Acids.—Some experiments, commenced with the object of ascertaining the proportion of organic acids in the vegetables, led to no useful results. Comparative experiments with fresh and preserved vegetables were tried, but were abandoned. Larger samples of the preserved vegetables, and much time, would be necessary for such an investigation.

Conclusions.

The results of the analyses and general examination may be re-stated shortly as follows:—

1. The carrots were of good quality.
2. The potatoes were of good quality.
3. The cabbage was deficient in important saline constituents.
4. The mixed vegetables are probably somewhat deficient in saline substances.

Whether or not these conclusions may be applied to the similar preserved vegetables supplied to the public generally cannot be decided until more analyses have been published.

The PRESIDENT said he should like to know if Professor Attfield had any reason to suppose that these vegetables had been preserved by the method commonly adopted. Some years ago several papers were published on the preservation of vegetables by a process of drying as well as pressing, and if that method were adopted he could not understand how the deficiency noticed arose. He presumed the desiccation was mainly caused by pressing out the juice; if, however, vegetable substances could be preserved without the separation of any of the component parts and without any deterioration taking place it might be of importance in pharmacy. Dried medicinal herbs underwent considerable changes, and sometimes became inert, and attempts had been made to preserve them in a humid condition, but hitherto these efforts had proved failures.

Mr. GROVES asked if Professor Attfield had discriminated between potash and soda in his analyses, because it was supposed that scurvy was due to the absence of potash in the food.

The PRESIDENT said it would be interesting to know if any material change had taken place in the colour of the vegetables.

Mr. E. SMITH remarked with reference to the preservation of medicinal herbs that a great mistake is made in drying them at too high a temperature. Dry air at a comparatively low temperature was the best for such a purpose.

Mr. WILLMOTT asked what Mr. Smith considered a high temperature for preserving herbs.

Mr. SMITH said it was very common to have a room specially heated for drying hemlock, henbane, and such plants, but if a low temperature were employed with dry air there would be a much better product. It would be all the better if the air could be passed over ice if it were kept dry.

Dr. SYMES thought the thing to aim at was to strike the happy mean between the use of too high a temperature and keeping the plants about too long in the process. If vegetable substances were kept for any length of time, especially if they were not in very thin layers, a process of fermentation was likely to be set up, and although they might appear green they would be changed more or less in their character. It should be ascertained by experience how long it would be safe to keep them about and then as low a temperature as possible employed.

Mr. GREENISH said the green colour was due to the presence of chlorophyll, an active agent in the process of assimilation, and it was a question whether a temperature capable of acting on so delicate a substance as chlorophyll would necessarily have any influence on the product of assimilation previously formed; the loss of that bright green colour did not necessarily imply that the active principle was injured and he should question whether the loss of the green colour really injured the product. He should like to know if Mr. Smith had observed any instances of henbane being thus injured.

Mr. SMITH said this was not an easy question to answer; but he thought he had observed that a better tincture was obtained from hemlock and henbane when dried at a low temperature. It was fairly reasonable to suppose that a high temperature tended to produce a decomposition of the active principle.

Mr. UMNEY said he had had many years' experience in the drying of medicinal herbs, more especially those of conium, digitalis, belladonna, and henbane. Henbane was the most difficult herb to dry, on account of its extreme succulence. He generally employed frames made of cane threaded into thin pieces of deal about four or five feet long, the canes being arranged about half an inch apart. These were put into a room built round a steam boiler, and he had generally found if these frames were put into the room at two or three o'clock in the afternoon they might be taken out next morning with their contents perfectly dry, without any sign of decomposition. On the other hand he had seen large quantities of belladonna hopelessly spoiled from attempting to force the process. Henbane was chiefly supplied to the London market by growers in Lincolnshire and Cambridgeshire, and Oxfordshire, and the leaves came to market kiln dried. The temperature of the room about the boiler was from 140° to 150° Fahr., probably sinking to 110° during the night.

Mr. SMITH asked what Mr. Umney would consider a sign of decomposition in henbane leaves.

Mr. UMNEY said he had seen henbane leaves, when packed too thickly upon the drying frames he had described, quite brown and literally stinking, whereas a leaf properly dried maintained its green character and when it was touched it crumbled to powder. To finish the leaves elegantly they should be rubbed through a sieve and the midribs taken out.

Mr. BALKWILL asked whether in the case of a plant such as henbane, the leaves only of which were used, it would be better that the leaves should be separated from the stalk before drying, or in other words whether the sap receded during drying from the leaf into the stem or from a succulent stem into the leaf. In reference to drying herbs, his own experience this summer had been in drying digitalis, conium, and one or two others, that very unsatisfactory results were obtained by drying them in a room where there was not a thorough circulation of air. The remarks of the President had turned his thoughts to a preparation which was very important, and would no doubt be much more used, if it were not so uncertain, namely elaterium. If the juice or the fresh fruit could be preserved, it would be a very great advantage because practically no difference was observable between the active elaterium extract and the one inert from age. Again, would it not be possible to preserve the expressed juices of plants in hermetically sealed tubes without the addition of any spirit? In the presence of so many practical men he threw it out at a suggestion. He had a hope that the juices as freshly pressed from medicinal plants might in this way be preserved for dispensing. The Pharmacopœia expressed juices were unsatisfactory, inasmuch as they do not keep well.

Mr. WILLMOTT feared that any such attempt would prove a failure. He believed the sources of decomposition resided rather in the thing itself than in the atmosphere, and that unless the sealed tube was submitted to a temperature sufficient to destroy any germs present in the fluid it would be certain to decompose.

Professor ATTFIELD said he had no information how the substances he had examined were dried. The carrots in the sealed tins were perfectly fresh and juicy. With respect to colour, the dried cabbage had a green colour, though perhaps not quite so green as the fresh vegetable. When soaked for two hours in water it absorbed nearly the normal amount of water present in fresh cabbage, and had a most appetizing appearance. When the dried carrots were soaked for a few hours, they swelled up and were found to have absorbed about $\frac{9}{10}$ as much moisture as would be present in the fresh vegetable. He had reason to believe that nearly the whole of the alkali-metal salts present were those of potassium. He knew very little with regard to the best temperature for drying herbs, but from what he did know, he quite agreed with the remarks of Mr. Smith and Dr. Symes. He hoped the remarks of Mr. Balkwill, suggestive as they were of unequal medicinal activity of different parts of herbs, would be taken up by some pharmacist, and form the subject of a future communication to the Conference or to the Pharmaceutical Society.

(*To be continued.*)

Obituary.

Notice has been received of the death of the following:—

On the 11th of September, 1877, Mr. George Swire, Pharmaceutical Chemist, Brixton Hill, Surrey. Aged 55 years. Mr. Swire was a founder of the Pharmaceutical Society, having been an Associate from 1842 to 1853 and a Member since 1854.

We have to announce the sudden death of Mr. William Valentine Wright, Pharmaceutical Chemist, of Highland Bickley Park, senior partner in the firm of Wright, Layman and Umney, Wholesale Druggists, of Southwark Street, London, which took place on Monday last (17th inst.) at Dundee. Mr. Wright, who was on a tour with his son through Scotland, was attacked with erysipelas, which proved most rapidly fatal. Mr. Wright was 52 years of age. We are informed that the style of the firm will remain unaltered, and that the home management of the business will be conducted by Mr. C. Umney.

Correspondence.

**** ***No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.***

The Composition of Essential Oils.

Sir,—Dr. Tilden in his letter of last week makes the following observation: "Mr. Kingzett's announcement that he had demonstrated the existence of a terpene of the formula $C_{10}H_{16}$ in the oils of caraway, bergamot, lemon, etc, is therefore superfluous." The justice of Dr. Tilden's remark will be best tested perhaps by a brief comparison of researches generally relating to essential oils.

Incidentally Dr. Tilden's investigations have covered much the same theoretical ground as my own, and his results being obtained after mine, and his conclusions being identical with mine, they are therefore confirmative of mine. On the one hand, I have shown that all hydrocarbons of $C_{10}H_{16}$ formula give peroxide of hydrogen when subjected to a process of limited oxidation. He has shown that the same hydrocarbons yield a derivative of the formula $C_{10}H_{15}$ (NO); I have shown that the $C_{15}H_{24}$ bodies do not give H_2O_2, and he has shown that they do not yield $C_{10}H_{15}$ (NO). From my results I predicted that certain $C_{15}H_{24}$ hydrocarbons would not yield cymene $C_{10}H_{14}$, inasmuch as I had previously ascertained that not only does cymene yield H_2O_2 as above, but that all hydrocarbons which contain it as a proximate nucleus give H_2O_2. Dr. Wright subsequently gave the proof to my prediction—for instance, in the case of the hydrocarbon $C_{15}H_{24}$—from clove oil.

Almost every worker upon the subject of essential oils has observed and recorded characters which indicate that even among the bodies of $C_{10}H_{16}$ formula, there are modifications. Dr. Tilden has confirmed this fact, and is enabled by the characters of his derivatives (all of the composition $C_{10}H_{15}$ (NO,)) to give greater precision to this truth. It will thus be seen that apart from the great practical interest of Dr. Tilden's work, it has advanced the theory of chemistry in no wise beyond confirming propositions already established.

Therefore, if anythiug be superfluous which has only a practical value, the whole of Dr. Tilden's research is superfluous, in the same sense as my observation is so characterized by Dr. Tilden. Dumas may have determined the vapour density of turpentine and similar oils including lemon, but that is not to say that he did also that of caraway, bergamot, and many others which were classed into a common group chemically identical, by means of a general reaction which I have worked out—a classification at which Dumas did not arrive, but one since confirmed by Dr. Tilden.

I do not even forget that Oppenheim, in 1871, showed that the terpenes yield one and the same cymene, but Oppenheim did not show that terpenes yield H_2O_2, because they also yield cymene, nor did he show that all hydrocarbons yielding cymene give peroxide of hydrogen.

In view of these facts, I must beg to differ from Dr. Tilden, and maintain that not only was my observation following the reading of his paper not superfluous, but on the other hand very significant.

I have no ambition to discuss the matter further, and while I acknowledge the value of Dr. Tilden's work, I attach an equal value to my own, even to that particular part of it which your correspondent has termed "superfluous."

Charles T. Kingzett.

1, *Victoria Street, S.W.*

The Conference Grants.

Sir,—There is not the slightest occasion for my friend Dr. Tilden to defend himself for accepting a Conference grant. That acceptance and its outcome are matters on which the Conference may be congratulated. Indeed respecting all highly chemical researches which may reasonably be expected to include truths interesting and useful to pharmacists, such as the aconitine investigations and the examination of many of the essential oils, I would say that the more the Conference is afforded the opportunity of aiding them the more will pharmacy be benefited. But beyond these is a well defined class of absolutely purely chemical subjects, as well as subjects which, annually continued, end in becoming purely chemical; and grants in aid of such subjects may, I think, now more appropriately be made from the more recently established and rich research funds of the more purely scientific societies. The Conference has but little money to spend. That little is subscribed by men who follow a branch of applied chemistry. Surely it is not too much to expect that the researches it aids should at least offer promise of pharmaceutical application.

John Attfield.

Asplands, Watford, Sept. 19, 1877.

P.S.—In giving Dr. Tilden's paper to the meeting at Plymouth, I am sorry I inadvertently overlooked the paragraph relating to Dr. Wright's cymenes.

E. W. Cleaver.—We are not acquainted with any such law.

S.—By redistillation of the oil of turpentine.

O. Richards.—*Polygonum Persicaria.*

J. Macnicol.—*Acacia Concinna;* used like soap berries.

Syrupus.—(1) *Hypnum populeum.* (2) *Tortula fallax.* (3) *Didymodon rubellus.* (4) *Ceratodon purpureus.* (5) *Lecidea vesicularis.*

Thos. L. Edden.—*Cerastium triviale.*

G.—The plant sent looks like *Cardamine amara*, but it is impossible to say without flowers.

J. Arthur Floyd.—(1) Button galls produced by *Neuroterus numismatis*, Oliv. (2) Oak spangles, galls produced by *Neuroterus lenticularis*, Oliv.

W. T. T.—Chemical Society, Burlington House, Piccadilly.

Commerce.—We are not aware of there being any such register.

Communications, Letters, etc., have been received from O. Wallis, F. S. Morton, Pharmacist, R. G. Mumbray, B.B.B., F. L. Phillips, T.T.C., Jas. Houlton, Quæsitor Sum, Phosphate, E. Cardwell, F. J. Barrett, Joseph Leay, E. Humphries, "Burton."

"THE MONTH"

Already the damp mists in the evening and morning betray the presence of autumn, and the rich yellow and red tints of the foliage show that the time of flowers is well nigh past and that fruits must now take their place.

Comparatively few medicinal plants are to be found in blossom this month, but several are still conspicuous by reason of their fruits. The baccate fruits of the belladonna, which look like black cherries, are now quite ripe and present a most tempting appearance. Probably few, except the residents in chalky districts, are familiar with this plant, the woody nightshade (*Solanum Dulcamara*, L.) being frequently mistaken for it. That plant has, however, bright scarlet fruits, which, like those of belladonna, are baccate, *i.e.*, berry-like, for they differ from the typical berry in being superior and having axile placentation.

Solanum nigrum, a weed in gardens and waste places, has leaves resembling those of *Dulcamara*, except that they are never auriculate, but differs in having white flowers, and the fruits arranged in a small umbel, and of a black colour. It is also a much smaller plant, being rarely more than eighteen inches high.

Several of the September plants are still in blossom, among which the hop with its handsome festoons of strobiles still forms a conspicuous object in the hedges; while the bright blue flowers of the borage and the cichory, and the white blossoms of the chamomile, feverfew, and yarrow are still to be seen here and there, where, owing to having less sunshine, they are a little later than usual.

Almost the only fresh plants in flower this month are the colchicum and saffron crocus. The former is a singular plant in several respects. The flowers arise from the ground before the leaves, the latter not appearing until the following spring. The plant, although generally distributed over England, is very local, and is only found abundantly in a few districts, apparently preferring damp calcareous meadows. The London market is said to be supplied chiefly from Gloucestershire and Oxfordshire. Its large pale purple, or reddish lilac blossoms are very like those of the common crocus, and as in that plant many of them arise one after another from the same corm.

The corm, or solid underground stem, is about the size of a tulip bulb, and is rounded on one side and flattened on the other. In the flat side there is a deep longitudinal furrow, which is occupied by the flowers. It is this furrow which gives to sliced colchicum corms the lateral indentation by which they are so easily distinguished. The blossom does not arise from the large corm, but from the young one at the base of the furrow, which after flowering enlarges, and forms the corm of the next year. On this account the flower appears to be placed laterally as regards the corm. That the large corm really belongs to the last year's plant is evident from the depression at its apex where the flowering stem of the former year arose. The dark brownish black tunic (consisting of modified leaves) surrounding the corm is prolonged a short distance above it, and the flower stem is enclosed in a white, membranous, sheathing or spathaceous bract. The six stamens are attached to the perianth, and are furnished with six versatile anthers, which are are commonly said to be extrorse. They do not, however, open dorsally, but at the sides, so that the pollen neither faces the style nor the perianth. If a flower be examined in the young state before the anthers have opened, it will be found that the filament is attached at the side of the anther facing the styles; this cannot so easily be observed afterwards, because of the versatile character of the anthers. The stigma is very small and the styles are very long and thread-like, and may be traced down below the surface of the ground, the three-celled ovary being hidden within the tunic of the corm, and not appearing above ground until the following April, when the tuft of broad leaves surrounding it is the only sign by which its presence may be detected. The capsule affords an excellent example of septicidal dehiscence, and is perhaps the best that could be selected for illustrating it. The seeds are ripe by the end of June. They consist almost entirely of very hard greyish albumen, the embryo being very minute; the cells of the albumen are remarkable on account of the thickness of their walls, which are furnished with large pores. The starch of the colchicum corm is also worthy of microscopical examination, the granules being mostly compound.

Colchicum is supposed to derive its name from Colchis in Asia, a district famed for the number of poisonous plants, and in which the plant was first used as a medicine. The name meadow saffron undoubtedly arose from the likeness of the flower to that of the true saffron.

The saffron crocus (*Crocus sativus*, L.) also flowers at this time of year, and not in early spring like the common crocuses of the garden. The leaves also do not appear until after the flowers have faded. The corm is round and without a furrow, the leaves are seven or eight inches long, very much narrower than those of colchicum, being linear, and traversed by a white midrib like those of the spring crocus. Although the flower is very similar in shape and size to that of the colchicum, it is easily distinguished by having only three stamens, which are attached to the outer segments of the perianth. There is only one style, three or four inches long, which is thread-like and terminates in three wedge-shaped stigmas, which are notched at the apex. The ovary, which must be looked for quite at the base of the flower tube, is inferior; *i.e.* the tube of the perianth does not easily separate from it as in the colchicum. Although formerly cultivated at Saffron Walden* in Essex, and Hinton in Cambridgeshire, it has not been grown in England for commercial purposes for nearly a hundred years, and has not only ceased to be found† in those localities, but is apparently very rare in botanical gardens, for we have not noticed it in either those of Kew, Regent's Park, or Chelsea. This is perhaps owing to the fact that the flowers, even though artificially fertilized, hardly ever produce seed, a circumstance which has been accounted for by supposing the plant to be a hybrid, or which may be due to long years of cultivation destroying its tendency to ripen seed. Although in scarce seasons much adulterated with the stamens and sometimes with a coloured mixture of honey and chalk, we have never seen either shreds of beef, safflower, or marigold petals mixed with it; occa-

* The device of the seal of the corporation of this town is a curious play upon the name, it consisting of three saffron flowers *walled in*.

† It is stated by Chapellier to be unknown in a truly wild state.

sionally, however, fragments of the perianth may be seen, but probably these have only been accidentally mixed with it; the stamens are undoubtedly the most frequent admixture. These as well as all other adulterations are easily detected by throwing a little of the saffron into cold water, when anything that differs in character from the tripartite stigma will easily be recognized.

In the Regent's Park Botanical Gardens the *Actæa racemosa* is now in full blossom. This plant has already been alluded to in the month of May. The scammony and tobacco plants are also in full flower, and the mango and Malay apple have both ripened fruits this year. At Kew there is nothing fresh except the Papaw tree (*Carica Papaya*, L.) in bud in the economic house. The juice of this plant is used in the Mauritius as a remedy for round and thread worms, and has the advantage of not possessing a nauseous taste. A decoction of the seeds or roots is said to answer the same purpose; a decoction of the root has also been used for hœmaturia and certain kidney diseases. The plant is stated to possess the curious property of rendering recently killed meat tender in a short time. For this purpose the meat is simply suspended to the plant for a few hours, according to Bouton, the author of '*Plantes Médicinales de Maurice*.'

Plantago Psyllium, a small kind of plantain, the seeds of which were formerly used as a remedy for dysentery, may now be observed in blossom in the open ground, both here and at the Chelsea gardens. The seeds are just the size and colour of a flea, and hence were called flea seed; their shape is exactly that of a boat in miniature. The seeds of a nearly allied species, *P. Ispaghula*, or Spogel seeds, are still official in the Indian Pharmacopœia for use in catarrhal and renal affections. The seeds themselves answer better for dysentery and diarrhœa than the decoction, since they possess the advantage of developing a quantity of mucilage by the time that they reach the lower intestines. Several rare British plants are now in blossom in the herbaceous ground at Kew, and will delight the eyes of those botanists who have not yet seen them and who have the opportunity of visiting these magnificent gardens. Among these may be mentioned *Linosyris vulgaris; Artemisia campestris;* and *Urtica pilulifera*. It would be a great boon to those who visit these gardens for the purpose of study if the British plants were placed by themselves instead of being so mixed with numberless foreign species that it is almost impossible in the short space of an afternoon to find out what plants of our native flora are in blossom. This plan has been adopted with regard to medicinal plants which may be found in front of the No. 2 museum. These gardens afford an opportunity for amateurs to become acquainted with our rarer species, and an arrangement of the kind alluded to would doubtless so familiarize beginners with the appearance of species that it would to a great extent prevent the recklessly lavish gathering of rarities which too often takes place when they are found for the first time by a young botanist.

A few American medicinal plants are also to be seen in blossom, of which we may notice *Liatris spicata*, a composite plant used in nephritic complaints and said to be used in the Southern States for snake bites, whence its name of button snakeroot. *Eupatorium purpureum*, the American "Queen of the Meadow," is also useful in urinary diseases, the root being known as gravel root. It is a tall handsome plant about seven feet high with flowers very like those of the hemp agrimony (*Eupatorium cannabinum*, L.), so common by damp waysides in this country, but it has whorls of three to six ovate leaves. *Xanthium spinosum* is now in fruit and is worthy of examination on account of its structure, which has already been explained in this Journal. The singular Compass plant, *Silphium laciniatum*, may be found among the Compositæ, and is now in full flower. The leaves of this plant are said by Dr. Asa Gray to present their faces uniformly north and south, whence its name. Certainly, most of the flower-heads and some of the leaves were directed towards the north in the plant at Kew when visited by us, but some of the leaves were spreading in various directions. It is a tall plant about six feet high with large deeply bipinnatifid leaves; the flower-heads are large and yellow, and somewhat resemble those of the sunflower.

At the Edinburgh Botanical Gardens the medicinal plants in flower, according to the list kindly furnished by Professor Balfour, include *Aconitum paniculatum; Argemone mexicana; Sinapis nigra; Opoponax Chironium; Fœniculum vulgare; Cuminum Cyminum; Anthemis nobilis; Erythroxylon Coca; Exogonium purga; Datura Stramonium; Nicotiana Tabacum; Anchusa tinctoria; Lavandula vera; Veratrum album; Dorstenia Contrayerva* and *Hyssopus officinalis*. With the exception of the alkanet and cummin all these have already been described. In the Glasnevin Gardens at Dublin, the list, kindly supplied by Dr. Moore, is a short one, and includes *Maranta arundinacea, Dorstenia contrayerva*, and *Cephaelis ipecacuanha*.

The medicinal plants figured this month in Bentley and Trimen's now well-known work, are as follows:—*Cæsalpinia Bonducella*, the seeds of which, known as bonduc seeds or grey nicker nuts, are official in the Indian Pharmacopœia; no recent or easily accessible figure of this plant exists. *Hydrocotyla asiatica*, another official Indian plant, which is used in leprosy; *Ferula Scorodosma*, which is the *Scorodosma fœtidum* (Bunge) of 'Pharmacographia,' and one of the plants yielding assafœtida. The authors consider that the calyx rim and entire petals are not sufficient characters to separate it from the genus Ferula, and observe that although Bentham states that vittæ are present in the fruits, that they are not able to discover them. This plant has only been figured previously by Borczow. *Rheum palmatum*, var. *Tanguticum*, drawn from a specimen gathered by Prejevalsky in Tangut, which is now in the British Museum; *Peumus Boldus*, the Boldo plant; *Euphorbia resinifera*, drawn from a plant which flowered at Kew; and *Elettaria Cardamomum*.

In the drug market we have noticed mafura seed (*Trichilia emetica*, Vahl.), a seed having a general resemblance to that of the croton oil plant, but rather smaller and more cylindrical. It yields an oil which is used by the natives of tropical Africa in cookery, and also a kind of tallow. The seeds are made by the Arabs into an ointment with sesame oil, and used as a remedy for the itch. The reddish, wrinkled, oblong pods of *Acacia concinna* have been met with. These contain a saponaceous principle and are used in India like soap berries, for washing the head. Shea or galam butter, a very pure fat obtained from the seeds of *Bassia Parkii*, and mentioned by Mungo Park in his travels, does not seem to have met with so ready a sale as its qualities deserve. When pure it has a white colour and a sweet taste, and keeps well. Sassafras bark which is much more aromatic than the wood, and is used in the United States in preference to the wood or root; hog tragacanth, in considerable quantity, better known to students of pharmacy under the name of Caramania gum; and Java galangal root, distinguished from the true kind by its large size and white colour internally, have also been offered. Another drug of unusual occurrence is "red seed from Antigua" (*Abrus precatorius*) used in India for necklaces, and as a standard of weight. In fact the weight of the Koh-i-noor diamond was ascertained by this standard. The seeds weigh, with tolerable uniformity, about two grains. A dark red wood, imported under the name of dragon's wood, we have not been able to identify.

The medical journals present but few novelties in the matter of drugs and their uses. The wood of the tupelo tree (*Nyssa villosa*, Mich.) has been recommended instead of sponge for making tents; the action of the alkaloid of pao pereira bark (*Geissospermum lœve*, Baill.) has been investigated, and found to paralyse all voluntary motion (the bark has long been used as a febrifuge and antiperiodic in Brazil); the use of chloride of calcium* in atrophy of infants, especially when arising from tuberculosis, has been revived by Dr. R. Bell, of Glasgow; coffee has been found to have antidotal powers against strychnia, and the inhalation vapour of nitrite of amyl has been successfully used in a case which nearly proved fatal from the use of chloroform. It has also been shown that linseed, almond, or mustard meal has the peculiar property of removing disagreeable odours from the hands.

The dearth of scientific news continues, and beyond what has been reported from week to week in this Journal, but few events of the past month are of an interest meriting special notice. Of course the journals of the various societies and those representing the several sciences are as full as ever, and this is not strange, for they must be published, and sufficient matter must always be obtained somehow or the other. Chemists have not nearly exhausted the number of substances which admit of bromination, or the substitution of hydroxyl, and there yet remain positions,—para-, meta- and ortho-,—to be taken and retaken. The discussion of Ladenburg's benzene formula (the prism), and of Kekulé's hexagon, yet occupies other chemists, and for many a day to come will the van't Hoffs of chemical science write and discourse on the vexed questions.

In other directions of science, opportunities yet remain; there are yet a few crystals left containing fluid cavities, and Professor Mallet describes one of them, in the *Journal of the Chemical Society* (August). Even more bismuth compounds exist than have been yet subjected to investigation, and pyrology will furnish matter for more essays than one. The public analysts also have not completed their function in the history of the nineteenth century; there still remain samples of arsenical treacle, starchy mustards, coppered peas, and highly aqueous milks; even new industries are started for their especial benefit, and butterine affords no mean scope for the scientific imagination, as Professor Tyndall has been pleased to qualify this power. In a sense, therefore, science is progressing. The origin of life and the germ theory of disease; the glycogenetic function of the liver and glycosuria; the place of salicylic acid in the order of nature; the theory of chemistry; the science of temperance; the pollution of rivers, and that bogy, sanitation, are subjects which will not be settled in our day. The greatest minds are attracted by them; the experimental and enterprising faculties of the lofty among the thoughtful are centred upon them, so there can be no doubt we are progressing. In spite of all this, however, there is a stagnation in scientific quarters, and not till November is ushered in by its fogs, will the lamps of science once more glow brilliantly, and the radiometer enliven Burlington House.

It is almost painful to come down from these heights to the facts of this mundane world, but it is imperative, and in chronicling the few points of interest presented by the experiences of the month, we will begin with the one which has impressed us in the greatest degree.

At a recent meeting of the Commisioners of Sewers, various plans were brought forward and discussed, relative to the destruction of the large quantity of diseased meat which is seized by the city inspectors. During August, no less than 50 tons were so seized, and the Sanitary Committee appears to experience some difficulty in its disposal. Dr. Saunders (the Medical Officer of Health) gave the meeting an account of experiments he had been making for some time, which had resulted in the discovery of a mixed fluid, powerful as a deodorizer, and which also turns the meat black and offensive to the taste. This fluid, of which it was stated 300 gallons could be produced for 17*s*., consists of a mixture of chloride of calcium, picric acid and sulphate of iron. Chemists might vainly imagine that these fluids in mixture would result in the precipitation of sulphate of calcium, but a city paper containing a full account of Dr. Saunders' plan, tells us that the use of calcium chloride is to form an insoluble albuminate of lime! Why such an unreasonable mixture should be proposed is not evident, beyond that it was proposed by a medical officer of health. A chemist could not have made such a mistake. If an antiseptic and disinfectant treatment is to be adopted, there are preparations known which are fully powerful to effect the object; but we should rather suggest a treatment which a critic once said certain Italian poets deserved, viz., having millstones hung round their necks, and being cast into the middle of the sea. Or the meat should be burned in a kiln; the law of nature's compensation provides for the return of the carbonic anhydride and water to the growing plants. Or could not a contract be established between the City Authorities and the Zoological Gardens?

Speaking of public analysts we are reminded of the report recently submitted to the District Board of St. Saviour's, Southwark, by Dr. A. J. Bernays. We do not propose to consider this report in detail nor to make any calculations of the relations between 105 analyses, and the number of shops or the articles sold in them, in St. Saviour's, Southwark; we merely propose to characterize one point in this report. Our readers know that quite recently it has been demonstrated to the full, that the traces of copper

* The necessity for keeping abreast of the novelties used by medical men is shown by the complaint in a recent medical journal that a chemist put chlorinated lime instead of chloride of calcium into a mixture in which the latter had been ordered.

present in preserved peas are innocuous to health, inasmuch as they pass through the alimentary canal, and out with the fæces without being absorbed. Yet in spite of this, and with a prejudice too common among such persons in the present day, Dr. Bernays speaks of these copper coloured peas as very dangerous to health. It is possible that he may not keep himself acquainted with the research of the times, but if that be so it is still a fault in a public analyst; if Dr. Bernays be acquainted with the research in question, then he is actuated by prejudice.

Salicylic acid appears to be coming down from the high position where it has been placed by medical men. According to recent papers* in the medical journals of England and America, the internal use of salicylic acid results in a detrimental action on the bones, and in consequence the urine is loaded with lime salts. Several instances of necrosis of the tibia have been assigned to the use of salicylic acid, and it appears that salicylate of sodium has a similar injurious effect. The confirmation of these facts should lead to the extirpation of salicylic acid from therapeutics. Dentists also state that the use of salicylic acid injures the teeth, and in such case it cannot be a safe agent for preserving meat, milk, and beer. The "most exhaustive experiments" which have been made relative to the use of salicylic acid by brewers are not therefore absolutely exhaustive, and before they can merit this title, the question of its influence on health must be better established.

At a recent meeting of the Romford Board of Health, the tender of Mr. Dietz to alter the public lamps according to his patent for burning petroleum oil in the place of coal gas was accepted, as was also a further tender for oil. In substituting oil burning for coal burning, Romford is imitating the town of Winchester where the thoroughfares are lighted by means of petroleum.

English chemists will deeply regret to learn of the unhappy death of A. Oppenheim, so well known for his researches in organic chemistry. He and his wife had been staying at Hastings for the benefit of her health, but she died while there. He then locked himself in the room and poisoned himself with prussic acid.

Mr. Sergius Kern has communicated some further experiments with the supposed new metal davyum to the *Chemical News*.† He finds that the platinum ores contain not more than 0·035 to 0·045 per cent. of davyum, the atomic weight of which appears from some preliminary experiments of Engineer Alexejeff to be nearer 154 than 100 as originally supposed. No spectroscopic characters are, however, yet forthcoming; this is unfortunate, because if the metal be a new one, these would greatly aid in substantiating the fact. Davyum chloride is said to furnish with potassium hydrate a hydrated oxide of the metal soluble in nitric acid. Mr. Kern also describes a crystalline double cyanide of davyum and potassium; a sulphide, and a crystalline sulphocyanide. The double chloride of davyum and sodium is nearly insoluble in water and alcohol, and this is represented as establishing an important difference between it and the corresponding salts of the platinum group of metals.

One of the most interesting discoveries effected of late is that of the presence of oxygen in the sun.* The substances which have hitherto been detected in the sun have revealed themselves by the black bands or absorption lines in the spectrum. By comparing the violet end of the solar spectrum with the bright spectrum of oxygen, Professor H. Draper has been able to indicate several remarkable coincidences. Mr. Hennessy had previously observed certain bright lines in the solar spectrum, but Professor Draper was the first to give an explanation. One of these lines appears to be coincident with one of nitrogen, and three others with those of oxygen. The great difficulty is to determine whether these are really lines in the solar spectrum, or merely intervals between dark lines, and the difficulty is rendered greater by the great battery power required to obtain sufficient brightness in the spectra; still there seems to be little doubt that oxygen exists in the sun, and Professor Draper believes that all the other non-metals will be subsequently discovered there also.

Mr. H. M. Stanley has solved an important problem in African geography. He has traced the river Lualaba from Nyangwe to where it discharges into the Atlantic Ocean, thereby proving that the lake district, previously explored by Livingstone and Cameron, drains into the Congo or Zaire. The latter river drains an area of 1,400,000 square miles and is surpassed only by the largest rivers of America.

Mallet has found† that when aluminum is heated to very high temperatures with carbonate of sodium a metallic carbide is not formed, but a yellow substance which proved on investigation to be a nitride of the metal. By exposure to moist air the substance gradually disintegrates, yielding alumina while ammonia is slowly evolved. The nitride is also decomposed by acids and alkalies. Its percentage composition was found to be

Aluminum	66·16
Nitrogen	33·84

from which the formula Al_2N_3 results.

In the September number of the *Philosophical Magazine*, Mr. M. M. P. Muir gives the second part of a hypothetical paper on chemical classification. At the onset he reviews the grounds of the two creeds, (*a*) that elements have a fixed and invariable valency; (*b*) that they have a variable valency; and of course comes to no conclusion beyond the known fact. In certain compounds the valency is one quantity; in other compounds it differs. The very existence of unsaturated compounds forbids a further conclusion. Then he goes on to show what is also well known, viz., that chemical composition has something to do with boiling points, latent heat, specific gravity, refractive indices, coefficients of diffusion, specific volumes, physiological action, etc. One may as well generalize and state at once that between all known properties of matter and matter itself there is of necessity some definite connection. Mr. Muir's paper goes no further. Afterwards, structure and constitutional formulæ are discussed but with no fresh conclusions and no new light. We may conclude that the structure of acetic acid is $CH_3CO\,OH$, or that glycocine is $C_2H_3NH_2O_2$. In the latter case glycocine is viewed as amido-acetic acid, but beyond preparing it from dibrom-acetic acid by alcoholic ammonia it can be made direct from cyanogen and hydriodic acid, and while the above formula may

* *Canadian Pharm. Journal*, August, 1877, and *Journal of Materia Medica*, August, 1877.
† September 14, 1877.

* *Amer. Journ.*, August, 1877.
† *Ann. der Chemie*, 1877, clxxxvi.

express in some measure one way in which the compound may split up, it fails to convey an expression of the more direct method of formation. The chemical constitution of a body, whatever it may mean, is something equally related to the substances from which it is elaborated, and to those other secondary ones generally simultaneously produced; it also bears the same relation to bodies influenced by its reactions. Given a chemical mass, we have every right for thinking that it may be decomposed in any conceivable way, so long as the sum of its products is equal to the original mass; and there chemical theory begins and ends, and hence also any chemical equation is but a partial representation of the truth.

MUSHROOM KETCHUP.

A notice of the mushroom would hardly be complete unless it contained some reference to ketchup, one of the most popular economic products of the fungus tribe. Ketchup, or catsup, as some prefer to spell it, is by no means exclusively made from *A. campestris.* Not only is the Horse Mushroom (*Agaricus arvensis*), to which we shall shortly refer, largely used in its manufacture, but it is stated that almost any species with dark juice is indiscriminately employed. Ketchup made from the Morel (*Morchella esculenta*) is said to be especially delicious. Mr. Cooke says there is an extensive manufacture of ketchup conducted at Luddenham, near Market Harborough, but the great difficulty appears to be the prevention of decomposition. Messrs. Perkins receive tons of mushrooms from every part of the kingdom, and they find, even in the same species, an immense difference in the quality and quantity of the produce. The price of mushrooms varies greatly with the season, ranging from a penny to sixpence a pound. Messrs. Perkins are very careful in their selection, but little discrimination is used by manufacturers on a small scale, who use many doubtful species.

The derivation and meaning of the word "ketchup" are unknown, unless we accept Webster's statement that it is probably of East Indian origin, because it meant in the first place a kind of East Indian pickle. A real or supposed Japanese word, "kit-jap," has been thought to throw some light on it; but, in spite of Swift's enumeration of "catsup" as a foreign condiment, it does not appear to be known out of England except as an English export. If, however, "kit-jap" is an Eastern name for soy sauce, as has been stated, it is not difficult to see that it might have been transferred to our English condiment.

The making of ketchup, like most matters connected with the culinary art, is a work requiring some skill and experience. We offer the following instructions on the point, which we borrow from Mrs. Hussey's beautiful 'Illustrations of British Mycology':—

"All kinds of agaric of which it is proposed to make use should be sound. Decaying larva-eaten flaps are ignorantly preferred; but if the flavour be stronger, it is of a coarse, rank strength, and the smell soon becomes disagreeable—in fact, there is a tendency to putrescence in such agarics. Cut off the stems, for they possess no flavour, and afford little juice, but much dirt; if the caps are soiled, peel them, do not cut, but break them small, powder every portion with salt, and set the mass in an earthen colander, placed in a bowl. The precise quantity of salt is not of importance, excess is better than defect, it being only needful in cookery to remember that salt is not to be used when ketchup is. After twenty-four hours press the pulp gently down in the colander, all the liquor that thus runs off is to be preserved, and no more, for if you choose to squeeze the rest of the moisture out, although it may be used for any immediate purpose, it is not worth saving. It is a usual complaint that there is so much feculence to get rid of in ketchup; this is owing to the mass of salted pulp being left too long before it is strained, so that the very flesh of the agaric is melted down into the liquid, instead of its consisting merely of juices extracted from the solid parts. By this maceration there is a gain in bulk; but it is a deceptive gain as to value; the feculence is flavorless, causing fermentation, and pouring off and rebottling is injurious; it is much better to avoid the ketchup ever containing this sediment. The liquor extracted as above, will be a pure fragrant delicious ketchup. Many people would boil this till the aroma had disappeared, under an erroneous notion of 'making it fit to keep,' but to this end the boiling by no means conduces, and almost all agarics lose their 'bouquet' by the continued action of heat. But how then shall we keep the ketchup? A great deal better! *Probatum est.* And now to divulge the secret. Before the ketchup season comes, procure a quart of spirits of wine in a glass-stoppered bottle, put into this any spices you prefer, in sufficient quantity to flavour the spirit strongly. After the ketchup has been strained off, let it settle twelve hours, then put it in half-pint bottles, fill them up to the shoulder, add the spiced spirit to fill the neck, and cork the bottles tightly and steadily; they must not afterwards be shaken, because the spirit should be left floating at the top to exclude the air, and prevent the formation of that other incipient fungus which cooks call 'mother.' When to be used shake the bottle thoroughly, and put as much of the contents as you like into the waiting soup or gravy; it should not be boiled up in it. The small quantity of spirit is unappreciable in the bulk of ketchup, not affecting the flavour at all. All who try this plan fairly will acknowledge they never tasted ketchup before."

We must apologize both to Mrs. Hussey and our readers for this lengthy extract; but we believe that many of our lady readers will be glad to have a recipe for ketchup making, which is recommended from experience by so excellent an authority. Anyone who has ever tasted ketchup will acknowledge that—judging from results—there must be "more ways than one" of making it; and if that which we have given is only half as good as Mrs. Hussey's concluding observations would lead us to suppose, none of our readers will regret having tried it.—*Britten's "Popular British Fungi."*

ANALYSIS OF COTTON ROOT BARK.*

BY CHARLES C. DRUEDING, PH.G.

From an Inaugural Essay.

The analysis was partly made at the laboratory of the Philadelphia College of Pharmacy, and after a series of preliminary experiments the following course was adopted:—

Five pounds of the bark were exhausted with strong alcohol. About twenty-four pints of a beautiful dark red coloured tincture was obtained, which was reduced by distillation to sixteen pints, and precipitated with an alcoholic solution of acetate of lead (nearly ℥viii, dissolved in about Oiiss alcohol, were required for this purpose), leaving a light straw-coloured filtrate B.

The precipitate was diffused in about eight pints of alcohol, and sulphuretted hydrogen passed through it until completely decomposed. The filtrate from the lead sulphide and washings were of a very dark red colour; distilled to recover the alcohol, and evaporated, a *resinous* colouring principle was left, which yielded a dark brown-red powder, resembling powdered cochineal, wholly solu-

* From *The American Journal of Pharmacy*, August, 1877.

ble in alcohol, ether, and aqueous solutions of ammonia, soda and potassa, and precipitated from the three latter by an acid. With potassium hydrate it strikes a green colour; petroleum benzin seemed to dissolve only a portion of it. The resin was therefore treated with hot benzin; about twelve pints of a light yellow coloured solution was obtained which, on cooling, deposited a small quantity of a peculiar *yellow substance*, giving the same chemical reactions as the resin. I was unable, however, to obtain a sufficiently large quantity of it to thoroughly investigate it; the benzin solution, on being evaporated to one-half its bulk, did not deposit on cooling, as was expected, but remained clear. The evaporation was then continued until all the benzin was driven off; the result was about one ounce of a blackish, greasy, semi-fluid substance, which proved to be *fat*, mixed with colouring matter, and on being boiled with caustic potassa formed soap.

The filtrate and washings B were reduced by distillation to about ten pints, and freed from excess of lead by sulphuretted hydrogen and filtration. The sulphide of lead obtained was dried and marked C.

The filtrate was distilled to recover the alcohol, and evaporated to drive off as much as possible of the acetic acid, until about three or four ounces remained. This was mixed with six ounces of water, thrown on a moist filter, and the precipitate washed. The filtrate and washings D were of a brownish red colour, and a sweetish bitter taste; the precipitate E was dark greenish, semi-fluid and greasy.

D was precipitated with subacetate of lead, and the precipitate F washed with water. The filtrate was marked G. F was diffused in water, decomposed with sulphuretted hydrogen, and the filtrate evaporated; a dark mass was left, having a somewhat peculiar bitter and astringent taste. It was tested for tannin, and found to give a green colour with sesquichloride of iron and also produced a precipitate with solution of gelatin.

G was freed from lead by means of sulphuretted hydrogen and filtration; the resulting liquid, about two pints, was of a light yellow colour; it was evaporated on a water-bath to a semi-fluid consistence. Two ounces of a red coloured thick syrupy liquid was the result, having a sweet taste. Trommer's test gave an abundant red precipitate, proving the presence of *glucose*.

E was separated from the water, and washed with petroleum benzin until it ceased to pass through coloured; about two pints of the benzin solution were obtained, having a dark colour, yielding, after evaporation, about one ounce of *fixed oil* mixed with some *colouring matter*, and forming soap on being boiled with caustic alkalies. The portion left on the filter undissolved by the benzin was of a greenish-yellow colour and hard enough to be powdered; it was soluble in alcohol and found to be *chlorophyll*.

The sulphide of lead C was treated with hot alcohol, but besides a little sulphur, nothing was dissolved.

A portion of the dregs left after exhaustion with alcohol was dried, macerated with water for twenty-four hours, and expressed. The expressed liquid was mucilaginous and almost tasteless; evaporated to a syrupy consistence and mixed with an equal bulk of alcohol, an abundant precipitate of *gum* and an almost tasteless solution were obtained.

Five grams of the air-dry bark were ignited in a porcelain crucible; the ashes weighed 0·3 gram, or 6 per cent., and contained potassium, sodium, calcium, magnesium, iron, sulphuric and phosphoric acids.

The organic constituents of cotton root bark are a red and a yellow resinous colouring matter, fixed oil, gum, sugar, tannin and chlorophyll.

THE PHARMACOLOGICAL GROUP OF ATROPINE.*

BY R. BUCHHEIM.

As atropine, when treated with baryta water, decomposes into tropic acid, $C_9H_{10}O_3$, and tropine, $C_8H_{15}NO$, it may be viewed as tropine in which the only replaceable atom of hydrogen is replaced by the radicle of tropic acid, thus: $C_8H_{14}O.N.C_9H_9O_2$. In crude atropine a second base exists of the formula $C_{18}H_{25}NO_4$, called by Hübschmann *belladonnine*. The author obtained a quantity of crude belladonnine, prepared by precipitating atropine sulphate with potassium carbonate till the precipitate was no longer resinous, but a powder. From this syrupy dark-brown mass the belladonnine was precipitated by ammonia, well washed with water to remove brown colouring matter, and one-half was neutralized with sulphuric acid and added to the rest. From this mixture ether, or better, chloroform extracted pure belladonnine, leaving atropine and some belladonnine as sulphate. One-half of this residue was thrown down with ammonia, then added to the other half, and shaken with ether. The aqueous residue, on addition of ammonia, gave first a precipitate of belladonnine and then of atropine. The belladonnine, separated from its solution in ether, was dried; it was a yellowish-brown resin, almost insoluble in water, easily soluble in alcohol and in chloroform, and somewhat less in ether. It forms neutral salts with acids, the sulphate being a resin.

With alcoholic potash it decomposed into tropine and a resinous body, named by the author *belladonnic acid*, which differs in its properties from tropic acid. Belladonnine may therefore be regarded as a compound of this acid with tropine.

Tropine, obtained by distilling the residues from which the belladonnine had been separated with lime, is a liquid of the consistence of castor-oil, but after some time becomes crystalline. It is easily soluble in water and in alcohol, has a smell resembling that of tobacco, and a strong alkaline reaction. Its sulphate is easily soluble.

Benzoyl-tropine, prepared by adding benzoyl chloride to tropine, closely resembles atropine, which is tropyl-tropine.

Physiological experiments with these bodies showed that tropine has no action on the pupil, unless an atom of hydrogen is replaced by an acid radicle, but that this action depends on the nature of the radicle. Atropine possesses it more strongly than belladonnine or benzoyl-tropine. The exhibitory action also on the heart is recognizable in tropine, but to a less degree than when the hydrogen is replaced.

It is probable, from Geiger and Hesse's experiments, that the alkaloid obtained from the seed of the datura, called by them *daturine*, is a substituted tropine, the acid probably being an isomeride of tropic acid.

The same chemists isolated an alkaloid from henbane, and named it hyoscyamine, which, according to Höhn and Reichardt's experiments, is decomposed by baryta-water into hyoscinic acid, $C_9H_{10}O_3$, and hyoscine, $C_6H_{13}N$; the two formulæ when added together amount to that of hyoscyamine, $C_{15}H_{23}NO_3$. Either, then, the formula of the acid or of hyoscine, or of the alkaloid must be incorrect, as no water is evolved. The action of hyoscyamine is similar to that of atropine. Two samples of hyoscyamine were obtained by the author; one was crystallized, and acted physiologically as stated by Hellmann; the other was a syrup, and produced a reflex action of the nerves, which was not observable with the crystallized alkaloid; the probability is, therefore, that a second alkaloid was present. For this hypothetical substance, the author suggests the name *sikeranine*, from Sikerân, the Persian name of hyoscyamus.

* *N. Rep. Pharm.*, xxv, 344–358. From the *Journal of the Chemical Society*, August, 1877.

The Pharmaceutical Journal.

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"THE SCIENCE OF TEMPERANCE."

"THE Science of Temperance" was the subject of a lecture delivered by Dr. B. W. RICHARDSON, F.R.S., in the Ancient Concert Rooms, Dublin, on the evening of the 13th inst.

There are propably but few persons who are not acquainted with Dr. RICHARDSON'S views regarding the action of alcohol on the vital functions, and we venture to add there are probably also but few really scientific people who endorse them. This is by no means a bold statement; the audiences which assemble to hear the energetic eloquence of Dr. RICHARDSON are made up of Good Templars, and other quixotic creatures, who have no real knowledge to oppose against the gushing and crushing vehemence of their apostle; they therefore accept his teachings *en bloc* and with one united voice they take up their war cry, "All ye that thirst, come ye "to the waters."

It is oft-times a matter of consolation and congratulation to human nature, that it inherits certain instincts, or certain predispositions; and although churches may unite their efforts to prevent their practical realization or to obviate their results, and although the Dr. RICHARDSONS may work upon the popular ignorance and the love of the sensational element presented by the human mass, these efforts will never fructify; for nature has imbued in man the love of wine, and he will drink wine while he may.

Dr. RICHARDSON tells the public that alcohol cannot be considered as a food; on the other hand a greater than Dr. RICHARDSON has said that it is a food. "In a certain household," says LIEBIG, "it was "observed that from the day on which the servants "ceased to receive beer from their master, the con- "sumption of bread increased in a ratio correspond- "ing to the diminution of beer; so that the beer "was paid for twice, once in money, and the second "time in the form of an equivalent of another kind "of food yielding the same amount of carbon and "hydrogen."

The public may choose between these quoted authorities. We prefer the doctrines of LIEBIG; doctrines which have not received any measure of disproof.

Dr. RICHARDSON also says that common alcohol was not intended as a special gift any more than the other chemical bodies also termed alcohols. This statement presupposes an acquaintance on the part of Dr. RICHARDSON with the designs of Providence; how does he know alcohol was not intended as a special gift? Christians who have ever seen a vineyard or a hop-field, or who have read of the miracle of the transformation of water into wine, would scarcely agree with Dr. RICHARDSON; but even should they do so, it is easy to show how utterly sensational and false are his doctrines. We distinctly aver that humanity gives no special preference to ethylic alcohol above all other alcohols, for ordinary sugar is a chemical body and an alcohol, and all the world uses sugar, and all the world does not use ethylic alcohol, or at least not so much as it would like to use, because it is more costly than sugar. Dr. RICHARDSON, moreover, told his audience on the 13th inst., that physiologists and biologists could perceive no provision in the animal economy for the use of any fluid other than water. Ordinarily the animal economy gets more than a just measure of this essential fluid, even when it imagines it is taking alcohol; but more seriously we may say that if Dr. RICHARDSON'S view were correct, tea, coffee, and chocolate must be also eschewed. But the fact is that physiologists and biologists who know their science do perceive such a provision, and that provision consists in the power of oxidation which exists in the blood, and which is sustained by respiration, whereby alcohol is burnt up into carbonic acid and water with the evolution of animal heat, and animal heat is as important a factor in healthy life as a supply of flesh-forming food.

Dr. RICHARDSON then went on to say that ethylic alcohol acts on the body like other chemical substances and produces phenomenal effects. No doubt. Ginger, and bread and butter, and capon are also chemical substances, and these foods may also produce phenomenal effects. So wrong again, Dr. RICHARDSON.

The truth is, Dr. RICHARDSON talks to his audiences as if he were actuated by the gratuitous assumption that "all men are drunkards." Now this is not the case. There is the vast majority of the public which uses alcohol in the form of beer or wine, or both, as a food, and as a very enjoyable one too; it is a small minority which consists of drunkards, and there is no reason in the world why Dr. RICHARDSON should not waste his life upon these creatures if he deems it worth his while. But even then, public opinion should not be directed against vices always with us, by fits and starts, and by using sentimental and unscientific arguments; but it should be directed against them "uniformly, steadily, and "temperately;" "there should be one weight and "one measure."

Scientific men know well enough what is the action of alcohol in the system, so far as it has been determined, and Dr. RICHARDSON can hardly hope to run on in his wild freaks and receive no check from facts or those who know them. They are these. Alcohol taken in reasonable amount and by ordinarily healthy persons is entirely burnt up in the blood into carbonic acid and water, and with the simultaneous production of comfortable sensations. When larger quantities are taken a certain influence is exerted upon the nerves of the stomach which is prejudicial to digestion while it lasts. When yet larger quantities are consumed, traces of the alcohol are eliminated in the breath and urine, but still the mass is oxidized in the blood, although by its excessive amount its presence interferes with the proper functions of the body. Taken in madly large quantities, alcohol appears to exert a peculiarly chemical action upon the brain, which interferes with its functions and produces delirium-tremens.

A man may bring about worse things than delirium tremens by eating more nightingales or lampreys, or even bread and butter than the body can conveniently accommodate.

We, therefore, charge our glass (metaphorically) once more and drink to the non-success of Dr. RICHARDSON's sensational teachings and the annihilation of his more unscientific doctrines.

THE YORKSHIRE COLLEGE.

THIS Institution has recently issued its calendar from which it appears that two new subjects have been added for the fourth session about to commence; these are classical literature and history, and modern literature and history. This arrangement which has ensued upon the fusion of the work of the Leeds University Extension Committee with the College, is one which cannot fail to increase the useful purpose and noble function exercised by the College, although only a "three-year old." Science will lose nothing in its efficiency of treatment by this alteration, and indeed would seem to gain also through the fusion above adverted to, for a very extended system of outside lecturing is announced for the coming session. This arrangement which has been made with the GILCHRIST Trustees, through their Secretary, Professor W. B. CARPENTER, F.R.S., will consist of "Science Lectures for the People," to be delivered by the college professors in Leeds, Bradford, Halifax, and Keighley.

It is also stated that the Drapers' Company has made a grant with the object of enabling the College to provide practical instruction in coal-mining, a subject of great importance, more particularly for Yorkshire and the adjoining counties.

The Calendar of the College is full of useful information for intending students, and embraces the prospectus of the Leeds School of Medicine.

POISONOUS FUNGI.

A FEW days since some children rambling in Stanley Park, near Everton, came upon some fungi which they gathered and ate. A short time afterwards one of the children was taken ill, and appeared to be in a fit; the other children being soon in the same state. They were taken to a surgeon's in the neighbourhood, who administered emetics and applied the stomach pump. It was not until after some two or three hours' exertion that the children had so far recovered as to admit of their removal to their homes, and they continued to suffer from the effects of the poison for some time. This is the fifth case of poisoning by fungi that has occurred in the neighbourhood of Everton during the past week.

INFLUENCE OF THE BAMBOO IN PRODUCING FEVER.

WE have lately had occasion to refer to two extraordinary trees—the Wauga and the Rain tree—noticed in recent reports of the British Consul at Hayti, and a Consul of the Columbian Government in Northern Peru. From the report of Major PEYTON, one of the forest officers in the Bombay Presidency, a singular statement is given in connection with the flowering of bamboo. He states that for the last ten years he has noticed, in Kanara, that wherever the bamboos flower and seed, then fever, as an invariable rule, prevails. In 1866, immediately below the Guáts, and in 1867 and 1868, towards the eastern part of the district, it was so, and more recently around Yellapur, where the bamboos flowered and seeded, fever became general, few escaping it. The type of fever that at first prevails is not unlike hay fever at home, but this is when the flowering of the bamboos first sets in, and it changes into greater severity as the seeds begin to fall and ferment. We hope to hear something further about this.

THE MANCHESTER SCHOOL OF PHARMACY.

THE above school which is in connection with the Manchester Chemists' Association, has just issued its arrangements for the session 1877—8. Mr. LOUIS SIEBOLD, F.C.S., will deliver thirty-five lectures on Chemistry (including the elements of Physics); thirty lectures on Materia Medica and Pharmacy; and twenty lectures on Analytical Chemistry. Arrangements have also been made for the delivery of a course of lectures on Botany after Christmas. The condition of attendance at these courses is, that the students must be Associates of the Manchester Chemists' Association of which Mr. F. BADEN BENGER is the Hon. Sec.

A LIVERPOOL correspondent has forwarded some beans which he says are freely sold to children in that town under the name of castor-oil nuts or pea nuts. They are the pods of *arachis hypogœa* a leguminous plant, and are commonly known as ground nuts, monkey nuts, or pea nuts. Our correspondent believes they contain an acrid substance which may be somewhat dangerous, and it is a fact that these nuts sometimes produce diarrhœa.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

(*Continued from page* 240.)

The next paper read was on—

The Chemical Constituents of Convolvulus Scammonia.

BY CHARLES T. KINGZETT, F.C.S., AND THOMAS FARRIES, F.C.S.

On what has been called the blue-list of the British Pharmaceutical Conference, Convolvuline from the roots of *Convolvulus scammonia* finds a place amidst the alkaloids of doubtful existence. It was with the view of arriving at more definite knowledge regarding this doubtful alkaloid that we commenced a research some months ago.

The roots (7 lbs. direct from Smyrna) were first of all extracted thoroughly with tolerably hot water, and after this with alcohol of 85 per cent., and finally with ether. The ether extract contained apparently only a little matter of similar nature to that extracted by the alcohol.

Treatment of water extract.—This was of a faintly acid reaction and dark colour. It was strongly acidified by nitric acid, whereby a bulky albuminous looking precipitate was thrown down, which afterwards proved mainly insoluble in water, and was not further examined. The clear filtrate was fully precipitated with phosphomolybdic acid solution, and the considerable precipitate thus obtained was washed first with dilute nitric acid, and finally with water acidified by sulphuric acid. The precipitate was then decomposed with excess of boiling baryta water, filtered from the baric-phosphomolybdate, and the excess of barium removed by carbonic anhydride; the last traces being taken out by an exact amount of sulphuric acid. The ultimate solution was alkaline in reaction, and was now neutralized by hydrochloric acid, and concentrated. The product gave no precipitate with aqueous solution of platinic chloride, but yielded a bulky one with alcoholic platinic solution, which was recrystallized from water. On analysis, it proved to be the pure double chloride of potassium and platinum. Therefore, *Convolvulus scammonia* contains no alkaloid soluble in water.

Examination of the alcoholic extract.—When concentrated, this formed a golden yellow syrup, from which water precipitated a stringy bright-yellow mass soluble in ether.

It was several times reprecipitated from alcohol by water, and it then gave both with sulphuric acid and sugar and with sulphuric acid alone, the purple reaction yielded, as Hake and one of us have shown, by most so-called glucosides and other bodies.*

A quantity of it was boiled with a two per cent. sulphuric acid solution during 20 hours, filtered, the sulphuric acid removed by baryta water, and the excess of this reagent by carbonic anhydride. The filtrate on evaporation to dryness left a glucose-looking mass containing barium in combination, and which gave the ordinary reactions of glucose; that is to say it gave with camphor and strong sulphuric acid the purple colour explained in the paper referred to above. It charred with sulphuric acid like sugar; its solution readily reduced Fehling's copper test, and also nitrate of silver. It was dried at 100° C., powdered and analysed. ·309 gram gave 0·137 gram H_2O, the carbon determination was ruined by an accident; ·4858 gram gave 0·286 gram $BaSO_4$.

These numbers give 4·92 per cent. H and 34·61 per cent. Ba.

From these percentages it will be seen that the barium stands to the hydrogen as 1 : 19·5 atoms. In a similar substance obtained by a like process from hederic acid, a corresponding barium salt was obtained when the relation of barium to hydrogen was also 1 : 19.

A barium salt of glucinic acid, having the formula $C_{12}H_{16}BaO_9$, would contain 31·06 per cent. Ba and 3·62 per cent. H; while glucosate of barium $2\,(C_6H_{11}O_6)\,Ba$ requires 27·8 per cent. Ba and 4·44 per cent. H. There can be little doubt that the substance whose analysis is given above, represents an intermediate state, occurring in the spontaneous change of glucosate into glucinate of barium. Of its relation to sugar there is no question.

A similar substance, which, however, we have not analysed, is obtained by treating the resin with strong sulphuric acid, diluting, filtering, and submitting the filtrate to the same process as that resulting from boiling the resin with dilute acid.

Again, the same substance appears to be produced in, and may be similarly extracted from the black and shining residue left in the retort when scammony resin is submitted to dry distillation.

Under these last named circumstances another product is also obtained as a distillate.

At 82° C. an oily body began to condense from the heavy vapours which formed, and between this temperature and 90° C. several grams of the distillate were obtained. It constituted a somewhat volatile liquid, of a yellowish colour, and pungent aromatic odour; its further examination and analysis is reserved for a future opportunity.

Cl. Marquart* has described the resin obtained from the root of *Convolvulus scammonia*, and believed he had separated a vegetable base, but from our observations it would appear that Marquart was in error.

Scammony resin has been described by a number of chemists, including Bouillon, Lagrange and Vogel, Planche, Johnston, Spirgatis, Mayer, Keller and Koomann.

From all accounts, scammony resin appears to differ little from jalapin. Some authors say that the resin derived from certain species of convolvulus is insoluble in ether; that which we obtained and examined was easily soluble in ether, and in this respect, therefore, resembled jalapin (from jalap stalks).

From the analyses of jalapin agreeing fairly among themselves, various formula have been constructed; that generally accepted is $C_{34}H_{56}O_{16}$, containing 56·66 per cent. C; 7·77 per cent. H, and 35·57 per cent. O.

Jalapin is stated, by various authors, to split up under the influence of dilute acids as follows:—

$$2\,C_{34}H_{56}O_{16} + 11\,H_2O = C_{32}H_{62}O_7 + 6\,C_6H_{12}O_6.$$

Jalapin + water = jalapinol + glucose, while jalapin from scammony resin is represented as splitting up in this way—

$$C_{34}H_{56}O_{16} + 5\,H_2O = C_{16}H_{30}O_3 + 3\,C_6H_{12}O_6$$

Scammony resin + water = jalapinolic acid + glucose. That scammony resin is a glucoside and yields glucose by proper treatment, is supported by the foregoing observations.

Mr. Williams asked if Mr. Kingzett had isolated the alkaloid in any way.

Mr. Kingzett said he had already stated that he had found there was no alkaloid; he got a platinum salt which proved to be a potassic combination only.

Mr. Groves said it was not a new fact that scammony contained both a resin acid and a resin glucoside.

Mr. Kingzett said that although certain kinds of jalap stalks had been examined, and a resin obtained which on boiling with dilute sulphuric acid reduced Fehling's test, he had not found any analyses of the sugar thus assumed to be produced. Chemists were too often satisfied with obtaining the reduction of Fehling's test as being sufficient to establish the presence of sugar, but he had analysed the substance itself.

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* *Pharm. Journ.*, May 12, 1876.

* *N. Br. Arch.*, vii., 248; x., 139.

Mr. Williams reminded Mr. Kingzett that Dr. Williamson about twenty years ago published a very elaborate paper on this subject.

Mr. Kingzett said he believed he was acquainted with all the literature of the subject.

Mr. Umney thought every manufacturer must have noticed the presence of glucose in scammony root. During the past eight or nine years, he had operated on many tons of the root, and always found in the alcoholic extract a large quantity of uncrystallizable grape sugar, and he remembered the late Mr. Daniel Hanbury having 3 or 4 pints of this thick treacly substance from him to see if he could crystallize it. As he understood Mr. Kingzett's process, the whole of the saccharine matter would be removed by treatment with water at 70° C. He had generally allowed the crude resin as obtained by alcohol to stand two or three days in contact with water, in which it was boiled, the saccharine solution being removed again and again.

The next paper read was on—

Further Researches on Tea Hair.

BY THOMAS GREENISH, F.C.S.

Under the name of Pekoe Flower or Flower of Tea, this substance was brought before the Conference at Glasgow last year, by Mr. Groves, and on that occasion I gave the result of its examination, mainly microscopical, which I had previously undertaken. At that time but little was known either by Mr. Groves or myself of its history, the position it occupied in commerce, or its ultimate destination. I followed up the subject with the view of supplying for this meeting that more complete information which was wanting on these several points, as the tea hair may probably crop up again as a natural curiosity for a lover of science, or to supply a sensational paragraph for a public analyst.

The tea hair was said to have emanated from a house in the city, but the city is a large place in which to look for tea hair, and I found it so. For many months I worried with my inquiries tea brokers and tea merchants, but without result, until at last a friendly hint directed me to a tea broker's office where I found a member of the firm who, in addition to a very discriminating palate as regards the strength and flavour of tea, had also acquired a vast deal of collateral information about the teas imported from India and China.

It appears that tea hair finds its way into this country as an article of legitimate commerce, at tolerably regular intervals; its commercial name is "Pekoe Flower," and sometimes the "Bloom of the Pekoe Flower." It is a product of India teas, not of those of China. It is purchased somewhat as a curiosity, but there are those who buy it pretty regularly. Pekoe flower is never sold as tea simple or for mixing with tea. It is almost a necessity that it should be sold alone. If it be mixed with ordinary tea there is such a tendency to the separation of the tea hair and its agglomeration into lumps, that any attempt of this kind would probably result in the whole being returned as an adulterated tea.

In an essay on the cultivation and manufacture of Indian teas by Lieut.-Col. Money, and published in Calcutta, the whole process of the manufacture of the Indian teas is given, and it is not difficult to trace the condition in which this tea hair is found, to its origin. One part of the process consists in what is called "rolling" the leaves, when the juice is given out freely, and as to its results on the leaf he says, "If the leaves which give Pekoe tips are separated from the other leaves and rolled *very little* and *very lightly* there will come out Pekoe tips of a whitish colour; if *not* separated from the other leaves but manufactured with them the sap from the other leaves, expressed in the rolling, stains these said leaves, which are covered with a fine silky down, and makes them look like the rest of the tea." This is evidently the part of the process in the manufacture of Indian teas which gives to the otherwise greyish-white hair its brown colour, and also that extractive matter which is found adhering to it.

Mr. Wigner, in his analysis of the tea hair, gives theine 1·5 per cent. as compared with 3·5 per cent. for Pekoe tea, and Mr. Groves remarks in reference to this, that "it is interesting to find theine present in the tea hair." I doubted the correctness of this conclusion. The hair of the leaf is an extension of the epidermal cells covered by the cuticle; there is an absence of chlorophyll, the cells being empty; this layer prevents too rapid evaporation from the parenchyma of the leaf, but plays no part in the plant's economy. I have no doubt but that the theine obtained by Mr. Wigner was derived from extractive and parenchymatous tissue adherent to the base of some of the hairs. To determine this point, I took 100 grs. of tea hair, exhausted it with cold water and evaporated the liquid to dryness. It yielded 15 grs. of extract, this closely agrees with the result obtained by Mr. Wigner. My object was now qualitative, to determine the presence of theine in the extract, and for this I adopted the micro-sublimation process. A little of the extract was dissolved in water, to which was added some calcined magnesia; the solution was boiled and evaporated to dryness; part of it was then placed in a cell on one glass slide covered by another, and at a temperature of about 120° C. I obtained successive crops of theine in acicular crystals. I then subjected the hair from which the extract had been obtained to the same process, but there was no indication in the hair freed from extractive of the presence of theine. It is evident that this experiment on the exhausted hair could not be considered conclusive as to the absence of theine in the normal hair of the tea leaf. I further picked carefully clean hairs from young Pekoe leaves, treated them in the same manner by gently boiling with a little calcined magnesia, and employed the same micro-sublimation process, but failed to get the slightest indication of the presence of theine in the hair itself when free from extractive matter and parenchymatous tissue. These experiments are to my mind conclusive that the theine was obtained from the extractive matter and parenchyma of the plant, and that there exists no theine in the normal hair of the tea leaf, and I believe that there is no known instance of a simple hair, such as that on the tea leaf, containing the active principle of the plant.

A further careful examination of the tea hair, besides calcareous matter, shows the presence of minute particles of the elytra of beetles, the markings on which bear a close resemblance to the venation of a leaf, and which may easily be mistaken for fragments of some leaf other than tea.

I may add that the tea hair has created considerable interest, and I have been applied to from the continent for museum samples, which until lately I was quite unable to supply.

Thanks having been voted to Mr. Greenish for his paper,

Mr. Groves said he could have saved Mr. Greenish a great deal of trouble if he had known that he was in search of the importers of the tea hair. It was no mystery—he had known all about it from the first. The general impression was that this tea hair was worked up into the compressed tea as the only way of getting rid of it. As to the presence of theine the presumption was in favour of Mr. Greenish's theory that it was not present.

The next paper read was on—

Copaiba Testing.

BY LOUIS SIEBOLD.

All who have been frequently engaged in the testing of copaiba will have noticed that most of the tests described in standard works on materia medica and pharmaceutical chemistry, though applicable to some kinds of copaiba, are quite untrustworthy as general tests for the purity of this oleo-resin. I will deal with these tests one by one before giving what I conceive to be a simple and thoroughly reliable mode of ascertaining the presence or absence of adulterants in any sample of this substance.

1. The specific gravity.—This like the consistence of the balsam varies considerably according to the proportions of resin and volatile oil present in the samples. Some authors give it as ·95 to ·96, others at ·94 to ·97, and others again as ·94 to 1·0. Having experimented with a large number of samples of different origin, I am in a position to state that the range of variation is much greater than is generally supposed, as I find the limits to be ·915 and ·995. Equally variable are the relative proportions of resin and oil. The smallest proportion of resin I have ever met with was 18½ per cent., whereas the usual range is from 30 to 65 per cent. Such variations are by no means surprising considering that the oleo-resin is obtained from many different species of copaifera growing in different localities and under different climatical influences, and that these circumstances, together with the age of the trees, the time and mode of extraction, and the age of the balsam itself, are sure to have a material influence on its chemical composition.

2. Appearance.—All kinds of copaiba as imported are turbid, and require to be filtered before they can be sent out to retail dealers. The colour varies as much as the consistence and specific gravity. The British Pharmacopœia states that copaiba should not be fluorescent, and this statement occurs again in the majority of books I have consulted. Flückiger and Hanbury, however, admit that it is sometimes slightly fluorescent. My own experience is that very many genuine samples of copaiba are distinctly and many others slightly fluorescent, and that very few samples indeed are quite devoid of this property.

The benzol test.—According to the B. P. copaiba should be soluble in an equal bulk of benzol. This as a test is quite useless, since all the known adulterants of copaiba are likewise soluble in benzol.

The magnesia test.—Pure copaiba is stated to be capable of dissolving one-fourth of its weight of magnesium carbonate by the aid of heat, and remain transparent; if not, an adulteration with a fixed oil or with gurjun oil is to be inferred. The test, however, is quite fallacious as it only answers with the thicker specimens of Maranham balsam. The power of copaiba to dissolve that quantity, or anything approaching that quantity, of magnesium carbonate, depends on the presence of a large amount of acid resin (copaivic acid), and unless we are prepared to condemn all samples of Para and nearly all the thinner kinds of Maranham balsam as adulterated, the test must be dismissed as useless.

The ammonia test.—One part of copaiba with two and a half or three parts of solution of ammonia is to produce a clear mixture. This test is fallacious for the same reasons as the magnesia test.

The alcohol test.—The statement met with in some books that copaiba is perfectly soluble in rectified spirit is true only with regard to certain balsams. The great majority of samples of genuine copaiba are not soluble in that menstruum. Nearly all authors, however, agree that one volume of copaiba ought to form a perfectly clear solution with three volumes of absolute alcohol. Nevertheless this statement too is incorrect, for the thinner balsams, and especially those of Para, form a cloudy mixture with absolute alcohol, which after prolonged standing deposits some white or yellowish-white resinous flakes. Yet this test, if carefully applied, is of some value, for in the presence of a fatty oil other than castor oil, the sediment just mentioned, instead of consisting entirely of resinous flakes, will contain drops of the oil. On the whole, however, I do not care very much for this test; it fails with castor oil, and is in every respect inferior to the simple process of evaporation to which I shall refer presently.

Muter's test.—The details of this process were published in the *Analyst* of November 30 last year, and reprinted in the *Pharmaceutical Journal* of December 30. They may be briefly summarized as follows: The alcoholic solutions of a weighed quantity of the balsam is saponified with an excess of caustic soda, the soap solution mixed with water, then evaporated to a given bulk, the excess of alkali neutralized with sulphuric acid, the whole evaporated to dryness and the dry residue treated with a mixture of ether and alcohol, which will dissolve the sodium copaivate, leaving undissolved the sodium sulphate and any sodium oleate, which, in the presence of a fatty oil, must have been formed. The insoluble matter is then taken up with warm water, the solution decomposed by hydrochloric acid, and the liberated oleic acid carefully collected, dried and weighed. As copaiba contains a small quantity of altered resin, the soap of which is not readily soluble in the ether alcohol, Dr. Muter makes an allowance of 6 per cent. for this resin, which must be deducted from the percentage of oil, calculated from the analysis. Another correction has to be made in consideration of the slight solubility of sodium oleate in ether alcohol, which, according to M. Barfoed amounts to 1 in 1000. By means of this process Dr. Muter has obtained results showing a very high degree of accuracy. In two cases out of six, the amount of oil found agreed within $\frac{1}{10}$ of a per cent., and in the remaining cases, with the exception of one, within 1 per cent. of the amount actually present. I have carefully repeated Dr. Muter's experiments, thinking that though there are much simpler means available for the detection of fatty oils, the great accuracy attained would fully justify a somewhat tedious and troublesome process. My results, however, do not agree with those of Dr. Muter, as will be seen from the following numbers.

	Oil present.		Oil found.
No. 1	15·7 per cent.	(linseed)	12·1 per cent.
No. 2	38·2 ,,	(linseed)	29·5 ,,
No. 3	11·6 ,,	(castor)	5·4 ,,
No. 4	51·1 ,,	(castor)	39·6 ,,
No. 5	5·1 ,,	(linseed)	none
No. 6	27·3 ,,	(castor)	21·4 ,,

I have in all examined ten mixtures of balsam and oil, but am only quoting the numbers in those cases in which several analyses gave concordant results. My conclusion therefore is that the method is not accurate enough to warrant the trouble and expenditure of time. As a qualitative test it is very unsatisfactory and far too troublesome; in the presence of 5 per cent. of oil, it completely fails to indicate the adulteration, and with 10 per cent. it gives an indistinct result. On the other hand, it will be seen from the following, that the simple process of evaporation shows the presence of 1 per cent. of oil, and also admits of a rough calculation of the amount of adulteration.

Evaporation.—This is an excellent and exceedingly simple test, but is clumsily applied by many. Instead of boiling the balsam with water for many hours, a small quantity (about 1 to 1·5 gram) of the sample should be carefully heated in a watchglass until all the oil is driven off, which is the case as soon as the residue has assumed a rich brown colour. A few minutes suffice for the experiment. If the remaining resin is perfectly brittle and pulverizable, there is no fatty oil present, for 1 per cent. of oil would diminish the brittleness of the resin so that it cannot be reduced to a fine powder. One per cent. of oil is thus readily detected, and with larger quantities of the adulterant (3 to 5 per cent.), the resin feels quite sticky. On heating the resin, castor oil and linseed oil may be distinguished by the odour. By mixing the adulterated balsam with ten, twenty, thirty, forty, and fifty volumes of pure Maranham balsam respectively, and testing each dilution in this manner, it is easy to find in which the oil has been reduced to below 1 per cent., and thus to ascertain whether the adulterant amounted to more than 10, 20, 30, 40, or 50 per cent.; and this I think would be sufficiently near the mark for the purposes of public analysts. Mr. Conroy, of Liverpool, who has also had considerable experience in copaiba testing, informs me that he too relies on the evaporation as the best and by far the simplest mode of detecting fatty oils, and agrees with me as to the sensitiveness of the test. He places a drop of the hot resin (after evaporation of the essential oils), on a small piece of well glazed note paper; if the balsam be pure, the resin will fly off in hundreds of fragments on bending the paper when cold. I have examined upwards of twenty different samples of copaiba, each mixed with linseed oil and with castor oil in eight different proportions, and have come to the conclusion, that if a sample leaves a pulverizable resin on evaporation all further testing with alcohol and other reagents for fused oils, is merely a waste of time.

Detection of gurjun oil.—Flückiger's test with bisulphide of carbon and a mixture of nitric and sulphuric acids, as described in the Pharmacographia is a good one, especially if applied to a drop of the essential oil separated from the balsam by distillation with water. Its application direct to the balsam requires practice to prevent errors. Hager's test with petroleum ether, mentioned in the 'Year-Book of Pharmacy' for 1876, is also a good one; I have tried it extensively, and have every reason to be satisfied with it. A pure balsam when mixed with four volumes of petroleum ether yields a clear solution, which either remains clear on standing or forms an exceedingly slight deposit, coating the bottom of the tube like a thin film. In the presence of gurjun oil, however, a voluminous sediment is formed in the mixture after half an hour's standing. Benzol cannot be used for this test and is the more unsuited for it the purer it is, since pure benzol forms a perfectly clear solution with the adulterant. Dr. de Vrij, who recommended this substance for the detection of gurjun oil in copaiba has probably used an impure benzol in his experiments.

Detection of oil of turpentine.—This, I believe, is the only volatile oil likely to be used for adulterating copaiba. Any large admixture with this oil is easily found out by the odour on heating the balsam. For the detection of smaller quantities I rely on the difference in the boiling points of oil of copaiba and oil of turpentine, that of the former being 240°—250° C., and that of the latter about 160°. In distilling a small quantity of oil from the suspected balsam, oil of turpentine passes over before the oil of copaiba, and can be recognized by its odour on heating the first few drops of the distilled oil on a watch-glass. In this way I have been able to detect $2\frac{1}{2}$ per cent. of the adulterant.

I trust that in future editions of our standard works tests for the purity of drugs which experience has proved to be fallacious will be omitted, as through their occurrence in such books they are invested with a certain amount of authority likely to mislead those who are wanting in personal experience of the subject. The recent prosecutions for an alleged adulteration of copaiba serve as a good illustration of the sublime faith which analysts ignorant of the nature and properties of drugs may have in the authority of books. It appears strange too that persons without a proper knowledge of drugs can hold appointments under an Adulteration of Food and Drugs Act.

The PRESIDENT said Mr. Siebold's remarks were very interesting and valuable, although the whole subject had been pretty well worked out twenty years ago by himself and the results published in the *Pharmaceutical Journal.* Still the results then obtained, which entirely coincided with those found by Mr. Siebold, had been overlooked by writers on the subject, and tests which were then shown to be fallacious were still repeated. The result he then came to was that there was no test for the balsam which could be relied on, and that the only satisfactory mode of forming a judgment was first to separate it into its proximate component parts and to test the resin and the oil individually. His method for the separation of the resin was not quite so simple as that mentioned by Mr. Siebold—evaporation in a watch glass—because it comprehended not only the isolation of the resin but also the collection of the oil. Dr. Muter's test had certainly the appearance at first sight of being a very good one, and he had used it on some occasions with advantage, but he agreed with Mr. Siebold that it could never be entirely relied upon, especially in indicating a specimen as being entirely free from adulteration. With regard to the use of benzol as given in the Pharmacopœia it was introduced on the authority of a recent publication on the subject and only referred to the adulteration with gurjun balsam. The whole subject was well worthy the attention of pharmacists, and at a time when they were liable to have the articles they dealt in called in question it was especially important that they should repudiate tests which could not be depended upon.

Mr. MANBY asked if Mr. Siebold would mention what he considered the best vehicle for the entire solution of copaiba, without deteriorating its medicinal qualities.

Mr. EKIN asked how Mr. Siebold assured himself that the samples he analysed were genuine.

Mr. UMNEY was pleased to hear it acknowledged that there was variation in copaiba balsam; in his experience there was no drug which varied so much. Only last week a large quantity of Para balsam was offered for sale which was as limpid as turpentine. As had been said by himself and others, the variation would be as much as from 20 to 60 per cent. of volatile oil, and 20 to 60 per cent. of resin. He had, however, never seen copaiba resin which was easily pulverizable, as Mr. Siebold stated. He had taken 30 or 40 lbs from a still, fused it in a steam pan for six or seven hours, and found, even then, it refused to get brittle. He was not quite certain whether Mr. Siebold referred to benzol or benzoline when referring to Dr. Flükiger's test.

Mr. MOSS said that the limpid Para balsam was rarely to be found in the stock of the wholesale druggist, being used almost entirely for the distillation of the essential oil. He had not experienced the difficulty in using Flückiger's test for gurjun oil which had been referred to.

Mr. SIEBOLD, in reply, said benzol was a most excellent solvent for copaiba. He determined the genuineness of the sample by evaporating it on a watch glass, to show the absence of fatty oil; the next process was to separate a little of the essential oil and convince himself by its odour, and, if necessary, by taking the boiling point, that it was oil of copaiba and not oil of turpentine. He then performed the test for gurjun oil and not finding that, he was satisfied that the sample was pure, or at least free from all known adulterants. He had never met with an instance of adulteration with the oleoresin of Hardwickia pinnata. Probably the reason Mr. Umney had failed to obtain a brittle resin was because he had previously boiled it with water; if the water got into the interior of the resin it never turned out satisfactorily, but if it was evaporated in a dish or watch glass a brittle resin was always obtained, and it was this form of test which he recommended. Pure benzol was not a test for any impurity in copaiba, because it dissolved all known adulterants. Petroleum ether was very suitable for the detection of gurjun oil. In reply to Mr. Moss, he would add he did not say there was the slightest difficulty in detecting the presence of gurjun oil by Flückiger's test, if applied to the oil of copaiba. But if applied direct to the balsam, the test required some little practice to ensure correct results.

A vote of thanks was passed to Mr. Siebold, and the President stated that one of the samples he referred to as having been analysed by himself twenty years ago was still in the Museum of the Pharmaceutical Society, and side by side with it was a portion of the leaf, the sample having been collected by a member of the Society direct from the tree.

The next paper read was on—

A New Medicinal Solution of Phosphorus.

BY W. W. URWICK.

By the able paper Mr. Williams read on the administration of phosphorus, before the British Pharmaceutical Conference in 1874, giving a formula for the solution of phosphorus in glycerine and alcohol, and pointing out how a portion of the phosphorus became oxidized during the process, I was led to make one or two experiments with the desire to produce a formula not liable to change, for the administration of phosphorus in known doses and capable of administration without admixture if required. With this idea, I prepared phosphorus pills, and coated them with a solution of albumen; but after a time the pills ceased to be luminous on testing them, showing that phosphorus had disappeared and was no longer present in a free state. My friend Mr. Hampson has suggested that the albumen had become porous by drying. Though thus foiled, feeling I was on the right track, I turned my attention to making a solution that should be stable and contain known doses.

I adopted the suggestions made by Mr. Williams at the British Pharmaceutical Conference, with the following modifications:—I dissolved 2 grs. of phosphorus in absolute alcohol and glycerine at a temperature of about 170° Fahr., with the addition of a little cane sugar and sugar of milk, which addition, I have found, prevents any portion of the phosphorus passing into an acid state during the time of solution. When the solution is cold I add the albumen of one egg, first mixed with a little glycerine and alcohol, and then sufficient glycerine to measure 10 ounces; the strength of the finished product being $\frac{1}{40}$ of a grain to each drachm, which I find to be quite strong enough to admit of its being preserved a long time without change, and taken, if required, without dilution.

I have kept some solution for more than two years without the phosphorus passing into the amorphous state, or the solution becoming acid or losing its luminous properties when mixed with water and agitated.

In no case as yet have I found any change, except where it had been, for the purpose of experiment, exposed to the strong rays of the sun, day by day, for a period of near three months, when a slight trace of amorphous phosphorus became visible. So thoroughly does the albumen protect the phosphorus, that when the solution has been mixed with water, and kept for a week, it still shows phosphorescence on agitation.

Though the foregoing may have little in it worthy of mention, one or two points have presented themselves to my notice which I deem may be of interest. Wishing to make the solution somewhat more agreeable to the palate, I added a few drops of oil of neroli to the albuminated solution of phosphorus; when, to my surprise, in an instant the solution lost its smell and flavour of phosphorus, and also its power of showing phosphorescence when mixed with water and agitated—indeed the phosphorus seemed at once blotted out of existence; but blue litmus remained unchanged, pointing out that it had not been oxidized. The question, "How does the oil of neroli prevent oxidation?" is a very interesting one, and which I submit to the Conference. On this point, at present, I can give no satisfactory answer, but I found, on applying a strong heat to the solution with neroli, the peculiar ring-like fumes of phosphorus pentoxide formed. This may not be a crucial test, but points to the fact of the phosphorus being held in the solution with neroli in a free state. Yolk of egg deprives the solution of phosphorus of its luminosity, but still appears to hold the phosphorus in a free state. Indeed, the idea has occurred to me that the phosphorus natural to the egg occurs in the free state. Possibly it is the oily matter in yolk of egg that is the agent which absorbs the phosphorus from any solutions. On adding excess of the solution to the yolk, power of absorption is overcome and phosphorescence reappears.

Tincture of orange at once destroys the phosphorescence, smell, and flavour, as does also tinct. of gentian. With tincture of calumba and tincture of quassia, and tincture of nux vomica, the phosphorescence, smell, and flavour, remain unaltered.

Essence of lemon deprived the solution of its luminosity, but the smell and flavour remained in a modified form.

Oil of cloves also deprived the solution of its phosphorescence, smell, and flavour; but on agitation with water, and then standing, flashes of phosphorescence appeared at intervals, similar to electric sparks, and on keeping for two days the phosphorescence reappeared to a slight extent, but soon passed away.

With orange flower water the solution remains luminous nearly as long as it would with common water, retaining the smell and flavour of phosphorus. Milk destroys the phosphorescence, but the flavour and smell remain in a slightly modified state. Within this last week or two, these points have presented themselves to my observation, but to the present time I have not been able to trace the chemical change, if any, that takes place in the phosphorus, or what combination it forms with essential oils or milk.

The formula referred to is:

℞	Alcohol	$1\frac{1}{2}$ oz.
	Cane Sugar	$\frac{1}{2}$ oz.
	Sugar of Milk	$\frac{1}{4}$ oz.
	Albumen of one egg,	
	Phosphorus	2 grs.
	Glycerine to	10 oz.

The President said the mode suggested for the solution of phosphorus was almost identical with one he had himself recommended, the principal difference being that he had suggested the mixture of oil and phosphorus with yolk of egg and water, which, with the addition of a little spirit of chloroform made a mixture as palatable in his opinion as could be produced, and which would keep perfectly well without change for any reasonable time.

Mr. Williams said it was very interesting to find what an influence albumen and sugar appeared to have in preserving the phosphorus. The point of the paper was that the solution if examined with test paper was found to be in no way acid, proving that the phosphorus was not oxidized, but was really in its free state, which was not the case with most of the phosphorus solutions The fact that some essential oils appeared to have the power of destroying the active condition of the phosphorus was an observation that deserved to be recorded.

Mr. Greenish said the one great objection to all these fluid preparations was, that when taken the eructations were so exceedingly disagreeable. He thought the pill of phosphorus in cacao butter less liable to this objection, and if to this a little Canada balsam were added the pill was made more plastic, and passed lower down the stomach before dissolving, so that the unpleasant sensations to which he had referred were avoided.

A vote of thanks was recorded to Mr. Urwick.

The next paper read was on—

Albumin of Commerce.

BY CHARLES T. KINGZETT, F.C.S., AND M. ZINGLER.

As is well known, albumin is largely employed for fixing certain colours on cotton goods, such colours, for instance, as madder-red and indigo-blue, which are almost the only fast colours possessed by dyers.

For fixing these and other colours egg albumin is well adapted, and would be without fault, were it not for its high price. As it is, its use withdraws large numbers of eggs from the food market, and although blood albumin has to some extent taken its place in printing applications, yet this can only be employed for the inferior and darker colours.

It must be remembered that in printing, albumin serves a double purpose; it acts as a vehicle for the colour, and serves simultaneously as a varnish.

1008 eggs are said to yield* on an average six litres (1·3 gallons) of the whites in a fluid state, and four litres (·8 gallon) of the yolks. The white is evaporated upon zinc trays slightly greased with olive oil, and maintained at a temperature of about 30° to 35° C. The olive oil is used to prevent the adhesion of the albumin to the metal trays. In this way 14 per cent. of commercial albumin is obtained.

The evaporation is resorted to mainly, because, as is well known, solutions of albumin very soon undergo putrefaction. But before use, the albumin has to be re-dissolved, and this is best done by adding it in a powdered state to water at 113° to 122° F. (45° to 50° C.), keeping the mixture well stirred to prevent agglutination of the albuminous particles. The water should never be added to the albumin. The strength of the solution employed varies with the specific nature of the use, but on an average, a solution containing 300 grms. to the litre is used, or nearly 3 lbs. to the gallon. It is necessary to filter such solution through a fine silk sieve in order to absolutely free them from membranous tissue derived from the shells of the egg, otherwise the particles give rise to dark spots on the printed cloth. Egg albumin prepared as described, is used for fixing the better colours and for all finer purposes, but its high price militates against its universal employment, commanding as it does from 4*s.* to 4*s.* 6*d.* per lb. (dry scales).

Blood albumin occurs in commerce in various forms.

The most inferior variety is packed in casks in the liquid state, and consists merely of blood, which has been defibrinated by whipping. It is very dark red in colour, from the suspension of corpuscles, and soon putrefies, giving rise to stinking gases, which sometimes cause the casks actually to burst.

This same quality of blood albumin also occurs in the form of shining black scales, which on dissolving in water, yield a cheap but dark coloured albumin solution.

The purer forms of blood albumin are prepared as follows: The blood of slaughtered animals is collected in circular or square flat-bottomed and shallow basins with vertical sides. These are from 12 to 14 inches in diameter, and 4 inches in depth, containing about two gallons each. While standing in these vessels, during from two to six hours, the blood coagulates, and when this has happened, the clearer serum is run off into filters of a construction similar in form to the other vessels, but pierced with holes of about two inches in diameter, and lined with a dense cotton or linen cloth. The filtered liquor is allowed to subside during about twelve or fourteen hours, and the product is used for the lighter and brighter colours.

The clot is cut up and drained, and gives a further quantity of a somewhat darker albumin solution. To obtain the scales of commerce, these solutions are evaporated by a low steam heat, in thin films. The clot, consisting of the fibrin and corpuscles, is sold as a manure.

Five oxen, or twenty sheep, or thirty-four calves, are said to yield the same quantity of dry albumin, namely, 2 lbs. About 3*d.* is paid for the blood of each beast. Four gallons of blood, costing 10½*d.*, yield one gallon (or 25 per cent.) serum, costing 1*s.*; one gallon of serum yields fifteen ounces of dry albumin, of a quality which, at the present, is worth 1*s.* 2*d.* per lb. The price has rarely gone above 1*s.* 9*d.* per lb. It is thus seen that the market value of blood albumin barely covers the cost of production.

In producing blood albumin of commerce, the object to bear in mind, is the attainment of a substance whose solution is free from colour, possesses perfect coagulability, and which is cheap. On account of the superior price and value of egg albumin, it has for many years been a matter of desire to prepare a blood albumin of a similar whiteness and quality, and various attempts have been made in this direction. The only ones we need mention are as follows:

Animal charcoal is sometimes used in order to remove the colour to some extent, but the precise method of using it is kept secret by manufacturers.

Incipient coagulation is also resorted to by others, a given small amount of coagulated albumin carrying down with it a considerable amount of colouring matter.

Air rendered ozonic by means of electric induction has also been employed, but the quantity of available ozone thus procurable is not nearly sufficient for the purpose, if the element of cost be at all taken into consideration. Again, it has been proposed to add peroxide of hydrogen to blood albumin solution, but this reagent is far too costly to be employed, as ordinarily prepared. Another plan to which resort has been made consists in adding turpentine and allowing the mixture to stand during some time with occasional stirring.

None of these plans are competent to produce an albumin at all comparable in value to egg albumin.

We now proceed to describe the process for which letters patent have been granted to us. It may be conducted upon blood itself, or defibrinated blood produced by whipping or preferably upon the serum of blood prepared as described. When conducted upon the serum of blood, the product contains about 17 ounces albumin to the gallon, whereas, as already pointed out, the original serum contains about 15 ounces to the gallon; in other words there is a considerable concentration. This solution is strong enough for many purposes, but for certain other purposes it should contain from 30 to 40 ounces to the gallon, and such a strength may be obtained by dissolving in the serum before treatment the requisite amount of commercial dried blood albumin.

In any case the solution to be treated is placed in a suitable apparatus, and to it is added about 5 per cent. of crude turpentine; into the mixture maintained at about 30° to 60° C, a current of air is blown rapidly, the turpentine which is carried over as vapour being condensed by suitable means, and continually returned to the mixture. After a period varying (according to the quantity to be bleached) from two to ten hours, the operation is concluded, and all that remains to be done is to allow the product to settle, syphon off the albumin solution from any residual oil and complete the operation by filtration through French grey paper. In this way an albumin solution is obtained, which will keep well during the whole of the hottest summer, without the slightest decomposition, and which is as white as egg albumin.

We were led in the first place to this discovery by experimenting with the solution of "Sanitas," which is now being largely manufactured. It will be remembered that in a number of researches (a summary of which will be found in the *Society of Arts Journal*, Feb. 16, 1877) upon the oxidation of terpenes and allied hydrocarbons, one of us found that the aerial oxidation of turpentine resulted in the production of peroxide of hydrogen, camphor, camphoric acid, and other substances, which form the constituents of "Sanitas." This solution we found competent to bleach blood and blood albumin solution, but as the quantity which it was necessary to use was considerable, after-evaporation had to be employed to get the albumin of a strength suitable for its various applications. This method was therefore abandoned and the process above described resorted to, whereby the particular substances resulting from the oxidation of turpentine are produced *in situ*. In this way the albumin solutions are entirely bleached by the peroxide of hydrogen, while the camphor

* 'Handbook of Dyeing and Calico Printing.' By W. Crookes, F.R.S.

camphoric acid, and other bodies simultaneously formed exercise an antiseptic action, and preserve the albumin absolutely from decay and putrefaction.

We do not here propose to define the nature and function of an antiseptic or disinfectant, but taking an infectant to be that body which causes disease, and further accepting that which is ordinarily believed, viz., that disease is often caused by the putrefaction of albuminous principles, then we have in "Sanitas" a true antiseptic and disinfectant, for it absolutely prevents that putrefaction. It should be here stated that the presence of even traces of phenol is sufficient to almost entirely prevent the bleaching of blood albumin, either directly by "Sanitas" or by the oxidation process *in situ* already described.

The albumin solution prepared by our process is, in its general characters, analogous to ordinary forms of albumin. The coagulation which results on heating is, however, somewhat different; instead of being precipitated in flocks and flakes it entirely gelatinizes. Moreover, when dried down, the albumin is not so soluble as the ordinary forms; this, however, is no objection, and indeed is an advantage, for there is no necessity to evaporate it down, keeping perfectly fresh as it does in solution; moreover, by its use some colours are better fixed than by the ordinary commercial albumin. Besides the use of our albumin in printing there are various other applications of it, which we have also patented. For preparing photographic paper it appears to be admirably suited, while as a varnish when used either alone or in conjunction with other bodies as set forth in our specifications, for violins, pianofortes, and articles of furniture generally, it answers excellently, giving a beautiful gloss, and improving the timbre of musical instruments.

It admits of general use also for sizing and enamelling articles of wood, glass, or metal. For purposes of painting, the pigment is intermixed with the albumin solution and then applied in the ordinary way.

In pharmacy this albumin solution is extremely suitable for the precipitation of starchy matters in sarsaparilla and other decoctions, and of course possesses the advantage already stated, that it may be kept in the state of solution.

The cost of bleaching blood albumin by our process is but small, and is amply covered by the increased value of the product. It should also be stated that the above observations do not merely relate to laboratory experiments but also to larger experiments and to the actual manufacture.

As regards the chemical changes involved in the bleaching process we have very little to say. It is well known that fibrin has the power of decomposing peroxide of hydrogen into water and nascent oxygen; ordinary albumin, however, lacks this power, although the rationale of the bleaching process is, no doubt, very similar, the colouring matter of the blood assimilating the second atom of oxygen from the hydric peroxide which is reduced to water. To hematocrystalline (or cruorine), which constitutes the colouring-matter of blood the formula $C_{600}H_{960}N_{154}FeS_3O_{177}$ is ordinarily assigned, with an atomic weight of 13,280. No matter what amount of doubt may be associated with the idea of such a chemical individual, the fact remains that blood crystals of hematocrystalline always contain four-tenths per cent. of iron. From hematocrystalline, hematine may be obtained with the formula $C_{32}H_{32}Fe_4NO_6$,* and not unlikely it is this body which undergoes the oxidation under consideration, resulting in the bleaching of blood albumin solutions.

Of the relative constitution of hematine nothing is known.

* Thudichum and Kingzett on hemine, hematine, and phosphorized substance present in blood corpuscles.—*Journ. Chem. Soc.*, September, 1876.

Note on Pilocarpine (from Jaborandi).

BY C. T. KINGZETT, F.C.S.

A few weeks ago Professor Attfield kindly gave me a few crystals of the nitrate of pilocarpine, and a few grains also of the platinic chloride salt. These I have since examined as follows:—

The crystals of nitrate were large and hard; when a little was burnt on a piece of platinum foil it blackened, fused, emitted white inflammable vapours and left a little ash. This fact and the slightly yellow colour of the crystals signified that the salt was not quite pure.

The rest was dissolved in water and aqueous solution of platinic chloride added, when the mixture went solid by formation of crystals. More water was added and hydrochloric acid to decided acidity, and the solution thus obtained allowed to crystallize. Along with the crystals a little viscid uncrystallizable deposit was thrown down. The crystals were isolated, washed, and dried at 100° C.; there was only 0·125 gram when dry. It showed on analysis 24·8 per cent. platinum and 26·71 per cent. chlorine. (Relation 1:6). I have shown in a previous publication* that pilocarpine has the formula $C_{23}H_{34}N_4O_4$, and its dihydrochloride platinic chloride combination that of $C_{23}H_{34}N_4O_4\ 2\ HCl\ Pt\ Cl_4$ requiring 23·4 per cent. platinum, and 25·2 per cent. chlorine.

It would, therefore, appear (so far as could be ascertained from the extremely limited amount in my possession), that this salt prepared from the nitrate was identical with that I had previously analysed, but contained a slight excess of platinum chloride.

The platinum salt given me by Professor Attfield weighed 1·5 grams. This I distilled to dryness with an excess of pure caustic soda (made from the metal). The distillate was alkaline and had the odour of trimethylamine, whose reactions,† so far as could be determined, it gave, that is to say, it gave a very light blue precipitate with cupric sulphate insoluble in excess, and a faint precipitate with aqueous platinic chloride solution; both precipitates appeared soluble in boiling water.

It is, therefore, confirmed that (which I have previously demonstrated) jaborandi yields but one alkaloid, and it appears that this yields trimethylamine as stated.

The President drew the attention of the Conference to some samples of nitrate of pilocarpine, prepared by Mr. Gerrard.

Mr. Gerrard said there was a great difference in the appearance of the crystals when produced from water and from alcohol. When the nitrate was boiled in alcohol it recrystallized on cooling in perfectly white crystals, but on a re-solution in water and recrystallization they had not that beautiful white crystalline appearance. One of the samples on the table had been recrystallized from water four times. He had tried many processes for the preparation of this alkaloid, but with a slight modification had returned to the one by which he first obtained it, exhaustion with ordinary spirit of wine, only that the spirit should be acidified with a little tartaric acid, an addition similar to that in Duquesnel's process for obtaining aconitine. The Société de Pharmacie had adopted a very similar process, except that it used chloroform and the chloroform extract from the mother liquor was shaken up with dilute hydrochloric acid. That however would not work well commercially; it was better to distil off the chloroform and work with the residue.

The thanks of the meetings were awarded to Mr. Kingzett for his two papers.

(*To be continued.*)

* *Journal of the Chemical Society*, October, 1876.

† See paper by M. C. Vincent in 'Bulletin de la Société Chimique de Paris,' No. 5. March 5, 1877.

Parliamentary and Law Proceedings.

Prosecution under the Arsenic Act.

At the Rugeley Petty Sessions, held on the 20th inst., before J. Spode, Esq., Lord Zouche and T. J. Birch, Esq., a police constable of the Staffordshire constabulary, named Ralph Ratcliffe, was charged with having on the 31st of August last at Rugeley, when purchasing and demanding certain arsenic from Thomas Greensmith, chemist of Rugeley, given false information in relation to the purpose for which the arsenic was required, which he, the said Thomas Greensmith, was authorized to inquire into from him, viz., by stating that the arsenic was for George Dinneford, for the purpose of poisoning mice, whereas it was not intended for such person or purpose.

Mr. Glaisyer, solicitor to the Chemists and Druggists' Trade Association, Birmingham, prosecuted, and Mr. Horatio Brevitt, clerk to the Wolverhampton County Magistrates, defended.

Mr. Glaisyer said, the summons was issued under the 15 and 16 Vic. cap. 13, sec. 1 and 4, commonly known as the Arsenic Act, which provided that any person selling arsenic should forthwith enter, or cause to be entered, in a regular manner, in a book kept by such person for that purpose, according to the form which was set forth, a statement of such sale, with the quantity of arsenic so sold, and the purpose for which such arsenic was required or stated to be required, and the day of the month and year of the sale, and the name, place of abode, and condition or occupation of the purchaser, into all which circumstances the person selling such arsenic was by the statute required, and authorized to enquire; it was also enacted, if any person purchasing such poison should give false information in relation to the particulars of the purchase, every person so offending should be liable to a penalty not exceeding £20, upon summary conviction before two justices of the peace.

He ventured to say that Mr. Greensmith had been summoned a fortnight previously for selling to this police constable a small quantity of arsenic without making use of all the formalities prescribed by the Act. The present charge was not taken up from spite against the policeman but ou public grounds, simply in order to show that the general body of chemists and druggists throughout the country could not be prosecuted with impunity on charges which were supported by means of falsehood and deceit. There could be no doubt that the offence had been committed, for not only should he prove by the evidence of Mr. Greensmith that the defendant went into his shop and purchased some arsenic, stating that he wanted it for Mr. Dinneford, head gardener at Wolseley Hall, for the purpose of killing mice in the greenhouses, but he should call Mr. Dinneford to prove that defendant was entirely unknown to him, that he did not send him for the poison, and that he had not used or required any poison for mice. This evidence was supplemented by the confession of the defendant when in the witness box at the last Petty Sessions, when he admitted the statement made to Mr. Greensmith was entirely false the Bench on that occasion considered that the offence was one of a very serious nature, and inflicted a penalty of £1, not so much, the Chairman had stated, as a punishment, but as a warning to other tradesmen to prevent them from acting in a similar way; but he wished to know if the present case was not quite as serious, or more so. In Mr. Greensmith's case, that gentleman was innocently led to supply poison for the use of a person who was a regular customer of his for a very usual purpose, but in the present case the police constable, under the direction of the chief constable, told lies in order to procure a case upon which to prosecute Mr. Greensmith. He argued that the man who told lies to obtain evidence upon which to found a prosecution would be the most likely man to tell lies on oath in the witness box to obtain a conviction. He was aware that public opinion was rather in favour of these methods of detection in order to procure cases, but that such practices could quickly turn the use of lies and deceit to still more serious purposes had been proved by the recent disclosures in the Bow Street detective's case. It might possibly be argued that the defendant was instructed by the chief constable to take the course he had followed, but if so, he thought this only aggravated the offence and showed that the chief constable was a man by whom falsehood was regarded with complacency, and who gave to his inferior officers encouragement in this line of conduct.

Mr. Brevitt remonstrated against this attack on the chief constable, who had nothing to do with the case.

Mr. Glaisyer said, on the contrary, the defendant himself admitted on oath in the witness box at the last Petty Sessions, that he was acting under the instructions of the chief constable in stating the poison was required for Mr. Dinneford for killing mice. He continued to say that the direction of the chief constable, although it revealed the practice of the force, did not justify the defendant for following such instructions, nor did the order of his superior officer justify the defendant in breaking the law. He concluded by saying that it was not often that a bench of magistrates had such an opportunity of expressing an opinion upon this system of detection, and he therefore asked the bench to pass a severe censure upon the conduct of the defendant, and to inflict a heavy penalty, to add force to their expression of dissatisfaction.

Mr. Thomas Greensmith, chemist and druggist, of Rugeley, stated that the defendant came into his shop in plain clothes on the 31st of August, and said he wanted some poison, particularly asking for arsenic. In reply to questions from witness, defendant said he wanted it for Mr. Dinneford, the head gardener at Wolseley Hall, for the purpose of poisoning mice in the greenhouse. As Mr. Dinneford was a regular customer, witness did not hesitate to supply him with the poison. He saw defendant in the witness box at the last Petty Sessions, when defendant said that he had acted upon the instructions of the chief constable, that he did not know Mr. Dinneford, and that the statement he made to witness in the shop was a false one.

Mr. Brevitt cross-examined the witness at some length.

Mr. George Dinneford, head gardener at Wolseley Hall, was called to prove that he knew nothing of the defendant, nor had he authorized him to purchase arsenic.

Mr. Brevitt, in his remarks for the defence, said the question before the Bench was, whether the defendant really made a false statement or not in answer to the questions which were asked him. The particulars required by the Act of Parliament to be demanded from the defendant were, first, the statement of the sale, and here there was no falsehood. The next questions were the quantity of arsenic sold, the date, month and year; these were correct as was also the name of the purchaser. The next was "for whom the poison is required or stated to be required," and he (Mr. Brevitt) said that Mr. Greensmith should have asked this question and not for whom it was required, a question which had no right to be put. He asked the Bench to give their most serious consideration to this fact, and not to convict the defendant because he employed these means in order to detect the plaintiff, who, according to his own evidence, showed great irregularity in the manner in which he had kept his poison book. In continuation, Mr. Brevitt said that notwithstanding these irregularities of the plaintiff the Bench were asked to convict the defendant, whose only fault appeared to be that he had obtained a conviction against Mr. Greensmith; he argued that there had been no false information given to the prosecutor in reply to questions asked of him. There was no evidence to show that defendant did not require the poison for the purpose he named, and even now he might hand it over to Mr. Dinneford for that purpose, whilst the question as to whom the poison was for was entirely an illegal one.

The Chairman, after some consideration, said the Bench considered that in the present case the act had been broken, and so far they were bound to convict, but at the same time they did not think defendant committed the offence with the slightest illegal intention, a nominal fine only would be imposed, namely, one shilling and costs.

Illegal Sale of Poisons.

At the Walsall Petty Sessions on Wednesday, 26th July, 1877, Major Newman in the chair, James Tyrer, 65, Upper Rushall Street, Walsall, Staffordshire, was summoned for "that on the 19th September, 1877, at the said borough, he unlawfully sold to William Frederic Haydon certain poison, to wit oxalic acid, in a certain packet, the cover of which packet did not set forth the name of the seller of the same, contrary to the statute in such case made and provided."

Mr. Henry Glaisyer (Solicitor to the Chemists and Druggists' Trade Association) appeared in support of the summons, and Mr. Williams (from the office of Messrs. Duignan, Lewis and Lewis, solicitors, Walsall) defended.

The case created great interest in the town, many chemists and druggists being present during the hearing of the charge.

Mr. Glaisyer, in opening the case, said he appeared to prosecute, the information being laid by Mr. William Frederic Haydon (Secretary to the Chemists and Druggists' Trade Association of Great Britain), under the instructions of the officers of that Society. The summons was issued under the 17th section of the 31st and 32nd Victoria, Chap. XXI, which enacts that "It shall be unlawful to sell any poison, either by wholesale or by retail, unless the box, bottle, vessel, wrapper, or cover, in which such poison is contained be distinctly labelled with the name and address of the seller of the poison." The section further stated that "Any persons selling poison otherwise than herein provided shall, upon a summary conviction before the justices of the peace in England, or the sheriff in Scotland, be liable to a penalty not exceeding five pounds for the first offence, and to a penalty not exceeding ten pounds for the second or any subsequent offence, and for the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller." Mr. Haydon went to Walsall on the 19th inst., visited the shop number 64, Upper Rushall Street, and purchased from the defendant one pennyworth of oxalic acid. The label placed upon the packet stated "Edwin Constable, Chemist and Druggist," the seller. He should, however, be able to prove that James Tyrer was the seller within the meaning of the Act. He should put into the witness box Mr. Francis Keep, the landlord of the premises, from whom he understood defendant had taken a lease. He should prove that Mr. Tyrer purchased the fixtures from the previous tenant, also that the poor rates were assessed to the defendant, and that gas supplied to the premises was paid for by him. He need not, he said, point out the necessity of the requirements for the sale of poisons being adhered to, but he would point out that the defendant, who was not qualified, had been carrying on the business of a chemist and druggist under an assumed name. In conclusion, Mr. Glaisyer stated that the prosecution having been instituted upon public grounds the Secretary was instructed to ask for no part of the penalty.

William Frederic Haydon, examined by Mr. Glaisyer.

What is your name?—William Frederic Haydon.

Where do you reside?—At Birmingham.

What is your profession?—I am a pharmaceutical chemist.

What appointment do you hold?—The secretaryship of the Chemists and Druggists' Trade Association of Great Britain.

Did you come to Walsall on the 19th inst., and what then took place?—I came to Walsall on the 19th inst., and went to No. 94, Upper Rushall Street, where I purchased from the defendant one pennyworth of oxalic acid.

Who attended to you?—I was served by the defendant.

Was the poison wrapped in paper?—The oxalic acid was wrapped in this packet. (Packet produced, labelled "Oxalic Acid. Poison. Edwin Constable, Chemist and Druggist, 64, Upper Rushall Street, Walsall.")

Since the purchase of this poison have you tested it?—I have.

What is the result of your analysis?—I find it to be a good sample of oxalic acid.

Is the defendant qualified to sell poisons enumerated in the schedules of the Pharmacy Act?—He is not.

How do you prove this?—His name does not appear on the last published Register of Chemists and Druggists, nor has he passed any examination since this register (book produced) was issued qualifying him to trade as a chemist and druggist.

The name of James Tyrer does not appear on the register you have produced?—It does not.

You laid the information in this case?—I did, in my official capacity of Secretary of the Chemists and Druggists' Trade Association.

And you are instructed not to apply for any portion of the penalty?—I shall not do so.

Cross-examined by Mr. Williams: You went yourself to 64, Upper Rushall Street?—I did.

Is there any name over the shop door or window?—There is a name over the door.

What is it?—Constable.

Is it Edwin Constable, chemist and druggist?—No, simply Constable.

Did you see any placards or notices inside the shop, with the name Constable?—I did not.

Nor bill-heads?—No.

You noticed the labels on the bottles, I suppose?—Not particularly.

You had a glass tray with bottles under your nose, I presume?—I do not recollect either a glass tray or bottles under my nose.

Having gone in the character of an informer you did not look round and notice these things?—I did not.

And yet you went to find out what you could against this person?—I went to purchase oxalic acid.

With a view of issuing this summons?—Yes.

I suppose you did not have any bill for the oxalic acid?—I did not.

Look at the head of that, please (Bill head produced bearing the name of "E. Constable, Chemist and Druggist, Walsall.") You did not see any of these bill-heads, did you?—No, I imagine the defendant would not place bill-heads on the counter.

Yes, but they might have been hanging about. You did not see any?—No.

Have you opened the packet of poison?—Yes.

You opened it and took some out?—I did, for the purpose of testing it.

How did you test it?—By means of chemical tests.

Will you tell me the kind of tests you employed?—I dissolved a portion of the acid in pure water and filtered the solution. I dipped a strip of litmus paper into the filtrate, which turned of a red colour, proving the presence of an acid. I found no trace of any of the metals in the solution. A portion of the solution treated with solution of chloride of barium threw down a white precipitate of oxalate of barium; another portion of the solution treated with a solution of nitrate of silver threw down a white precipitate of oxalate of silver; a third portion of the solution treated with a solution of chloride of calcium, deposited a white precipitate of oxalate of calcium, insoluble in acetic acid, soluble in hydrochloric acid. I mixed a little of the dry substance with black oxide of manganese, free from carbonates, sulphuric acid and water, when carbonic acid gas was evolved, proved by passing the same into lime water, when a dense white precipitate of carbonate of lime was thrown down.

From the result of these tests you considered it was a good sample of oxalic acid?—The results of the tests I have enumerated proved the substance to be oxalic acid.

Yes, but how did you know it was a good sample?—By heating a portion of the dry acid to 350 degrees Fahrenheit's thermometer, when nearly the whole of it disappeared. Had the whole of it been dissipated it would have passed the British Pharmacopœia test for pure oxalic acid.

You are not a public analyst?—I am not.

You have not submitted this to an analyst?—No.

Do you know whose name is over the shop?—Yes.

Do you know he is a chemist?—His name does not appear on the printed Register of Chemists and Druggists, but I find on reference to the report of the proceedings of the Pharmaceutical Council, on May 2nd last, a certain Edwin Constable, 223, Green Lanes, Small Heath, Birmingham, was at the meeting of that Council ordered to be restored to the Register of Chemists and Druggists.

Do you know that as a chemist he is properly authorized to sell poisons?—Yes.

You have no doubt about it?—No, I have no doubt of it.

You have given a receipt for his annual subscription to your Association?—I am aware that his name appears on our list of members.

Have you received from Mr. Constable his subscription for the present year?—I have received from Mr. Elliott, chemist, residing at Walsall, the sum of five shillings paid to him by the defendant in the name of Edwin Constable. I may perhaps be allowed to explain—

This is the receipt is it not? (receipt produced)—Yes.

Re-examined by Mr. Glaisyer: You wish to offer some explanation as to the receipt. Will you please tell the Bench what it is?—I will do so. Our membership subscription is five shillings per annum, due in advance on the 1st of July in each year. The subscriptions are remitted to my office by the members themselves, or in many instances, where we have several members in a town, a friendly member will kindly undertake to collect the whole of the subscriptions in the town in which he resides, and forward the amount to me in one sum, thereby saving me a considerable amount of labour in forwarding to each member a direct application for his subscription. In this way Mr. George Elliott, chemist and druggist, of this town, collected the subscriptions of members residing here, and on the 7th August last he forwarded me a remittance to cover the subscriptions of eleven members, amongst the names of the new members being that of Edwin Constable. I have since ascertained that he is not in business at Walsall, but that the defendant is trading here in his name. Residing at Birmingham I had no means of ascertaining that Edwin Constable was not in business at Walsall, without making direct inquiries, for which, at the time his subscription was paid through Mr. Elliott to me, I saw no cause.

Does the name of Edwin Constable appear as a chemist and druggist residing at Walsall on any official register?—It does not.

Re-examined by Mr. Williams: You say it was resolved at a meeting of the Pharmaceutical Council to restore the name of Edwin Constable to the register?—Yes; the name of Edwin Constable, 223, Green Lanes, Small Heath, Birmingham.

No register has since been published?—No.

Then in the ordinary course of things his name will appear on the next published register?—Yes; as residing at Birmingham.

Francis Keep, Bank Buildings, Walsall, called and examined by Mr. Glaisyer.

Are you the owner of 64, Upper Rushall Street, Walsall?—I am.

Who is your tenant of that property?—James Tyrer.

Have you granted any lease to him?—Yes; (lease produced dated 30th December, 1876, for a term of twenty-one years at an annual rental of £60—a clause showed that the defendant had no power to sublet any part of the premises without the written sanction of the landlord).

Have you given the defendant permission to sublet any portion of the premises in question?—No.

Robert Leighton, Assistant Overseer for the Walsall Borough, appeared on subpœna and produced the rate book.

Mr. Williams remarked that to save time he would admit that defendant paid the rates.

Mr. Glaisyer: And the gas?

Mr. Williams: I will not say anything about gas.

Mr. Glaisyer: Then we will call Mr. Stackhouse the collector.

Mr. Williams: Very well; I will admit he pays gas also.

Mr. Henry Hobson, chemist and druggist, of 89, Ablewed Street, Walsall, attended upon subpœna. He testified to being a former tenant of the premises now occupied by the defendant, and upon leaving in March last, to selling the fixtures of the shop to the defendant. Since that time he had no dealings with him. He knew nothing of Constable, and was not aware that he ever saw him.

Cross-examined by Mr. Williams: When did you first see Mr. Haydon?—On Wednesday last.

Before or after this purchase was made?—After the purchase was made, and I wish it to be understood that I have had nothing to do with this prosecution.

Police-Constable Stringer, sworn and examined by Mr. Glaisyer, said on the previous Monday morning he went to 64, Upper Rushall Street, and asked for Mr. Tyrer; defendant replied, "I am the man." Witness gave him the summons, upon which he remarked, "I expected so." Witness said, "What have you been doing?" Defendant replied, "I have not passed my examinations; it was an error on my part; I am using Mr. Constable's name."

Mr. Glaisyer said this was the case for the prosecution.

For the defence, Mr. Williams submitted that the case had not been made out. He thought the magistrates would see at once that the prosecution had made a mistake, and that he had no case whatever to answer, they having chosen to proceed under the 17th section of the Act, instead of under an earlier section, viz., the 1st. They found Mr. Tyrer—at least, they said so, but he would not admit it—without a certificate, carrying on the business of a chemist and druggist, and they put a policeman into the box to say that defendant admitted to him having committed an error, in not having passed his examination, and still using Mr. Constable's name. He would deny that, if that were true, it would be an infringement of the Act. Persons might sell drugs, so long as they did not sell poisons, without having a certificate, and had the prosecution found that defendant had prescribed or done anything within the meaning of the Act, they might have proceeded under the 1st section, and charged him with illegally trading as a chemist and druggist. Instead of this, however, they had proceeded under the 17th.

Mr. Glaisyer: You are wrong, I think this section alone deals with the labelling of poisons.

Mr. Williams: That is not what I mean; chemists and druggists within the meaning of the Act may be persons who assist others "for the compounding of the prescriptions of duly medical practitioners, also of assistants and associates."

Mr. Glaisyer: Who have been duly registered.

Mr. Williams, resuming: So it was required to label the poison with the name and address of the seller and that "for the purpose of this (17th) section the person on whose behalf any sale is made by an apprentice or servant shall be deemed to be the seller." It was not simply because a men stood behind the counter that he was to be deemed the "seller." The "seller" was the responsible person against whom there would be a remedy in case of anyone being wrongly supplied. It had been admitted that Mr. Constable was a chemist and druggist, that the packet of poison bore his name, and that the name was also over the door. That being the case how could the prosecution say that Mr. Constable was not the "seller," and defendant had but simply supplied the poison on his behalf. The prosecution had no evidence that defendant had not sublet the premises.

Mr. Glaisyer: Yes, we have.

Mr. Williams: You have only the evidence that no lease or licence has been applied for. There was no evidence whatever that Mr. Constable was not the person on whose behalf the poison was sold, or that the requirements of the Act had not been complied with. For all they knew defendant might be in some way engaged by Mr. Constable, and it was for the prosecution to prove their case, not for him to prove a negative. It was all very well that Mr. Haydon was Secretary to the Society, but he was none the less an informer, and for the pennyworth of oxalic acid tried to make his client liable to a penalty of five pounds. He hoped the magistrates would require strict proof that the offence had been committed. He did not say that if the charge had been brought under the first or second section he might not have considered it necessary to put witnesses into the box, but being brought under the seventeenth section he should call no evidence but simply leave the case in the hands of the Bench.

The magistrates retired for consultation, on their return the Chairman said, "We consider the case proved satisfactorily, and as a high penalty is not asked for the fine will be twenty shillings and costs."

Dispensing Memoranda.

We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be conidered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.

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[26]. UNG. HYOSCYAMI.—Perhaps some of the adjoined formulæ may meet the case of Mr. Bevan—

(*Dorvault*).

℞ Ext. Hyoscyam. . . . . ʒj.
Adipis . . . . ʒj.

(*Middlesex Hospital*).

℞ Ext. Hyoscy.,
Adipis . . . . āā ʒss.
Glycerini . . . . ʒj.

(*Pharmacy Wirtemb*).

℞ Fol. Hyoscyam. Rec. . . . . ℔j.
Adipis . . . . ℥x.
Ol. Sem. Hyoscy. . . . . ℥ij.

(*Van Moas*).

℞ Ol. Lem. Hyoscyam. . . . . ℥iv.
Feculæ Hyoscyam. . . . . ʒj.
Ceræ Albæ . . . . ʒj.

(*Geiger*).

℞ Fol. Hyoscyam. Rec. . . . . . ℔ij.
Ol. Olivæ . . . . ℔iv ℥ix.
Ceræ Flav. . . . . ℔j. ℥iij.

COOKE and Co.

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[27]. AQ. CAMPH. CONC.—In answer to *T.* I have long used a conc. camphor julep prepared as follows:—

Camphor . . . . 95 grs.
Sp. Vini Rect. . . . . 5¾ ℥. Solve.

One part of this to thirty-two of water makes a perfectly clear aq. camph.

In the *Chemist and Druggist* a recipe is given, the proportions are—

Camphor . . . . ℥j.
Sp. Vini Rect. . . . . ℥x by weight.

C. F. BRUCE.

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[27]. AQ. CAMPH. CONC.—Try a weak solution of camphor in rectified spirit, and add a little tincture of myrrh.

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[28].—A lotion (containing one of each in 60) having to a great extent the characters desired by Mr. Brookes can be obtained by using lac sulphuris instead of sulph. præcipitatum, B.P., and rubbing the ingredients down with a few drops of glycerine. The presence of calcium sulphate renders the mixture smoother and also gives it a more milky appearance.

O. WALLIS.

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[28]. Try the addition of some sodium hyposulphite.

FELIX STEVENS.

51, *Judd Street.*

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[29]. TINCT. CHINÆ NIT.—Can any reader give me the formula for tincturæ chinæ nit.?

A COUNTRY DISPENSER.

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[30].—How should the following prescription be dispensed, and what is the dose of ergotine?

℞ Hyd. Bichlor. . . . . gr. $\frac{1}{12}$
Ergotine . . . . gr. iij.
Ext. Belladonnæ . . . . gr. ¼.
Ft. pil. Mittæ xij.

Also the following:—

℞ Peps. Porci . . . . gr. 3
Acid Carbolic. . . . . gr. j.
Ext. Belladonnæ . . . . gr. ⅓.
Ol. Caryophylli . . . . ♏ j.
Ft. pil. j. Mittæ xij. in argent.

FRANCIS S. MORTON

BOOKS, PAMPHLETS, ETC., RECEIVED.

FOWNES' MANUAL OF CHEMISTRY. Vol. II. CHEMISTRY OF CARBON COMPOUNDS. 12th. ed. Revised and enlarged, by H. WATTS, B.A., F.R.S. London. Churchill. 1877. From the Publishers.

THE CALENDAR OF THE YORKSHIRE COLLEGE, LEEDS, for the 4th. Session, 1877–8, and the PROSPECTUS OF THE LEEDS SCHOOL OF MEDICINE.

Notes and Queries.

Mr. R. Goodwin Mumbray writes to say that he finds the best thing to preserve leeches is the addition of about a teaspoonful of salt to five gallons of water, and that during a very trying summer, when "all the leeches in the town were destroyed," his kept perfectly healthy and remained so many weeks with change of water.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE CONFERENCE GRANTS.

Sir,—I quite agree with Professor Attfield that it is not only desirable but necessary that discrimination should be practised with regard to the questions and papers which are to receive assistance from the funds of the Conference, and to be recognized at the meetings.

What I regret is the abrupt manner in which the Conference, as represented by the Senior General Secretary, has thought proper to indicate its altered views in connection with the particular cases to which I referred in my last letter. In the report of the Executive Committee, published in the last 'Year-Book,' as having been read at Glasgow, I read that, "On the motion of the President it was resolved unanimously to grant to the gentlemen named the sums mentioned; to thank them for undertaking the several researches, and to request them to communicate results," etc. In the report of the same Committee read at Plymouth, I find similar expressions of satisfaction, not only as regards the fact that grants have been awarded, but also apparently with the nature of the work undertaken.

I trust that in future a more strict censorship over the papers that are presented will be exercised by the publication Committee, so that no communications likely to prove unacceptable to pharmacists may find their way into the general meeting. The assembled members will thus be spared a trial of patience, and misguided authors the risk of discomfiture by an official reprimand.

WILLIAM A. TILDEN.

Sir,—I appeal to your sense of fairness to allow me to make a personal statement in reference to your leader of last week on the Conference papers. Whether the murmurings of discontent at their too scientific character, which you state have of late been floating in the pharmaceutical atmosphere, are tangible or not, I do not now discuss; and, if tangible, whether those murmurings are or are not worthy of official notice, I will not just now consider. But tangible, or intangible, important or unimportant, you are entirely in error in associating my name with them. Respecting one paper, and one only, read at the Plymouth gathering, I said that such investigations, that is future investigations like that one, might be supported by grants from the new funds of the Chemical or Royal Societies or by the British Association, rather than by the Conference, at all events for the present. And in my letter, which appeared in the same number as your long editorial, to make my meaning very plain, I expressly stated that amongst such investigations I did not include any like the aconitine researches or any of the character of most of those on the essential oils; in short, that I did not allude to any research, even highly chemical research, which (by its title or by remarks made by the applicant for the grant) offered promise, even promise of pharmaceutical application. That perception which detected murmurings floating in the pharmaceutical air should have seen that remarks which did not apply to the more highly chemical papers just mentioned did not apply to those you enumerated. I suggested that for the present the Conference should discontinue grants in aid of such purely chemical investigations as one particular investigation I alluded to, and which, though an excellent paper, was, I think I may say, devoid of pharmaceutical interest; you, in your leader, make me apply that suggestion to chemical investigations which most assuredly have pharmaceutical interest. How you could make such a mistake I do not understand, especially in view of my unceasing endeavours to keep up the scientific character of British pharmacy—largely by means of my position as one of the four founders of, and the Senior Honorary Secretary, during its whole life, of the British Pharmaceutical Conference. It pains me thus publicly to allude to my labours, but nothing will so well show the nature of the charge you bring against me; were that charge true, I should be stultifying myself after fifteen years of effort for the advancement of pharmacy—effort which has, I hope, at least been consistent.

It is apparently necessary for me to add that my remarks at Plymouth were not intended to have, and cannot fairly be made to have, the slightest retrospective application—not even to the paper on oil of sage, though they were more appropriately made after the reading of that paper than at any other time of the meeting. I mean to say that the Conference, with the best of pharmaceutical intentions, might possibly devote money to a research which might result only in a contribution to abstract chemical science. Such a disappointment might involve no blame to either grantor or grantee. The remarks were intended chiefly for the purpose for which alone you yourself more or less commend them, namely, "as a useful hint to future intending contributors." As for the promotion of abstract chemical science, grand though such an object is, and strongly as I elsewhere support it, I contend that it should not be, and I would venture to inform you that it never has been among the objects kept in view by the Conference. You notice the appeal that was made to scientific chemists to join the Conference and accept grants, but you do not say that the appeal was to scientific chemists "interested in pharmacy."

JOHN ATTFIELD.

Ashlands, Watford, September 26, 1877.

P.S.—You have twice told your readers that my own Conference paper was "published" before. The kinder word would have been "printed." I stated in the paper that the work was done for the Admiralty Committee on the Arctic Expedition. Of course the report of that Committee was presented to Parliament in a printed form. The Conference enabled me to rescue the paper from "Blue book" obscurity.—J. A.

T. P. Iliffe and H. S. Brathwood.—Your letters have been forwarded to the publishers.

G. Welborn.—Your paper shall appear as soon as possible.

W. Gabitis.—Orders for journals should be sent to the publisher to avoid delay. Your communication has been attended to.

G. Andrew.—The sale would be illegal if the article contained a poison within the meaning of the Act.

"*Syrupus.*"—(12) *Campylopus flexuosus.*

S. V. Holgate.—Polygonum hydropiper.

"*Natura.*" —*Geranium pratense; Apargia hispida; Centauria nigra; Knautia arvensis; Equisetum arvense; Lotus corniculatus; Atriplex patula.*

***** Owing to the pressure of matter requiring immediate publication, we are compelled to defer the insertion of several letters and other communications.**

COMMUNICATIONS, LETTERS, etc., have been received from A. T. Green, J. J. O. Evans, W. R. Sneyd, Tho. Parker, Jno. T. Windle, T. G. Jones, Felix Stevens, G. H. Storey, H. S. Newzam, T. Wallas, R. O. Fitch.

The Pharmaceutical Journal.

SATURDAY, OCTOBER 6, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal. MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE INTERNATIONAL MEDICAL CONGRESS AND THE UNIVERSAL PHARMACOPŒIA.

ALTHOUGH in the programme of the International Medical Congress, just concluded at Geneva, it was not disclosed that any subject presenting points of special interest to pharmacists would be discussed, it appears that the proposition for the creation of a "Pharmacopœia Universalis" attracted a considerable amount of attention and consideration. The result has been that once more this difficult work has been taken in hand, and certain fundamental principles upon which it is to be constructed have been agreed upon. Whether this latest effort will be attended with any greater measure of success than has followed upon the endeavours of the International Pharmaceutical Congress, the Commission of the Paris Société de Pharmacie, or the more private work of Dr. PHOEBUS and his colleagues, remains to be proved, but it is important to find that at a congress attended by above three hundred and fifty medical gentlemen from all parts of the world, the conclusions arrived at as to the desirability of having such a pharmacopœia, and the nature of it, are virtually the same as those of the international congress of pharmacists held at St. Petersburgh in 1874.

It is, indeed, claimed that what has been done by this Congress constitutes a real step in advance. This, however, is not at all evident. All that has now been done—and more—has been done before by other bodies. The desirability of having a universal pharmacopœia has been voted more than once; certain principles for the regulation of its construction have been drawn up; commissions have been appointed to carry out the work; and we believe that even schemes for some sections have been sufficiently matured to be placed in the printer's hands. Yet all this has been to such little purpose that it appears from the report before us it has now been thought necessary to start again *ab initio*. In our opinion it would have been wiser, and there would have been no loss of dignity, had the medical congress, instead of acting independently, taken steps for facilitating united action with the International Pharmaceutical Congress at its next meeting, which will be probably held at no very distant date in London.

However, the International Medical Congress has preferred to appoint another commission, consisting of five medical men and three pharmacists, to carry out its wishes. The medical members are Dr. WILKINSON, President of the British Medical Association; Dr. MARION SIMS, late President of the American Medical Association; Dr. SEGUIN, New York; Professor GUBLER, Paris; and Dr. PACCHIOTTI, Turin. The pharmacists are, Professor GILLE, Brussels; Mr. MADSEN, Copenhagen; and Professor BRUN, Geneva. The first duty allotted to these gentlemen appears to be to impress upon their respective governments the advantages of nominating official delegates to represent each country upon the Commission. It would have been as courteous, perhaps, to have waited until these delegates had been appointed before deciding so definitely upon the details of the work. How far this Commission is to proceed as at present constituted does not appear, but it is not impertinent to remark that a Commission can hardly be said to be representative of pharmacy whilst it includes no pharmacist from Great Britain, Germany, France, or the United States.

The principles adopted by the Congress as those to be followed in this projected pharmacopœia are formulated in fourteen articles, which may be recapitulated as follows: The International Pharmacopœia is to be written in the Latin language. The metric system of weights and measures is to be adopted. Temperatures are to be indicated on the centigrade scale. At first, only energetic medicines are to be included. The names of compounds, chemical or otherwise, are to be made as simple as possible. The minimum of active principle which the more important drugs should contain is to be rigorously fixed. The maximum of impurities that each chemical product should contain is to be indicated. Instruments used in medicine and in surgery are to be numbered, and graduated in a uniform manner. These articles are closely in accord with the recommendations adopted by the International Pharmaceutical Congress at St. Petersburgh; neglect to secure common action would appear therefore the more to be regretted. But perhaps the Medical Congress may see fit to repair this apparent oversight at its next meeting in 1879.

Whilst referring to the subject of pharmacopœias we may remark that we learn from Rome that the Commission (of which the Senator CANNIZZARO, Professor of Chemistry in the University, is chairman) for the compilation of the new Italian Pharmacopœia held its first sitting on the 2nd inst. at the Ministry of the Interior. His Excellency, the Minister (Baron NICOTERA) represented to the Commission that there was a general desire, which he fully shared, that the work confided to it should be brought as speedily as possible to a termination, in order that the new pharmacopœia might receive the revision of the Superior Council of Health, with a view to its being incorporated in the bill for the reorganization of the sanitary service which the Minister of the Interior intends to submit to Parliament a few days after the opening of the session.

THE AMERICAN PHARMACEUTICAL ASSOCIATION.

On the 4th of September this Association held its twenty-fifth Annual Session in the City Hall, at Toronto, Canada, this being the first time it had met upon British territory. We understand that the attendance was not quite so numerous as it has been on some previous occasions, but this is hardly to be wondered at, considering the enormous distances that some of the members would have to travel to be present. On the whole, however, the meeting, which lasted four days, appears to have been very successful. The papers, which we hope to refer to more fully on a future occasion, were fairly plentiful, pharmaceutical and good, and the hospitality of the Canadian pharmacists evidently made a very pleasant impression upon the visitors. The only approach to unpleasantness appears to have been a few mutterings of the storm that is still raging as to the preparation of future editions of the United States Pharmacopœia.

Unlike our own Conference, in which hitherto every President has presided over two complete sessions, the American Association usually indulges in two Presidents at each gathering. On the first day the present meeting was called to order, and presided over by Mr. Bullock, of Philadelphia, who also presided over the latter portion of the meeting last year in that city. In the course of the second day, Mr. William Saunders, of Ontario, Canada, was elected the new President, to whom Mr. Bullock at once gave place. The new President, who is Vice-President of the Ontario College of Pharmacy and an Honorary Member of the British Pharmaceutical Conference, is said to be a Devonshire man. The Association also re-elected Professor Maisch to the post of Secretary, which he has filled for so many years.

It was reported that the membership of the Association numbered 1160, against 1066 at the previous meeting. The receipts during the year had amounted to 6514 dollars, the disbursements to 5559 dollars, leaving a balance in the treasury of 954 dollars. A balance left from last year in the hands of the Centennial Entertainment Committee was offered, on conditions, as a nucleus for a scientific research fund.

An important feature in connection with this meeting was a conference between the representatives of the teaching pharmaceutical colleges present, in which an understanding was arrived at as to the standard to be adopted for matriculation, and upon various other subjects of a similar nature. On more than one occasion the want of uniformity of action by the various colleges has been the occasion of jealousy and consequent discord at the Association meetings, which it may be hoped will now be avoided.

The next meeting of the Association is to be held in Atlanta, Georgia, on the 3rd of September, 1878.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, October 3, 1877.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atherton, Atkins, Betty, Bottle, Brown, Churchill, Gostling, Greenish, Hampson, Hanbury, Hills, Mackay, Owen, Rimmington, Robbins, Sandford, Schacht, and Shaw.

The minutes of the previous meeting were read and confirmed.

Election of Women to Membership.

The first application for membership considered was that of Miss Isabella S. Clarke. The President inquired if any member of the Council would move the election of this lady. He said no doubt Mr. Hampson would have done so, but he had not yet arrived.

The Vice-President said he should be happy to do so.

Mr. Churchill said he would support the motion.

It was subsequently proposed by Mr. Gostling, and seconded by Mr. Churchill—

"That Miss Isabella S. Clarke, a pharmaceutical chemist, be elected a Member of the Society."

Mr. Robbins did not think the question could properly be brought forward until the former vote had been annulled.

The President said a former Council had no doubt refused to elect Miss Clarke a member, but he could not see that that bound the present Council.

Mr. Robbins said he referred to the vote of the general meeting of the Society.

The President thought the Council had nothing to do with the vote of a general meeting.

Mr. Sandford begged to be pardoned for saying that it was a vote of the Society, and he did not see how the Council could elect a lady as a member until that vote had been reversed.

The President said that fact would no doubt weigh with members of the Council, but he did not see that they were bound by it.

Mr. Bottle said he should always feel bound to carry out the views deliberately expressed at a general meeting.

Mr. Betty thought it was a fundamental principle of the government of the Society that certain matters of importance were referred to general meetings, and of course the Council was bound by the decision of the meeting. He did not see how the Council could go in the face of its constituents, and elect a lady as member until the vote had been formally reversed.

The President said the Council had the power in its own hands; it was merely a matter of courtesy taking the opinion of the general meeting on a question of this sort. He did not see that the present Council was bound by a decision arrived at some years ago, and it was very likely if the matter were placed before a general meeting again a different conclusion would be come to.

Mr. Betty repeated that this matter came before the general meeting in the most formal way from the Council itself; it was not raised incidentally by an individual member.

Mr. Gostling said that as he found the matter had been discussed and decided by a general meeting he must withdraw his motion until the question had again been referred to the Society.

Mr. Churchill also thought it would be better not to proceed further until the question had again been put before the members of the Society. He therefore withdrew from seconding the motion.

Mr. Greenish said he would support the election.

Mr. Bottle said he would move as an amendment, that the matter be referred to a special general meeting.

Mr. Gostling seconded the amendment.

The PRESIDENT ruled that this must be put as a separate motion, and it was subsequently dropped.

The election of Miss Clarke as a Member was then moved by the Vice-President, and seconded by Mr. Greenish.

Upon a division, four voted for the motion and eight against it. The motion was therefore lost.

ELECTIONS.

MEMBER.

Chemist and Druggist.

The following registered Chemist and Druggist was elected a Member of the Society :—

Parrington, William .... Batley.

ASSOCIATE IN BUSINESS.

Henry Patrick Taylor, of London, having passed the Minor examination, being in business on his own account, and having tendered his subscription for the current year was elected an "Associate in Business" of the Society.

ASSOCIATES.

The following having passed the Minor examination and having tendered or paid (as apprentices or students) their subscriptions for the current year were elected "Associates" of the Society :—

Pike, John........................... Yarmouth.
Todd, Matthew James............ Sunderland.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary examination and tendered their subscription for the current year were elected "Apprentices or Students" of the Society:—

Budden, George Alfred .... Wareham.
Chipchase, Charles Herschel ... London.
Collis, William Blow .... Arundel.
Cox, John Goodwin............... Bridport.
Hudson, James..................... Harrogate.
March, Richard .... Stamford.

The names of the following persons were restored to the register of Chemists and Druggists :—

John Lowe .... 294, Old Kent Road.
Charles Spicer...72, Penton Place, Newington Butts.

Seven persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

REPORTS OF COMMITTEES.

FINANCE.

The report of this Committee was received and adopted, and sundry accounts ordered to be paid.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants :—

£20 to one of the founders of the Society, aged 74, and suffering from incurable disease.

£10 to the widow of a pharmaceutical chemist and member—sick, and without hope of recovery. Applicant had a similar grant in February last.

£5 to a former member of the Society, aged 59, suffering from chronic rheumatism; he received £5 in December, 1876.

£5 to the widow of a chemist in business for forty-two years. Applicant had a grant of £10 in April last.

£52 10*s.* to be placed in the hands of Mr. Owen for the purpose of obtaining the election of an orphan boy, aged 7½ years, one of seven children of a registered chemist and druggist, to St. Anne's School.

£10 to a pharmaceutical chemist and former member, residing in Ireland, now earning a small salary as a clerk, and in distress from illness. Applicant had a grant of £10 in October 1873.

£10 to the widow of a chemist and druggist in business on his own account for many years.

Mr. BETTY drew attention to the proposed grant of fifty guineas, and suggested that a smaller sum should be given. He did so because the Committee had been equally divided on the question, which had been decided by the Chairman's casting vote. Considering all the circumstances of the case, especially the age of the child, he thought it would be well to reconsider the amount.

The PRESIDENT explained why he had supported the proposition. He thought it a case in which the Society would do well to secure the election of the child. He did not think it was desirable to give a small sum which might not be effectual, and on the other hand, if the desired object could not be ensured, Mr. Owen would not expend the money at all.

The VICE-PRESIDENT moved that the grant should be thirty guineas.

Mr. SCHACHT pointed out that the whole amount need not be expended if it were not necessary.

Mr. HAMPSON argued in favour of the amendment.

Mr. GOSTLING supported the original proposition.

The matter having been further discussed in detail the amendment was withdrawn and the report and recommendations of the Committee were agreed to.

LAW AND PARLIAMENTARY.

The report of this Committee included reports from the Solicitor of the progress of various cases which had been placed in his hands. The Committee also recommended that proceedings be taken in a case of alleged infringement of the Pharmacy Act, the particulars of which had been elicited by the action of the Chemists and Druggists' Trade Association in a prosecution reported in the *Pharmaceutical Journal* of the previous week (p. 257). A homœopathic chemist, who had used the title of "pharmaceutist" on his labels and over the shop, had paid the penalty incurred by his breach of the law, and promised to discontinue doing so in future. He had been warned on a previous occasion. Another question which had been before the Committee was that of prosecuting in the case of using methylated spirit for the preparation of tinctures, such as that of opium. On this point some discussion ensued preliminary to the adoption of the report.

Mr. GREENISH said instances had come before the Committee on several occasions of laudanum being prepared with methylated spirit. There seemed some doubt whether a conviction could be secured under the Pharmacy Act, but there was not the least doubt that the offender was liable to a penalty of £100 under the excise laws, and the question was whether the Council ought not to bring the matter before the revenue authorities. It was very unfair to an honest tradesman that he should be undersold by an unscrupulous neighbour who used methylated spirit for making tinctures for internal use.

Mr. BROWN said there was too much reason to believe that this practice was far from uncommon. He did not wish the Society to take the position of a common informer, but he thought it might be the duty of the Society to send a communication to Somerset House calling the attention of the authorities to the matter.

The VICE-PRESIDENT said there was no exclusive privilege granted to the Inland Revenue authorities; any one could prosecute in such a case.

Mr. OWEN remarked that it might lead to many vexatious visits by revenue officers to respectable chemists if the authorities were appealed to.

Mr. RIMMINGTON thought the excise authorities should have their attention drawn to this matter. It placed the honest tradesman in a very unfair position.

The PRESIDENT said it would open up a very large question if the Society became a public prosecutor for adulteration.

Mr. ATKINS hoped the Council would pause before setting the authorities to work in the way of exercising a more complete system of espionage than already existed.

After some further conversation on this subject the report was received and adopted.

The Benevolent Fund.

The discussion (adjourned from August last) was resumed on the following motion by Mr. Robbins:—

"That the benefits of the Benevolent Fund be further extended by making a provision for the orphan children of deceased members or associates of the Society, according to the intention of the founders as expressed in the Charter of Incorporation.

"That the surplus income derived from subscriptions be appropriated to the benefit and advancement of such children by the purchase of admissions into orphan institutions, or in any other way the Council may deem desirable.

"Candidates for admission by purchase to be nominated by the Council. The election to be by voting papers, and to take place at the same time and in the same manner as the election of annuitants."

Mr. Betty, in opening the adjourned debate, said he objected strongly to every paragraph in the motion. He considered it unnecessary, incongruous, impolitic, and unwise. With regard to the first paragraph he could only say that the object aimed at was already attained. There had been an instance that day in which a large sum had been voted by the Council for this object. If the second paragraph were carried the action of the Council would be hampered exceedingly in the administration of the fund, and he had yet to learn that the action either of the Council or Committee was open to any complaint. In no instance had a deserving case come before the Committee and been put on one side, and he saw no reason, therefore, why a hard and fast line should be laid down as to what should be done with the surplus. He thought it would be impairing their liberty of action in a way which neither the charter nor the wishes of the founders intended. Again, the last paragraph was the very climax of undesirableness. Under the guise of giving charity the Council would be putting these unfortunate applicants to the extreme trouble of an election. If there were one thing more than another in the action of the Benevolent Fund which required the serious consideration of every member, it was how to distribute the fund on grand charitable principles, not in accordance with electioneering practice. If the present evils of elections could not be put down, at any rate they should not be added to. He could mention a case known to himself in which concerts, a lottery, and every kind of device had to be used to get a boy into one of these orphan asylums.

Mr. Owen thought the case mentioned by Mr. Betty, in which fifty guineas had been granted, was a very excellent one. According to his experience, it required a great deal of hard work and earnest endeavour, besides no small amount of tact, to get a child into one of these asylums. At the same time, he agreed with him that this motion was quite unnecessary, and he should vote against it.

The President said all agreed that the benefits of the Benevolent Fund ought to be extended further.

Mr. Betty said he did not agree to the first paragraph of Mr. Robbins' motion.

Mr. Owen remarked that the Council had full power to do all that Mr. Robbins wanted.

Mr. Brown could not see the object of this motion. The operation of the Benevolent Fund had already been extended in the direction suggested, and though the motion might be a proper one to be brought before the Benevolent Fund Committee, it did not concern the Council in its collective capacity. That morning the Council had shown its desire to go in the direction Mr. Robbins wished, and he believed that in the future, without any such motion being adopted, it would continue to progress in that direction, so that it would be quite safe to leave the matter in the hands of the Committee. He could not consent to tie the hands of the Committee in the way proposed.

Mr. Mackay felt very much inclined to oppose every paragraph of the motion, sharing the feelings already expressed by other gentlemen, that it was totally useless, and he hoped, therefore, it would be withdrawn. If Mr. Robbins had been a new member, without experience, he could have understood his bringing forward such a motion, but, looking to the past and present, he felt sure he must have entire confidence in the procedure of the Benevolent Fund Committee for the future, and he failed entirely to see how, if this motion were adopted, it would confer greater power on the Committee than it had at present. The Committee already gave full attention to every case that came before it.

Mr. Hampson thought some gentlemen were rather hard on Mr. Robbins, for his object was a very good one, but he disapproved of his motion nevertheless, mainly from the fact that it would extend the already vicious system of voting and touting for votes. He would rather the Society bought admissions at once, if it took any step in that direction, than throw the turmoil, discord and expense of electioneering on those whom it wished to aid.

Mr. Hanbury thought what was new in the motion was objectionable, and what was not new was naturally superfluous.

Mr. Atherton agreed with Mr. Mackay, and thought the Council might have every confidence in the Committee which distributed the Benevolent Fund. At the last sitting the Committee gave away more money than it had ever done before.

Mr. Robbins said the bringing forward of this motion had already done a great deal of good, and he did not see why he should be taunted with having done so, and be told of what had been done yesterday, or that morning, when in fact his motion was brought forward two or three months ago, and it was only since then the Committee had given away eighty guineas for the benefit of orphans, which had never been done before. At the commencement of the Society the founders could not do all they intended to accomplish in the future, and therefore contented themselves with giving only grants of money to those in distressed circumstances. Time went on, and after more than twenty years they began to provide for annuitants, and so they had gone on up to the present time, providing for annuitants and casual grants, but as yet there had been no regular provision made for orphan children. No doubt provision was made for orphans in the regulations of the fund, but according to the reading of these regulations it appeared to be only for those who had lost both parents and were in completely destitute circumstances, and his motion did not apply to those. His object was when a poor woman, who formerly occupied a respectable position, was left with a large family she should be assisted to place one or more of her children in a good school.

The Vice-President reminded Mr. Robbins that seven or eight years ago £100 was given to a school for this very purpose.

Mr. Robbins said this idea had been acted on once, showing that what he now proposed had been considered by the Council at a former time the proper thing to do, but he wished to see it done oftener, as he considered the fund could not be applied to a better purpose. He did not insist upon the third paragraph, but if the Council were going to provide for orphans in the future it would be necessary to draw up some rules, for at present there was no form for such cases. The case which came before the Committee on the previous day would never have arisen but for his motion.

The President remarked that it came before the Committee six months ago.

Mr. Robbins said Mr. Sandford had stated that it was absurd to talk of the surplus income; if that was so he would call it excess of income over expenditure, which came to much the same thing. Going back to the year 1868, he found that in one year only had this surplus sum been less than £500, and he considered that with this money some special provision should now be made for orphan children, and if the Council were going to do so it must come to some decision on the matter. Other societies, with no better income, made more provision for orphans; and he contended the Pharmaceutical Society ought to do the same.

The PRESIDENT said that Mr. Robbins' reading of the word "orphans" in the regulations was not correct as applying only to children who had lost both parents.

Mr. ROBBINS said there was no form provided in which application was to be made in the case of orphans. However, he had no objection to withdraw his motion as he had the satisfaction of knowing that his object, to a great extent, had been attained.

Mr. SANDFORD said the case already referred to in which an orphan child had been provided for was not the only case of the kind. Others had occurred long before Mr. Robbins was a member of the Committee. The whole machinery was ready to their hands; they only had to carry it out.

The motion was withdrawn.

TRAVELLING EXPENSES TO COMMITTEES.

Mr. SCHACHT next moved the following resolution, of which he had given previous notice:—

> "That the members of Council resident in the provinces be reimbursed their travelling expenses incurred in attending meetings of the Committees other than those on the day preceding the Council meetings."

Mr. SCHACHT said that the grounds on which he thought it right to give this notice of motion were quite simple. The work of the Society was very various, and for its proper fulfilment it was divided into sections for dealing with which committees were appointed. He thought it was desirable that the gentlemen constituting those committees should not be taken from one portion of the Council only, but should include in all cases gentlemen who were as variously circumstanced as could possibly be. As some committees met in the middle of the month, gentlemen living in the country were handicapped by the amount of their travelling expenses; if, however, there should appear on the face of things anything like an attempt to raise a difference between country and town members he should be prepared to show that he had no such desire by proposing that all members of the Council should be paid their travelling expenses of attending the meetings. He knew of no objection except that it might cost the Society so much more per annum, but the amount would be very small as compared with the large amount which individual members were sometimes called upon to pay.

Mr. BROWN seconded the motion.

Mr. MACKAY asked that Mr. Schacht would name the committees on which he thought it imperative that members from the country should sit in the middle of the month. As far as he knew, the principal committees were the Benevolent Fund, the Finance, and the Law and Parliamentary, and it seemed to him a far better way for the members of the Council to come up the day previous to the Council meeting than in the middle of the month. If a positive necessity for meeting in the middle of the month could be shown it would be a different thing.

Mr. BROWN said he had seconded the motion in the hope that if it were adopted it might bring about what he had long and earnestly desired, the more frequent meeting of the committees. He believed that great advantage would result from the Parliamentary Committee meeting in the middle of the month, because there were a great number of questions coming before the Council on which a considerable time was spent. Sometimes questions came up which it was not desirable to discuss in public, but he had a great objection to the suppression of any portion of their proceedings in Council, and, with that view, some years ago a General Purposes Committee was instituted, but had not fulfilled its duties, simply because it had not had time to do so. It was held late on the evening preceeding the Council, when all the other business had to be done, but if more time could be given for that a great deal of unnecessary discussion in Council would be avoided and the Law and Parliamentary Committee, which he believed would for some time to come be the most important committee in connection with the body, might meet in the middle of the month. It ought to be known that country members had to spend a great deal of money, as well as time, in attending the Council meetings, which they were never reimbursed.

The PRESIDENT remarked that the Parliamentary Committee consisted of the whole of the Council.

Mr. GOSTLING thought it was most undesirable to multiply committee meetings for the benefit of country members. If it were desirable to have more country members on the committees it would be better to have three committees on the day previous to the Council rather than come up in the middle of the month. He quite agreed with Mr. Schacht that if the work was necessary country members should be reimbursed their railway expenses; but as the important Committees were generally held the day before the Council meeting it seemed to him almost unnecessary that such a motion should be passed. He should therefore be obliged to vote against the motion, though he agreed with the spirit of it.

Mr. BROWN asked leave to add one thing he had forgotten with reference to meetings in the middle of the month. The Benevolent Fund Committee was held on the day previous to the Council meeting and had a number of cases brought before it. He had repeatedly advocated inquiries being made with reference to the applicants, and if this committee could be held in the middle of the month, the subject of the grants and the names would come before the country members, and they would have an opportunity of inquiring into the cases before the question was brought before the Council.

Mr. BETTY said Mr. Brown's last argument seemed to be that if the Benevolent Fund Committee met in the middle of the month, its duties would be more efficiently performed. Now, he might remind Mr. Brown, who had not the opportunity of frequently attending the meetings of this committee, that every case which came before it was fully considered and not decided on without ample evidence. The general question as to payment of the railway expenses of country members was a large one, and one which no one had had the courage to bring forward for many years. On many occasions he had had to admire the originality and boldness of Mr. Schacht's views, and it was certainly a bold thing to advocate an increase of the Society's expenses in paying themselves. He did not wish the matter to be looked at in a narrow spirit, but as it affected the Society financially, politically, and practically. He found the expenditure incurred last year for the travelling expenses of members of Council was £244, in 1873 it was £331; so that the expenses had not been increasing, as he supposed, but still that was only an additional reason for persevering in the same course of economy. The majority of members lived in the country, and this motion would enable them to come up more frequently, but would cause large expense to be incurred. The one committee which met in the middle of the month, the Library, Museum and House Committee, was a comparatively unimportant committee, being essentially one of administration. It might happen, if this motion were carried, that the expenses of this committee would amount to upwards of £200 a year. The position of members of Council had hitherto always been looked upon as honorary and honourable, and they ought to hold by the old traditions of the Society, according to which members of Council were the representative men of the trade, to whom a few pounds a year more or less was not of much importance, but who came there as public men not contented to shine, however brilliantly, in their own neighbourhood, but desirous also of taking public part in proceedings in London. It was a question now whether they should abide by these old traditions or should make it a matter of pounds, shillings, and pence. He hoped the old feeling still existed, and that the Council would pause before adopting this motion. This was as to the financial part of it. Then as to what practical end would be attained. It was merely to enable certain gentlemen to come from the country to attend one committee in the middle of the month which was made as uninteresting and dull as possible. It was occupied some three or four hours, not with questions of policy or principle, but whether a few mops, more or less, should be ordered for the basement, whether a ventilator should be opened or shut, whether certain books should be ordered for the Library, and to hear formal reports from the Professors; whilst once a year members went over the house to see where the paint was rubbed off, and so on. That was the main business of the committee, and if the Council paid £200 or £300 a year for gentlemen to come from a distance to attend it, he would ask whether the best interests of the Society were really being consulted. Then the question was put forward whether the Law and Parliamentary Committee should meet in the middle of the month. Did the Council believe that if the Parliamentary Committee were summoned twice a month there would be one member less, or more, in attendance simply by paying the railway expenses of those who attended? He asserted, however, that one meeting in the month was ample, at least under present circumstances, and that the day before the Council meeting was the best time to hold it because then the matter came before the Council fresh in their recollection. They had no proof that more business was brought before the committee than could be dealt with. He knew Mr. Brown had a grievance that the General Purposes Committee did not do its duty, and whenever any proposition came forward for any reform in the arrangement of the committees he urged that the General Purposes Committee was not fulfilling its functions. With that he agreed, but the way to get over the difficulty would be, if the Library and Museum Committee had any business other than that of the most formal character brought before it, that a special meeting of the General Purposes Committee should be convened, and that it should come before that committee before being submitted to the Council; every member would then be present and would have an opportunity of reviewing the work done by the committee in the middle of the month. In conclusion he saw no reason why this extra expense should be thrown upon the Society.

Mr. Atherton said as he understood Mr. Schacht's proposal it was simply this, that if any member chose to be a member of a committee meeting in the middle of the month he should not have to pay his own railway fare in attending. So far he should go with Mr. Schacht entirely, but if he thought by carrying this motion there was to be a compulsory attendance on committees twice a month, he should most certainly vote against it, because it would be most inconvenient to country members to be summoned twice a month.

Mr. Hampson said it would have been desirable if Mr. Schacht in introducing this question could have shown the necessity for committees meeting twice a month, or for some other arrangement than the existing one, and he thought the question had better be deferred until the rearrangement of the committees, when it could be seen exactly how the committees would work. If it was desirable that the Law and Parliamentary Committee should meet in the middle of the month any country member attending it should most decidedly have his railway expenses paid. He certainly had an impression that such a change would be desirable, because he had frequently attended a committee on the day before the Council and found one committee treading on the heels of another and there was not always as much time as could be desired for the business to be efficiently conducted.

Mr. Mackay asked whether Mr. Schacht wanted all the committees to meet in the middle of the month, or that one committee should be selected to meet at that time.

The President said the motion was simply that the country members on a committee which met in the middle of the month should have their railway fare paid: it did not contemplate any change in the committees.

Mr. Shaw said the circumstance which gave rise to this motion was that a year or two ago a complaint was made that on the Library, Museum and Laboratory Committee no country member's name was placed, and it was suggested that some member from the country should be put upon the committee, and it was also suggested that those who did take special interest in educational matters should be appointed. That was taken into consideration, and this year Mr. Schacht was appointed on the committee; under these circumstances, if the Council thought it desirable that a country member should be appointed to sit on a particular committee, it was only just that his railway fare should be paid. He did not think it desirable that the Parliamentary Committee should meet in the middle of the month. That committee comprised the whole of the Council, and he thought it very important that as many members as possible should be present at its meetings, because matters came before it frequently on which local knowledge was very desirable. The same consideration applied to the Benevolent Fund Committee.

Mr. Atkins thought a great deal of irrelevant matter had been introduced into this discussion; the question was simply whether those who came up to committees should have their railway fare paid; and if the larger question of rearranging the committees was raised it was a totally different thing, on which he should like to hear a great deal said before coming to any decision, and should therefore have been prepared to move that it be referred to a committee for full consideration. He hoped it would be distinctly understood that country members were not paid, and that the references made to the good old times and old traditions when men came there simply from pure love of the Society and their kindred were as applicable now as they ever were. But if country members had to make large sacrifices of their time, the least they could expect would be to have their railway fare reimbursed.

Mr. Sandford thought there could be no doubt that the question of the rearrangement of the committees would come up if such a resolution were passed. They all knew the inconveniences arising from cramming nearly all the committee work into the day previous to the Council, and if this proposition were passed the ground for this arrangement would be entirely removed and it would be right, he thought, to fix the meetings at some reasonable time in the course of the month, as was now the case with the Library, Museum and Laboratory Committee, which committee, by the way, he had been very sorry to hear one gentleman characterize as unimportant. He did not see how that could be said when Mr. Schacht had been continually told that committee was so important that it must meet in the middle of the month. He, therefore, thought the matter should be referred to a committee, because this larger question was intimately mixed up with it, and if Mr. Atkins would move such a resolution he would second it.

The President thought this should be a separate motion.

Mr. Hampson submitted that if Mr. Schacht's motion were referred to a committee, only the question of the payment to members could be discussed, and the committee could not take into consideration the further question of the rearrangement of the committees.

Mr. Sandford said he thought it desirable that Mr. Schacht's motion be referred to a committee which should consider it in all its bearings, especially as to the effect it would have in facilitating the sitting of country members on committees.

Mr. SCHACHT hoped the simple proposition he had brought forward would not be mixed up with anything else. If it were carried it would then become of necessity the duty of the Council to consider or refer it to some committee to consider what rearrangement of committees should take place.

After some further conversation as to the propriety of putting the amendment,

Mr. SCHACHT replied: He thought that neither the London members nor the country members as a section should be left to do anything by themselves, but that the committees should be taken from the entire Council. He was never more astonished than when he heard that his proposition was a bold one; it would seem to him the simplest possible expansion of the acknowledged system. Up to a certain point it was understood that gentlemen living in the country should not pay their own travelling expenses when attending to the Society's business, and it was not fair to characterize the increase of £5 or £10 which might be made, to the immense amount of £244, mentioned by Mr. Betty, as a payment to country members. What led him to move the resolution was the stir about the appointment of the Library, Museum and Laboratory Committee. He agreed entirely with Mr. Sandford that it was incorrect to describe the work of that committee as being unimportant; on the contrary, a wish had been expressed more than once that he himself should be placed upon it. Up to the present time he had not been able to afford a second journey to London per month on the Society's business, but during the last year he had allowed his name to be included, and he believed the work done by that committee was of a very important description. But he did not see why he should have to pay the travelling expenses in attending that committee any more than when attending the Council, it being equally the Society's business. If the frequency of the committee meetings was thought desirable to be discussed let it be so, but it was a matter quite apart from his motion.

Mr. ATKINS having seconded the amendment proposed by Mr. Sandford, several members expressed their opinion that it was not, strictly speaking, an amendment to the proposition, and ultimately it was withdrawn.

Mr. BETTY said he considered this as a matter which appealed directly to the country members, and, as a London member, he should leave the matter in their hands.

Mr. SCHACHT said he would withdraw the proposition if there was a general feeling in the Council that it was desirable to modify the arrangements of the committees, but it was the first time he had heard such an opinion.

Mr. HILLS said he had been for seventeen or eighteen years a member of the Council, and he had never known any business slurred over, or done improperly. Although he lived in London, he had the interests of the country members at heart as much as any one else. He was neither for the country nor for London, but for the Society at large. He should like to see gentlemen residing in the country on the committees, but he should decline voting on this question.

The PRESIDENT also said the question had become rather a delicate one, and he should himself prefer not voting upon it, and probably many London members would feel the same.

Mr. SCHACHT said he had brought forward the motion from no selfish motives whatever, and he hoped if gentlemen did not agree with it they would vote against it.

Mr. RIMMINGTON said he did not see how country members could vote if London members abstained.

Mr. CHURCHILL expressed the same view.

Mr. SCHACHT said under such circumstances he must withdraw the motion.

Mr. ATKINS thought Mr. Schacht had only acted with becoming dignity. He was perfectly surprised to hear the remarks which had been made, and he thought no one living in London had a right to make such observations. It would be a great misfortune if in that Council they had anything like Guelph and Ghibelline factions.

Mr. BROWN, as seconder of the motion, said he could do no other than agree to the action taken by Mr. Schacht; at the same time, he did it under protest, and thought the motion had not been fairly treated by being made the subject of the antagonistic remarks which tended to create a feeling between London and country members. He was quite satisfied it would not be long before it would be necessary to call more frequent meetings of the Parliamentary Committee, and it was exceedingly unfair to country members that they should be put not only to inconvenience and loss of time, but to expense also.

The PRESIDENT said he would ask Mr. Schacht still to press the motion, and would appeal to all London members to give their votes. He was quite sure Mr. Schacht had no intention of making it a question of town and country members.

Mr. BETTY said if Mr. Schacht would amplify his resolution, to include the travelling expenses of all members of the committee, he should be inclined to reconsider it. At present it looked as if it was a question who should be paid, town or country; and although the expenses of London members were very small, still, if they gave their time,—and on an average town members gave three times as much time as country members—they ought to be all included in the motion.

Mr. BROWN said if Mr. Schacht did consent to take that course he should give notice of a motion for the next meeting that country members should not be reimbursed their travelling expenses when attending the Council meeting. Personally, it made but little difference to him whether it cost him £50 or £100 to be a member of the Council, irrespective of his railway fares, but he looked upon it as a question of principle, and as such it ought not to be imposed on country members that they should be called upon to attend committee meetings at a large loss of time and money, when London members could attend at much less.

Mr. SCHACHT said he had withdrawn the motion and he hoped the discussion would be closed.

PROSECUTIONS UNDER THE APOTHECARIES ACTS.

Mr. SCHACHT then moved the following resolution, of which he had given notice:—

> "That an effort be made by this Society to arrive at a distinct understanding with the Society of Apothecaries as to the class of cases of alleged infringement of the Apothecaries Act which should be open to prosecution; and that a committee be appointed to confer with the Society of Apothecaries to give effect to this resolution."

Mr. SANDFORD suggested that the Council should go into committee on this matter.

Mr. SCHACHT said he did not wish the discussion to take place in committee, and he hoped gentlemen would limit their observations to such as might properly be published. The reason he wished to be the medium of introducing this proposition was that he had found it necessary to give an adverse vote to a proposition to rectify an evil when it had arrived, which he now wanted to prevent. He was one of the minority who had voted systematically against the policy of the Society taking up the defence of gentlemen who, whether rightly or wrongly, were under prosecution on behalf of the Society of Apothecaries, and he was very anxious to introduce this motion in order that it might be seen that it was quite possible for him to give such a vote, and yet be equally anxious to do the best he could for the interests of the trade at large, his belief being that every member of the Council was equally desirous of arriving at such a happy result though they differed as to the processes by which that result could be attained. In this dilemma he fell back on the old maxim that prevention was better than cure; and it occurred to him that seeing the dilemma in which they were placed by the wording of the Apothecaries Act it would be better for some representatives of the Council to have an interview with the representatives of the Apothecaries' Company, and come to some mutual understanding as to the interpretation which should be put upon that Act. It was no use shutting their eyes to the difficulty which existed, a difficulty which was plainly seen by Mr. Baron Bramwell, and he thought it was their duty to try and overcome the incongruities which existed. The next question which arose was, whether there was any chance of success, was it likely that the Society of Apothecaries would meet their request for an interview, and if so, were there any lines they could take as indicating that which should divide legitimate from illegitimate pharmacy? On the former point he did not think the Council had a right to anticipate an unfavourable answer, since it would be an act of discourtesy from one body to another, which was not at all likely to occur; the latter point he admitted was one of great difficulty as to the exact ground the Council itself should take up, but nevertheless there were one or two positions which seemed to him grounded in common sense which it would be only fair to speak of. In the first place, there was a distinct right on the part of the public to go wheresoever they pleased for medicine, or for anything else. No one in the world thought that a person who went to the veriest charlatan or quack for advice was actionable at law, yet it would be extremely difficult to prove logically that the receiver was not just as guilty as the giver. If a person knowing him not to be a medical man, chose to take his opinion on a medical question, if there was any offence at law the person who consulted him was as much to blame as he; the only point of importance being that the person who asked for advice should not be deceived as to the pretensions of the person giving it. This was such palpable common sense that it appeared to him there might be founded upon it some ground for inferring what was the difference between legitimate and illegitimate pharmacy. He thought it would be infinitely better that the Council should endeavour to prevent these difficulties than to defend actions after they were instituted.

The President said the two questions to be considered were whether the Council was likely to be successful in this application, and next, what were the arguments to be adopted by any deputation which might be appointed. The first consideration, of course, was whether it would be wise to attempt it at all.

Mr. Atkins remarked that the last Conference at Constantinople was not very encouraging.

Mr. Bottle said he had brought this matter forward some three months ago, but the feeling of the Council then was that it was not expedient to move in it whilst the Shepperley persecution was still pending.

No member of the Council volunteering to second Mr. Schacht's motion, it fell to the ground.

Chloral Hydrate.

The proceedings in reference to placing chloral hydrate on Schedule A of the Pharmacy Act, 1868, were again deferred.

PHARMACEUTICAL MEETING.

Wednesday Evening, October 3, 1877.

The first Evening Meeting of the Session was held at 17, Bloomsbury Square, on Wednesday last. The chair was taken at half past seven o'clock by the President of the Society, Mr. John Williams.

The minutes of the previous meeting having been confirmed, the following Donations to the Library and Museum were announced, and the thanks of the Society voted to the donors:—

To the Library.—'Year-Book of Pharmacy and Transactions of the British Pharmaceutical Conference, 1876,' from the Conference; 'Chemical Notes for Pharmaceutical Students, including the Chemistry of the Additions to the Pharmacopœia,' by A. Rivers Willson, 1875, from the Author; 'Papers read before the School of Pharmacy Students' Association of the Pharmaceutical Society of Great Britain, 1874—6,' 2 vols. MSS., from the Association; 'Report on the Transport of the Sick and Wounded by Pack Animals,' by G. A. Otis, 1877, also, 'Pamphlets issued in connection with the Exhibit in the Hospital of the Medical Department, U.S. Army,' from the Surgeon-General, U. S. War Department; 'Thirteenth Annual Report of the Alumni Association of the Philadelphia College of Pharmacy,' and 'Fifty-seventh Annual Announcement,' of the College, from the College; 'Proceedings of the American Pharmaceutical Association, 1876,' from the Association; 'Annual Report of the Board of Regents of the Smithsonian Institution, 1875,' from the Institution; 'Calendars of the Universities of London, Durham, and Glasgow, 1877,' from the respective Universities; 'Calendar of the Yorkshire College,' with 'Prospectus of the Leeds School of Medicine, 1877—8,' from the College; 'Selection of Prescriptions,' by J. Pereira, with a 'Synopsis of the Chemical Decompositions that take place in the London Pharmacopœia,' 1822, also, Mead's 'Mechanical Account of Poisons,' 1702, from Mr. F. W. E. Shrivell; 'Rapport sur les Médicaments nouveaux par une Commission composée de MM. Baudrimont, Gobley, Marais, Schaeuffèle, et A. Petit,' also, 'Conservation et Dosage de l'Acide Cyanhydrique,' 'Chlorhydrate de Narcéine,' 'Recherche des petites quantités d'Albumine dans l'Urine,' and 'De la Triméthylamine au point de vue Chimique et Pharmaceutique,' par A. Petit, from Mons. Petit; 'Recherches pour servir à l'Histoire chimique de la Racine de Gentiane, Présence d'un Tannin,' par J. Ville, 1877; 'Etude sur les Térébinthines et Spécialement sur la Térébinthine de Bordeaux,' par A. Fronsac, 1877, from Professor J. L. Soubeiran; 'Beiträge zur Chemie der wichtigeren Harze, Gummiharze und Balsame,' von E. Hirschsohn, 1877; 'Ueber die Alkaloide des Delphinium staphisagria,' von Provisor Marquis, 1876; 'Bestimmung der Alkaloïde in den Chinarinden,' von E. Johanson, 1877: 'Ueber Calcaria phosphorica,' von E. Hirschsohn, 1877, from Professor Dragendorff; 'Disease Germs, their Nature and Origin,' second edition, 1872; 'On Life and Vital Action in Health and Disease,' 1875; 'The Machinery of Life,' from Dr. Beale, F.R.S. (the Author); 'Guy's Hospital Reports,' third series, vol. 22, 1877, 'St. Thomas's Hospital Reports,' new series, vol. 7, 1876; and 'Statistical Tables of the Patients under Treatment in St. Bartholomew's Hospital during 1876,' from the respective Hospitals; 'De l'Usage Thérapeutique de l'Acide Salicylique ses composés et accessoirement de la Salicine,' par W. Douglas-Hogg, M.D.; 'Register, Charters, and Bye-Laws,' etc., of the Royal College of Veterinary Surgeons, from the College; 'The Materia Medica of the Hindus,' by Udoy Chand Dutt, with a 'Glossary of Indian Plants,' by G. King, M.B., and the Author, from the Author; 'Pharmacopêa Portugueza,' 1876, from Señor A. A. Andrade; 'Experiments and Observations on Electricity, made at Philadelphia, in America, to which are added, Letters and Papers on Philosophical Subjects,' by B. Franklin, LL.D., F.R.S., fifth edition, 1774, from Mr. B. Heald.

To the Museum.—A fine specimen of Cuttlefish Bone, and one of Spurious Chiretta, from Mr. A. H. Squire; Specimens of Bombay Santonica, Stony Assafœtida, Toot (fruits), Mangalore Cardamoms, Mafura Seed, Dragon Wood, Baridche, Pods of *Acacia concinna*, and Rosia Root, from Mons. C. Chantre; Specimens of Wood Oil, Quillai Bark, Diwool Gum, Alcornoque Bark (*Bowdichia virgilioides*), Bark of *Dryobalanops aromatica*, and Ceylon Gamboge, from Dr. Trimen; Specimens of Double Cocanut, Japanese Isinglass, and a Specimen of Seaweed used in lacquering, from Mrs. Reeves; Specimens of Physic Nuts, Gum Acroides, and Crab Nuts, from Messrs. Battley and Watts; Specimen of Nepaul Pepper, from Mr. Bullock; Specimens of Koost shirin, false Koost, and of the Aloes Wood of Indian commerce, from Dr. Forbes Watson; Specimen of Saligenin, from Professor Attfield; Specimen of Chaulmoogra Seeds and Kernels, oil expressed without heat from the seeds, and oil obtained by boiling the seeds after expression, from Mons. E. Lumean, Mauritius; Specimens of Biennial Henbane, Annual Henbane, and dried root of *Rheum officinalis*, from Mr. Rufus Usher, of Banbury.

The following specimens have been received from Dr. Dymock, of Bombay:—

Roots.—Bikhma, Ulti, Geeno, Maregama, Asgund, and Roklee roots; the roots of *Xanthoxylon Rhetsa*, *Boerhavia diffusa*, *Tinosphora cordifolia*, *Asclepias currassavica*, *Sida acuta*, *Holarrhena antidysenterica*, *Aristolochia indica*, *Polypodium quercifolium*, and *Cissampelos Pareira*.

Barks.—*Mimusops elengi*, *Abutilon indicum*, *Mesua ferrea*, *Salix tetrasperma*, *Rhamnus Wightii*, *Ailanthus excelsa*.

Plants.—*Physalis somnifera*, *Erythræa Roxburghii*, *Microrhynchus sarmentosus*, *Tiaridium indicum*, *Vitex Negundo*; leaves of *Dœmia extensa*, and flowers of *Mesua ferrea*.

Seeds.—*Corchorus trilocularis*, *Abutilon indicum*, *Hydnocarpus inebrians*, *Phyllanthus madraspetalus*.

Specimens of Abusharee Hing and Candahar Hing, of the gum resin of *Balsamodendron Roxburghii*, and of wood oil obtained from *Bignonia xylocarpa*.

The President, having alluded to the fact that the opening of the session was coincident with that of the School of Pharmacy, called upon Professor Redwood to make his

Report on the Chemistry and Pharmacy Class.

Professor Redwood said, he and his colleagues had appeared there so frequently for a similar purpose that he feared they might be accused of repeating a thrice-told tale. Their object was to introduce to the meeting a number of gentlemen who had been devoting themselves during the past session to the acquirement of that practical acquaintance with the science and practice of pharmacy which it was the object of that school to impart. They had been gradually endeavouring to increase the qualification of those who were authorized by law to become pharmacists; but without occupying further time, he would say that during the past session the students had very satisfactorily acquitted themselves. The instruction given by means of the lectures was divided into two courses, examinations being held at the end of each. At the end of the first course a bronze medal and certificates of merit were awarded, and the same at the end of the second course, as well as a silver medal and certificates of honour to those who had studied for the whole ten months' session. At the end of the first course there were five competitors, the first of whom obtained 92 marks out of a possible total 100, and the four others obtained respectively, 88, 84, 82, and 77. Several of these gentlemen continued their studies during the second course; and one of them, Mr. Bullen won the silver medal with 90 marks, whilst others obtained 89, 88, 77, 72, and 68. He could only add that all these gentlemen were fully entitled to the distinctions conferred upon them. The list of names are given below.

The following is a list of the students in this class to whom prizes had been awarded:

Ten Months' Session.

Silver Medal	George William Bullen.
Certificates of Honour	Robert Henry Parker. Geo. Fredk. Gutheridge. Rawson Parke Francis.
Certificates of Merit	David Avison. Robert Brown Betty.

Five Months' Courses.

First Course.

Bronze Medal	George Fredk. Gutheridge.
Certificates of Merit	Rawson Parke Francis. David Avison. George William Bullen. Henry Peirson.

Second Course.

Bronze Medal	Robert Henry Parker.
Certificate of Merit	Robert Brown Betty.

The following were the questions for the examinations:

Chemistry and Pharmacy.

First Course. Bronze Medal.

Time allowed: Three Hours.

1. What is the length of a pendulum that oscillates in seconds of time, in a vacuum, at the latitude of London, and at the level of the sea?
2. What is the length expressed in inches of the French metre?
3. What is the weight of a cubic inch of water at 62° F.
4. What are the weights in grains of the gramme, decagramme, and centigramme?
5. What relations do the gramme and the litre bear to the metre?
6. How would you determine the specific gravity of calomel? Specify all the required details of the process.
7. What relation does the rate of diffusion of a gas bear to its specific gravity?
8. Describe the methods of producing ozone, and state what its composition, properties, and supposed influence in the atmosphere are.
9. Describe the production, composition, and properties of hydriodic and iodic acids.
10. Explain the Pharmacopœia process for the production of sulphate of copper. Describe the characters of this salt, including its crystalline form, and point out the means of detecting the presence of iron in it.
11. Describe the production of chloroform and hydrate of chloral.

Second Course. Bronze Medal.

Time allowed: Four Hours.

1. Explain the meaning of the terms density and specific gravity.
2. Describe minutely the apparatus you would employ, and the method you would adopt in taking the specific gravity of a liquid at 60° Fahr., while the temperature of the surrounding air is at 70° Fahr.
3. What is the force to which capillary attraction is due, and how do you explain the ordinary phenomena of capillarity?
4. Describe the process of clarification as applied to liquids of different kinds.
5. State what you know with reference to nitric acid, including its production and properties.
6. What are the distinguishing characters of metallic as compared with non-metallic bodies?
7. Describe the production of caustic potash, and soda in solution, and also in the solid state, representing the conditions under which the products may be most advantageously obtained.
8. Explain the action of diluted sulphuric acid on zinc, iron, lead, copper, and mercury.
9. Describe the composition and properties of cane and grape sugar, and point out the sources and methods of production of these sugars.
10. What are the changes that occur in the production of malt from barley, and in the production of spirit from malt?

SESSION. SILVER MEDAL AND CERTIFICATES.

Time allowed: Three Hours.

1. Describe the process of dialysis, and the facts which form the basis on which this process is founded.

2. Explain the dynamical theory of heat, and give the meaning of the terms conduction, convection, radiation, and transmission of heat.

3. What is meant by the term latent heat? What are the latent heats of water and of steam, and are these constant or varying amounts?

4. Describe the spectroscope, the purpose for which it is used, its mode of action, and some of the results obtained with it.

Time allowed: Three Hours.

5. Describe sulphur, its sources and allotropic conditions; also sulphuric anhydride and acid, with the processes by which they are obtained, and their properties.

6. Describe the salts to which the generic term alum is applied, distinguishing the alum of the Pharmacopœia, and representing generally the mode of production of commercial alum.

7. How would you define an organic body, and how distinguish such from an inorganic body?

8. Give a sketch of the class of organic compounds to which the generic name of alcohol is applied, and describe the production of the one which is commonly called alcohol or ethylic alcohol.

9. Describe oxalic acid, giving its composition, modes of production, natural sources, and properties.

10. Describe cyanide, ferrocyanide, and ferridcyanide of potassium, and the processes by which they are obtained.

The PRESIDENT then called upon Professor Bentley to make his

REPORT UPON THE BOTANY AND MATERIA MEDICA CLASS.

Professor BENTLEY said that it had been his honour and pleasure for more than a quarter of a century to come forward on similar occasions to the present and make a most gratifying report as to the classes entrusted to him. Without going over the ground already covered by his colleague who had preceded him, he might say that his students during the past year had fully maintained the high character of the School of Pharmacy, not only as to their regularity and punctuality of attendance, but also as to their good conduct and the proficiency they had attained. It was often said that lectures in themselves were no test of education, and should in all cases be supplemented by examinations, and it had always been his practice to follow this plan, and he could therefore speak of the proficiency of the students very safely. Every week he held *vivâ voce* examinations, which enabled him to test the progress of the students, and enabled them to apply to him for further information. Thus he was able, he hoped, to be not only the teacher, but the friend and adviser of his pupils. He could speak also not merely of the conduct of the students in the school, but also in the Botanical Gardens in Regent's Park, and he could conscientiously say that he had never found a body of students more ready to gather information than those of the School of Pharmacy. He might also say, having had considerable experience, that he knew what certificates and medals were, and that no medal or certificate was awarded here, unless a certain standard of merit was reached, that standard being 80 marks out of 100. Those who were familiar with competitive examinations would bear him out that this was a strong test of efficiency. After giving the names and number of marks obtained by the respective competitors, Professor Bentley concluded by stating that he had never had six gentlemen at one examination obtaining so high a number of marks as on the present occasion, and he was quite sure they would reflect honour on themselves, their teachers, and the calling they were destined to pursue.

The following is a list of the students in this class to whom prizes were awarded:

TEN MONTHS' COURSE.

Silver Medal	Robert Henry Parker.
Certificates of Honour	George William Bullen. Geo. Fredk. Gutheridge. Henry Peirson. David Avison. Rawson Parke Francis.

FIVE MONTHS' COURSES.

FIRST COURSE.

Bronze Medal	Geo. Fredk. Gutheridge.
Certificates of Merit	Rawson Parke Francis. George William Bullen.

SECOND COURSE.

Bronze Medal	Robert Henry Parker.
Certificates of Merit	Stewart Hardwick. Robert Brown Betty.

The following were the questions for the examinations:

BOTANY AND MATERIA MEDICA.

FIRST COURSE. BRONZE MEDAL.

Time allowed: Three Hours.

1. State generally the characteristic distinctions in structure between the stems of dicotyledonous, monocotyledonous, and acotyledonous plants.

2. Describe the general characters and chemical composition of starch and chlorophyll.

3. Describe the structure of the seed, and explain the process of germination.

4. What are the supposed botanical and geographical sources of the official rhubarb root? Describe the general characters and chemical composition of this drug, and enumerate its official preparations.

5. What are the botanical and geographical sources of scammony? What are the characters of pure scammony? How is it obtained? With what substances is it adulterated, and how may they be detected? Enumerate its official preparations.

6. What are the botanical and geographical sources of Pareira root? Describe its general and chemical characters, the means of distinguishing it from spurious roots, and enumerate its official preparations.

SECOND COURSE. BRONZE MEDAL.

Time allowed: Three Hours.

1. Define the following:—Pitted, spiral, and annular cells; and reticulated, scalariform, and laticiferous vessels.

2. Give the distinctive characters of roots and stems; define the corm, bulb, and culm, as applied to stems; and the terms tubercular, fasciculated, and adventitious, as applied to roots.

3. Define the following kinds of inflorescence:—Spike, raceme, capitulum, umbel, cyme, and verticillaster.

4. Give the characters of cruciate, papilionaceous, labiate, and personate corollas.

5. What are the botanical and geographical sources of buchu leaves? Describe the leaves of the different official species; mention their medical properties, and their official preparations.

6. What are the botanical and geographical sources of copaiba? Describe its general and chemical characters.

Mention the substances used to adulterate it, and the means whereby they may be detected.

7. What is the botanical and geographical source of cinnamon? How is it obtained? What are the characters by which it may be distinguished from cassia? and what are its official preparations?

SESSION. SILVER MEDAL AND CERTIFICATES.

Botany.

Time allowed: Three Hours.

1. Describe the general characters and chemical composition of starch and chlorophyll.
2. Define the following terms as applied to leaves:—Fascicled, equitant, revolute, dentate, crenate, pinnate, pedate, pinnatifid, decompound, phyllode, ligule, and decurrent.
3. Define the following terms:—Cupule, glume, spathe, exserted, declinate, gynandrous, syngenesious, didynamous, corona, disk, receptacle, and thalamus.
4. Describe the structure of the embryo, and explain the process of germination.
5. Give the essential characters of the following natural orders:—Ranunculaceæ, Umbelliferæ, Scrophulariaceæ, Labiatæ, Orchidaceæ, and Melanthaceæ.

Materia Medica.

Time allowed: Three Hours.

1. Describe the botanical sources, modes of extraction, general characters, varieties, and adulterations of guaiacum resin. How may it be detected when employed to adulterate scammony?
2. Mention the botanical and geographical sources of *annulated*, *striated*, and *undulated ipecacuanhas.* Describe their general characters, and enumerate the various official preparations into which ipecacuanha enters as an ingredient.
3. Describe the general characters of myrrh; mention its botanical and geographical sources, the substances used to adulterate it or which are substituted for it, and its official preparations.
4. Describe the physical and chemical characters of the seed of *Strychnos nux vomica*; mention its official preparations and their doses.
5. What are galls? how are they produced? Describe the general and chemical characters of the official galls, and enumerate the preparations in the B. P. in which they enter as an ingredient.
6. Describe the general and chemical characters of white hellebore rhizome, and show how it may be detected when mixed with valerian.

The PRESIDENT then called upon Professor Attfield for his

REPORT ON THE PRACTICAL CHEMISTRY CLASS.

Professor ATTFIELD said, the cheering with which the professors were always greeted on these occasions was, in his own case, in part at least, to be awarded to his excellent assistants. He regretted that the senior demonstrator of last year, Mr. Davies, had left the laboratories, but he had no doubt that Mr. Davies would find his new sphere of action as public analyst congenial, and that from his knowledge of the exigencies of business he would at least do that which some public analysts did not succeed in doing, namely, check adulteration without unduly worrying the trader. Professor Attfield said that he would not trouble the meeting with the elaborate statistics which he laid before the Council in July, but he might say that the periods of study had been about the average, that the attendance was very good, and the conduct of the students that of gentlemen. Of course, it would be understood that where a number of young men in the prime of youth and health were gathered together day after day, ebullitions of animal spirits would sometimes arise which might be considered slight breaches of discipline, but they had very seldom occurred in past years, and when they had he never found any difficulty in checking their extension. During the session he had had eighty-eight students, which was slightly below the average of the past ten years, but twelve above the average of the fifteen years during which he had been Professor of Practical Chemistry. Considering that the number of students entering pharmacy was smaller than in previous years, that the regulations of the school excluded—most properly—those who wished to be merely "prepared," as it was termed, for examinations, and that their doors were also shut to those who wished to be instructed in prescriptions, the recognition of galenical preparations and actual dispensing, etc., and that, therefore, their pupils were drawn from a comparatively small class, he did think 90 or 80, or even 70 or 60 was a very satisfactory number. He concluded by reading the names of the successful competitors, and the number of marks obtained by the first nine, viz., 95, 90, 85, 80, 78, 76, 70, 65, and 60.

The following are the names of the students in this class to whom prizes were awarded:

Silver Medal	Robert Henry Parker.
Bronze Medals	Geo. Fredk. Gutheridge. Rawson Parke Francis.
Certificates of Honour	George William Bullen. William Ralph Atkins. William Bevan.
Certificates of Merit	David Avison. Walter Barber Tuck. Fredk. Wm. W. Corden.

The following were the questions for this examination:

PRACTICAL CHEMISTRY.

Two Days' Examination.

Hours 10 to 5 on each day.

(*Books and Memoranda permitted.*)

FIRST DAY.

1. Report on the quality of the "chloroform" supplied to you.
2. You have a "lotion": What saline matters are present?
3. Ascertain the proportion of quinine in the sample of "citrate of iron and quinine."

SECOND DAY.

4. Is there any sugar in the accompanying "urine"?
5. Is there any potato starch in the "flour"?
6. What is the percentage of citric acid in the "lemon juice"?

NOTE.—Manipulation as well as results will be scrutinized.

The President next asked Professor Bentley to report upon

THE BOTANICAL PRIZE.

Professor BENTLEY, in speaking of the Herbarium competition, desired to impress on young students not to neglect the opportunities afforded them at this period, which they would never have again, to obtain a certain amount of practical knowledge, not only of their actual calling, but of its scientific bases. He referred especially to botany, and at the present moment he believed this science had a home amongst the students of pharmacy, who knew its value in the future practice of their calling. This was long ago foreseen by the Council who instituted prizes for a practical knowledge of botany. On the present occasion there were three very meritorious collections sent in. He had examined them with great pleasure, especially the one to which the silver medal had been awarded, consisting of 715 specimens, which Mr. Williams, who sent it in, informed him had been collected entirely before 8 o'clock in the morning, and during one week's holiday.

The following were the awards that had been made:

Silver Medal......................J. T. Creswick Williams.
Bronze Medal ....Thomas Francis Elton.
Certificate of Honour ....John William Ellis.

The PRESIDENT then asked Mr. Carteighe to state the result of the competition for

THE COUNCIL EXAMINATION PRIZES.

Mr. M. CARTEIGHE said, the Council prizes were offered for competition to those who had passed the Major examination during the year. It was obvious that the number of competitors was somewhat limited by the conditions and by a kind of natural selection, but the number who came forward this year, viz., twelve in London, and one in Edinburgh, was in no way discouraging. It was not likely that in future years the same examiners would be called upon to conduct these examinations, and therefore he had much pleasure in stating that the general character of the knowledge shown by all the candidates was much better than last year. It was very gratifying to find that one of the prizes had been taken by a gentleman north of the Tweed, and he had no doubt that on some future occasion the examiners would feel pleased to be able to place a candidate from some school not much heard of at the top of the list.

The following were the awards that had been made:

PEREIRA MEDAL (*Silver*); *and Books value £5, presented by Thomas Hyde Hills, in Memory of Jacob Bell.*
George William Bullen.

PHARMACEUTICAL SOCIETY'S MEDAL (*Silver*) *and Books value £3, presented by Thomas Hyde Hills, in Memory of Jacob Bell.*
Henry George Greenish.

PHARMACEUTICAL SOCIETY'S MEDAL (*Bronze*) *and Books value £2, presented by Thomas Hyde Hills, in Memory of Jacob Bell.*
William Inglis Clark.

The following were the questions for this examination:

MATERIA MEDICA.

1. What is salicin, and how is it made? State its relations to salicylic acid.
2. What is ergot; how produced; and what are its active constituents?
3. Describe the varieties of buchu, and how to distinguish them from other leaves that may be substituted for them, or mixed with them.
4. What is camphor? State its sources,—geographical and botanical, method of purification, and chemical relations.

BOTANY.

1. Describe the varieties of æstivation; giving an example of each.
2. Describe the inflorescence and fructification of wheat.
3. Describe, botanically, the fruits of the dog rose, strawberry, raspberry and plum.
4. What are the distinguishing characters of the orders Labiatæ, Scrophulariaceæ, and Polygalaceæ?

Time allowed: Three hours for both of the above papers.

CHEMISTRY.

Time allowed: Three Hours.

1. The silver salt of an organic acid contained 62·44 per cent. of metallic silver. It also contains 17·34 per cent. of carbon, and 1·73 per cent. of hydrogen. From these data endeavour to find a formula for the acid.
2. Define the terms, *allotropy*, *metamerism*, *polymerism*. Illustrate each definition by several examples.
3. Give a concise account of the manufacture of cast iron, wrought iron, and steel.
4. How are the metals, barium, calcium, and magnesium respectively prepared in a state of purity? Describe their physical and chemical properties.
5. Describe the best process for *separating* from each other antimony, arsenic and tin.

The PRESIDENT then asked Mr. Umney to report upon the examination for

THE JACOB BELL MEMORIAL SCHOLARSHIPS.

Mr. UMNEY said, it gave him much pleasure, as an old Bell Scholar, to say a word or two on the examination for the Jacob Bell Memorial Scholarships. There were fourteen candidates; the questions were set by two members of the Board of Examiners, and were sent to the various centres to be answered, and the marks upon which the award of the prizes was based were not given to the young men themselves, but, in the first instance, to the mottoes affixed to the examination papers, the envelopes of the successful candidates corresponding to the mottoes being afterwards opened by the President to discover the names. The two gentlemen who were successful showed very high excellence indeed, especially in arithmetic, Latin, and chemistry. He had only one regret to express, and that was that more students did not compete for these valuable prizes, which really contained in themselves three rewards. There was first the honour; second, the excellent instruction given in that building gratuitously; and last, the money prize. He hoped, therefore, that in future a much larger number would compete. In conclusion he had to report that the successful competitors were

HENRY ALLAN, and
JOHN GRAHAM SANGSTER.

The following were the questions for this examination:

CHEMISTRY AND PHARMACY, AND BOTANY.

Time allowed: Two Hours.

CHEMISTRY AND PHARMACY.

1. State all you know of the element *bromine*.
2. Give the symbolic formulæ for all the compounds of phosphorus with oxygen and the processes for their production.
3. How many grammes of chlorine could be produced from 100 cubic centimetres of hydrochloric acid (Brit. Pharm.) when made to act upon lead dioxide? and state how many litres it would occupy at 0° Cent.
4. Describe minutely the official process for the manufacture of citrate of iron and quinine, its appearance as met with in trade and the tests necessary to prove the absence of impurities.
5. Describe the official processes for the preparation of liquid extract of ergot, extract of stramonium, tincture of acetate of iron, and syrup of iodide of iron.

BOTANY.

6. Name the *nutritive organs* of plants, and state thei functions.
7. State the meaning of the following words:—*phyllotaxis, ovule.*

Latin, etc.

Time allowed: Three Hours.

LATIN.

1. Translate into English:—

Namque ipsa decoram
Cæsariem nato genetrix, lumenque juventae
Purpureum, et laetos oculis afflarat honores.

2. Parse fully *ipsa, nato, juventae, laetos.*

3. Translate into English:—

Cum aquâ parcè coit, et limpidus perstat; scilicet ratione fluidunciæ in aquæ octario dimidio.

4. State the present, perfect, supine and infinitive of *coit, perstat.*

5. Translate into Latin:—

It is very soluble in sulphuric æther, less in alcohol, but very slightly in water.

ARITHMETIC.

6. By how much does $\frac{5}{8}$ of $\frac{4}{10} - \frac{7}{9}$ of $\frac{4}{21}$ exceed $\frac{5}{6}$ of $\frac{2}{15} - \frac{3}{8}$ of $\frac{4}{18}$?

7. Divide to four places of decimals 37·24 by 2·9, ·0719 by 27·53.

8. Find the number of solid inches in a cube the length of whose side is a decimetre.

9. The price of ·0625 lb. of balsam of tolu is ·4583 shilling, what quantity can be bought for £61 12*s.*, and what will be the value per lb.?

10. A druggist buys two chests of manna containing 2 qrs. 17 lbs. at 3*s.* $1\frac{1}{2}$*d.* per lb, and two chests each containing 3 qrs. 7 lbs. at 3*s.* $5\frac{1}{2}$*d.* per lb., what will he gain per cent. by selling a mixture of the cases at 4*s.* per lb.?

ENGLISH.

11. Parse the following:—

The pleasures of the imagination, taken in their full extent, are not so gross as those of sense, nor so refined as those of the understanding.

12. Write a short essay on *War.*

FRENCH AND GERMAN.*

13. Translate into English:—

Louis Quatorze, qui régna près de soixante-douze ans, détruisit les duels, protégea les sciences, et récompensa toujours le mérite; il réussit à maintenir son petit-fils Philippe Cinq sur le trône d'Espagne, malgré plusieurs rois ligués contre lui. Louis Seize assembla les états généraux en 1789, pour réparer l'état de ses finances; cette assemblée a opéré la révolution Française, dont l'histoire seule demande dos volume entiers.

And translate into French:—

They have the power to make peace and war; they locate the army and navy; they alone can assemble, prorogue, and dissolve Parliament.

Or translate the following into German:—

Everything that is new or uncommon raises a pleasure in the imagination, because it fills the soul with an agreeable surprise, gratifies its curiosity, and gives it an idea of which it was not before possessed. We are, indeed, so often conversant with one set of objects, and tired out with so many repeated shows of the same things, that whatever is new or uncommon contributes a little to vary human life, and to divert our minds for a while with the strangeness of its appearance.

The President next proceeded to deliver the prizes and certificates to the successful competitors, adding in each case a few appropriate words of counsel and encouragement.

At the conclusion of this portion of the proceedings, Mr. William Southall, F.L.S., of Birmingham, delivered the following—

* The Candidate is at liberty to choose either French or German, and is not required to show a knowledge of both.

Inaugural Sessional Address.

When I was informed by the Secretary that the Council had done me the honour of an invitation to deliver the inaugural address, two conflicting emotions occupied my thoughts; the first was that of gratification at the reception of such a proposition; the second, and by far the most powerful, was the feeling of utter inadequacy to fulfil the task in a manner that should be at all equal to the importance of the occasion, and that would maintain the honour of the Society and my own self-respect. At length I decided to make the attempt, and must beg you to receive with kind consideration the result of my efforts. It is a considerate thing on the part of the Council to call up to this office provincial druggists like myself, men who entered the trade when the great changes in its position were only commencing and who did not obtain the benefit of the academic training which many of its members now enjoy.

I conclude that those gathered before me are brought here by a desire to inform and educate their minds and to obtain knowledge; not merely the technical knowledge which by dint of hammering out may be sufficient to enable them to pass their examinations, but to obtain some true insight into certain of the laws of nature, and a practical acquaintance with certain productions of nature and art. The special sciences here taught are chemistry and botany, and the technical instruction given for the purposes of your profession is comprised in materia medica and pharmacy. Short I fear is the time that many of you propose to set apart for this worthy undertaking. Short, perhaps, not of your own choice, but through the imperative requirements of circumstance; nevertheless, short though it be, compared with the vastness of the field before you, much will depend upon yourselves and the use you make of the time allotted. Many of you I know come here grounded in your studies by your previous labours, and it is an injustice to your professors and to yourselves to suppose that any can come here with a mind like a sheet of white paper and have the necessary instruction written thereupon in the course of a few short months, and, I may further add, without much trouble to himself. Much time may be saved by a judicious method of working, but the great matter is to have your heart in your work. According to the latest philosophic views in which the doctrine of heredity bears so large a part, there is no intellectual knowledge, properly speaking, no acquisition at all, but every mind simply develops into activity all the potency within it. Touch, then, the true chord and you will find a responsive answer. Whether these notions be true or not as regards original endowment, it is clear that we have an intellectual heritage in the gathered fruits of other men's labours, and that we who live in these latter days are in a vastly better position as learners than those who have gone before us. The scheme of knowledge as regards the sciences alluded to is presented to you in a manner clearer and more definite than ever before. It is true that the ocean of organic chemistry is a great deep, but its depths have been sounded, the laws of its navigation are daily better understood, and false beacons have been removed out of the way. The great mass of details that is published in works on these sciences may alarm some minds, but it must be remembered that knowledge of details beyond those specially required must be a gradual and accumulative work.

It seems to me that I cannot do better than occupy your attention this evening with a few desultory remarks about the "nature of things," especially in connection with chemistry and botany, in which you may, perchance, hear something that will catch your attention, and incline you to press forward in the chase after knowledge.

The science of chemistry is a modern creation, and if we look back one hundred years, we meet with the names of many great men to whom its development is due. Centennial anniversaries are now the fashion, and three years back we in Birmingham did ourselves the honour of celebrating the discoveries of our townsman Priestley. He was a prophet without honour in his own time, burned out of house, and driven from home and country by the Church and King mob of 1791. The Nemesis soon followed, and having cast aside tradition, Birmingham rejoices at present in being the foremost representative of rational views.

You will remember that the best known of the discoveries of Priestley was his discovery of oxygen, which he called phlogisticated air; but notwithstanding this discovery of the gas most eminently adapted for supporting combustion, he, with Cavendish and Scheele, and other great chemists of his time, continued to hold erroneous views respecting combustion. They considered combustion to be a decomposition, and believed in the presence of an imponderable matter, termed phlogiston, asserting that the functions of the air consisted in removing phlogiston from combustible bodies. Phlogiston, said they, differs from gross forms of matter in being specifically light, and when taken from a body increases its weight. Lavoisier was the first to see clearly that these views were erroneous, and that in every chemical process, increase of weight means increase of material, and loss of weight loss of material. Boyle, first of the true chemists (and Geber, the Arabian, hundreds of years before him), had previously noticed the fact that metals increase in weight when calcined in the air, but he attributed it to the heat absorbed. Lavoisier showed its true significance, and confirmed it by the discovery that there was a diminution in the volume of the air when lead was converted into litharge in a closed vessel. From this time the part played by the air in the phenomena of combustion was clearly established, and a new era may be said to have opened in chemistry. A remarkable and important research by Dr. Black, of Edinburgh, made at a rather earlier period, on the difference between mild and caustic alkalies, is of much interest in this connection. The mild alkalies (carbonates) were at that time regarded as simple substances which became caustic by combination with a fiery matter. Lime was supposed to take up this fiery matter in the process of burning, and to be capable of transferring it to other alkalies. This hypothesis further explained the fact that lime after being used to render mild alkalies caustic is no longer itself caustic, having transferred its own fiery matter to the alkali. Black, however, discovered from observations that caustic lime when exposed to the air becomes heavier, at the same time that it loses its causticity; he therefore rejected the doctrine of a caloric or fiery substance. His researches also led him to the conclusion that effervescing earths and alkalies contain as one of their essential constituents a gas which can be expelled by heat from the former but not from the latter, from both, however, by acids; that the alkalies and earths when freed from this gas, which he called fixed air, became caustic, and therefore that their causticity does not depend on the presence of a peculiar substance, but upon the absence of the fixed air, and that caustic lime does not render mild alkalies caustic by imparting any caustic or fiery principle, but by abstracting their fixed air. This admirable research, which may be considered as the first that showed the importance of quantitative relations in the interpretation of chemical reactions, was also the inauguration of those ideas of chemical combination and decomposition which were afterwards extended to the whole range of chemical phenomena. Black, however, did not at first perceive the analogy between the results of this investigation and the antiphlogistic view of the theory of combustion, but ultimately he became a convert to Lavoisier's views.

The battle between the phlogistic and the antiphlogistic chemists has almost passed out of mind, but in a certain sense it might almost be said that the phlogistic chemists were right, for although a body in burning may gain in weight, it loses something, that is the power of emitting a certain quantity of heat; in other words it loses a certain amount of potential energy. As Black and the chemists of his day showed that the chemical changes of matter were simply changes of form, and not loss of substance—so about the year 1840, Joule and other physicists brought forward the doctrine that the thermal changes evidenced in combustion, etc., were but manifestations of the transference of energy, and that, like matter, it was never put out of existence, but disappearing in one form, it reappeared in another. The physical philosophers of the present day would now call every power, and force and influence, that is felt, seen, or heard, merely a form of energy. Muscular or mechanical power is that form of energy called work; whilst heat, light, and electricity, are simply transformations of the same. The pendulum exhibits in a simple manner two forms of energy, potential and kinetic. When the pendulum is vibrating there is constantly a transformation of energy of the simplest kind. By raising it with the hand it acquires energy of position, or potential energy, which it gradually loses as it falls, acquiring instead energy of motion or kinetic energy. This again is lost as it rises, and were there no friction and no resistance from the air, the process would repeat itself perpetually. Potential energy is stored up in the wound-up spring of a watch, a bent bow, or in gunpowder; kinetic energy is exhibited in the motions of the winds and waves, and currents of water, or currents of electricity.

The old plan of obtaining fire by boring rapidly a piece of soft wood with a pointed piece of harder wood is a simple and plain example of the transformation of energy into heat. The transformation of heat into energy is shown in the working of a steam engine. Begin with work and you can transform it all into heat. Begin with heat, however, and you cannot, for reasons well understood, transform it all into work. If it were possible to so convert it and to avoid friction you might construct a reversible engine in which the heat might as it were be pumped back again. The equivalence, however, between heat and work definitely subsists and has been accurately determined. It has been ascertained by Joule that a pound of water which has fallen 772 feet and had the whole mechanical force of its fall converted into heat, is one degree Fahrenheit hotter than before falling.

In muscular energy you have an animal engine performing work. Its fuel is, of course, food, and for the amount of fuel employed it will produce a greater amount of work than any other engine. Part of this fuel is employed in work, and part in producing the heat that is given off in large measure by the body.

This food is principally supplied by the vegetable products of the earth, and there is as it were a constant pendulum process going on between animals and vegetables, the latter using, as we may say, the ashes and burnt up material of the former, in the shape of carbonic acid, etc., the sun at the same time supplying radiant energy, to make up for that dissipated in the various processes of animal heat, muscular exertion and decay.

The same applies to electricity. Whenever an electric current passes through a galvanic battery a certain quantity of zinc is consumed, or as we may put it, a certain quantity of potential energy in the battery is converted into the kinetic energy of a current of electricity; pass that current through an induction coil and a portion is converted into magnetism, whilst a further induced current can be used to produce heat, light or sound. In this case the transformations are more complicated. Work is directly converted into electricity by the electroplater who employs a steam engine to drive an electro-magnetic machine; and in all these cases the energy so transformed is capable of measurement.

In the case of chemical action the same principle holds good. To undo a direct chemical union the potential energy which the bodies have lost in combination must be restored; for example, to separate hydrogen from its combination with oxygen, in other words, to unburn it, a certain amount of heat or its equivalent of energy in some shape must be employed. Where hydrogen combines with oxygen to form water a certain quantity of potential energy in the form of heat is dissipated, and this must be restored. This may be effected by oxidizing a body such as zinc in contact with the water. Now, when zinc is acted upon by acidulated water it is oxidized at the expense of the hydrogen, which is set free as gas, and this oxidation is attended with considerable loss of heat in addition to that acquired as potential energy by the escaping hydrogen. The same restoration of heat may be effected by muscular energy in the shape of work applied to the handle of an electro-magnetic machine, the current from which when passed through water will effect the separation of the oxygen and hydrogen. But the most direct way of restoring the heat lost in the combination is that of passing the vapour of water through a coil of platinum wire intensely heated by the flame of an oxyhydrogen blowpipe, when the vapour is resolved into oxygen and hydrogen gases, which may be collected over water. The potential energy is directly transferred from one portion of hydrogen burned outside to that previously in combination with oxygen within, and effects its separation.

We saw in the first place that a great truth was brought to light by the chemists of the latter part of the eighteenth century, viz., that matter is indestructible, however it may change its form. As Faraday expressed it, "a particle of oxygen is ever a particle of oxygen, nothing can in the least wear it. If it enter into combination and disappear as oxygen; if it pass through a thousand combinations, animal, vegetable, and mineral; if it lie hid for a thousand years and then be evolved, it is oxygen with its first qualities. Neither more nor less. It has all its original force, and only that; the amount of force which it disengaged when hiding itself has again to be employed in a reverse direction to set it at liberty." To this must now be added another great central truth which though more recently discovered is not less far reaching or important, namely, that energy is indestructible and is measured by work. To quote Faraday again, "All that we have that is good and safe, as the steam-engine, the electric telegraph, etc., bear witness to that principle. It would require a perpetual motion, a fire without heat, heat without a source, action without reaction, cause without effect to displace it from its rank as a law of nature."

The ancient Greek philosophers in their studies of the world were profoundly impressed with the majesty of the operations of nature. I am not about to intrude upon your notice the astronomers, mathematicians, and geometers of Greece, but just to mention that in the works of one of her philosophers, Democritus, we have the first glimpses of the atomic theory. But before entering upon this subject I will, by the way of a pleasant digression, call your attention to the fact that Aristotle, the prince of philosophers, the author of the inductive mode of research, and the father of natural history, was a druggist at Athens. I do not say that this can be asserted without dispute, though the well-known American author, Dr. Draper, states it without reservation. Bayle says it cannot be proved that he was a "pharmacien." Dr. Smith considers the statement that he had run through his parental estate and become a "*φαρμακοπώλης*," a calumnious charge; let us hope he meant as regarded his loss of fortune and not as to the nature of his respectable profession. At all events, what a thrill it should send through your souls to call up the idea of Aristotle, a druggist of Athens, attending the lectures of Plato.

Aristotle's pupil, Theophrastus, wrote on materia medica and botany, and it seems natural that he should have drawn his inspiration from his master. But we will return to Democritus only to observe that the views he foreshadowed were taken up by the Latin philosopher and poet, Lucretius. Lucretius has acquired a bad reputation because his intellect revolted against the absurdities of a worthless set of so-called divinities. It is true that the reaction carried him too far in the opposite direction. The editor of my copy, dated 1743, thinks it necessary to apologize for his work, which the rank of the writer alone as a classic poet caused him to undertake, and says, "What danger can any man apprehend while he reads that ridiculous doctrine of the Epicurean philosophers, concerning their atoms or minute indivisible corpuscles which they held to be the first principles of all things? an opinion so absurd that only to mention is to confute it."

The first great principle laid down by Lucretius is that "Nothing was by the gods of nothing made,"* and as a natural corollary "that nature does dissolve all bodies into their principles again; nor can reduce things into nothing." Now the notion of that day was that anything could be made out of nothing or of anything else almost, just as it happened. Pliny, a few generations later, in-

* *Lucr., De Rerum Naturâ*, Lib. I., 151, "Nullam rem e nihilo gigni divinitus unquam."

serted in his excellent 'Natural History' all sorts of stories of this kind, and down to our own times such pleasant histories as the genesis of geese from barnacles (you have the whole story in Gerard, with a plate), and pikes from pickerel weed, have passed current. In varied terms Lucretius repeats and affirms the view of the indestructibility of matter. After this he shows how the small particles and seeds of things are too subtle to be at all discovered by the eye. "What every day and nature do bestow on beings to make them grow by just degrees, not the most piercing eye could ever find, nor yet the particles that fly and waste by age or by decay. . . . Thus nature works by bodies not discerned." Had I time I could quote much more about his views respecting atoms. This early light upon "the nature of things" was however soon obscured, and remained so until Dalton revived the view that all bodies are formed of small individual particles termed atoms. To the old vague notion he attached a meaning by supposing on the one hand that the atoms of each kind of matter possess a constant weight, and on the other that combination between two kinds of matter takes place not by penetration of their substance but by juxtaposition of their atoms. This fundamental hypothesis being established, the general laws of definite proportions and of multiple proportions followed, and this hypothesis of atoms forms at present the foundation of all our theories, the solid base of our system of chemical knowledge. It gives a striking simplicity to the laws relating to the composition of bodies; it enables us to look into their intimate structure, and intervenes in the interpretation of their properties, reactions and transformations.

Now I do not want to give a lecture, but just to call your attention to some parts of the bill of fare that will be set before you, and if I can show that there are points of interest you may not have noticed in this wonderful "nature of things" it is all I desire. Let us take our text from our Latin poet again; I condense a little. After speaking of solid bodies he alludes to those that wander through the void. "These compose the thin air and the sun's brighter light. When the sun's light shoots its rays through a narrow chink into a darkened room, you shall see a thousand little atoms dance a thousand ways through the empty space and mingle in the very rays of light, engaging as it were in endless war; drawing up their little troops, never taking breath, but meeting and exercising their hostile fury with constant blows." Now, "it appears by these disorders that there are certain secret principles of motion in the atoms themselves,—and this variety of motion is certainly in the very particles. . . . There is nothing wonderful in this, that when all the primordial elements of things are in continual motion, the whole should at the same time seem to be at perfect rest, though every particular body has a sort of motion peculiar to itself, for the nature of the first particles is so subtle that they lie far beyond the reach of our sense."

Now I do not pretend to say how far this beautiful description is founded upon true insight or how far it is expanded by imagination, or indeed to what extent it relates to the air itself, but it reads singularly like the present molecular or kinetic* theory of gases. It is now considered that there is absolute proof that gases consist of particles of matter which are perfectly free and detached from one another, and which are constantly free and flying about in all directions. The simplest proof that we have of this is obtained by considering the way in which one gas diffuses through another, as, for instance, when any volatile substance in the form of vapour or gas is allowed to escape into a room, we find that, independently of all currents, it gradually mixes itself thoroughly with the air of the room. To permit of this perfect admixture the particles of a gas must be infinitely small and enormously numerous. The particles of one gas diffusing through another cannot move in straight lines, but must be constantly subject to incessant collisions with other particles. The rate at which diffusion of gases takes place can be ascertained by analysis, and from this rate may be calculated the number of collisions between the particles which take place in a single second. The calculations of mathematicians far transcend the most fertile imaginations of poets, and in sober earnest it is affirmed that the number of particles in a cubic inch of hydrogen is expressed by the figure 3 followed by twenty ciphers,* and that each particle moving at the rate of seventy miles per second is subject to seventeen thousands of millions of collisions in that same space of time.

In air the number of particles is not so high, but is amply sufficient to account for the admixture of the particles of oxygen and nitrogen in the atmosphere, and to render unnecessary any fear least the gases should become separated.† Chemists have but little to do with high numbers, but when we consider the precision of the calculations of astronomers, there seems no reason why there should not be the same exactitude with the calculations of what appears to our understandings as the infinitely small, as of the infinitely great, or of the infinitely distant, for it must be remembered that there is no such thing as absolute size; there is relative greatness and smallness—nothing more. I had the pleasure of hearing some months back a paper by one of our first mathematicians on the kinetic theory of gases, and I gathered that, although the correctness of the theory might be considered as proved, we might expect considerable modification in details, and, of course, its great extension.

Hitherto we have been considering not living matter only. We have seen that there is a rational explanation of the laws affecting matter, its combinations, motions and conditions; a genuine philosophy of matter, not metaphysical and speculative, dealing in occult and mysterious powers, but a scheme that is based upon deductions from solid facts. We have also seen that by availing ourselves of the knowledge and experience that have been gained of the working of these laws, we are enabled to regulate, control, and turn to our own account, the phenomena produced by their action. Let us now shift our ground a little, let us take a step further in our inquiry into the nature of things. We still have matter, but mostly in new forms; we still have energy exhibited in physical and chemical changes, but we find also superadded a new energy, an influence of a different kind, that we may to a certain extent assist or retard, but which we cannot initiate; an influence the origin of which transcends, and perhaps ever will transcend, all human research; I mean vital energy or life. Not the infinitely variable forms of the sun's

* κινητικός, putting in motion.

* 300,000,000,000,000,000,000.

† By this theory the other physical phenomena of gases are also explained.

energy have, unassisted, the power of producing the transformations of matter that take place under the influence of vital energy, nor can this itself be brought into play without the presence of the single germ that determines as it were the flow of the current of life.

In our first introduction to this altered state of things, we come upon a vast debateable region, one in which there are only glimmerings of life, and of which there is as yet but little definite knowledge. Its existence was mostly unknown in old times, its inhabitants as individuals being generally invisible to the naked eye. In the lowest and crudest forms we first meet with little lumps of contractile slime—monera, protamœbæ—without structure, without any definite form, and entirely without any hard or formed parts. Different observers make mention of lumps of sarcode, protoplasmic matter, plastic or formative material, matter of life; but the exact spot where it can be said, Here life begins—this is the lowest form of life,—has yet to be found. These slimy bodies, notwithstanding they are destitute of visible structure, nevertheless assimilate materials from their environment and grow. They constantly change their form, and are capable of executing slow movements, and by division they reproduce their kind.

A little higher in the scale and a nucleus is apparent, and by differentiation of the outward layers of the protoplasm a covering membrane or skin is formed. Little living cells with tails are now met with possessing powers of rapid motion—flagellata or whip swimmers—frequently changing their shape. Of these the little bright green euglena is constantly met with in fresh water pools, sometimes by its numbers giving to the water a green appearance. This green colour is chlorophyll, the colouring-matter of vegetables. Others swim by cilia, rings of rapidly vibrating hairs, after the fashion of ciliated infusoria; infusoria are, however, true animals. Then another class are called diatoms, cells with flinty shells, often of great beauty. Nor are these minute beings of no importance in the economy of nature for their vast numbers in some cases make up for their individual minuteness, and in some places we find rocks composed mostly of the skeletons of diatoms. I said it was a debateable region, for it is not as yet determined with any precision whether its inhabitants be animals or plants. For instance, the slime moulds (myxomycetes), inhabitants of tan pits and damp forests, whose spores can crawl many feet, were formerly considered to be real fungi, but are now considered by Haeckel and others to be akin to the lower animals.* It is sometimes said that the botanists call the plants animals, and the zoologists call the animals plants. By some naturalists these beings have been exalted into an intermediate kingdom, called Protista.

As these minute bodies dwell as it were on the boundary line of life and present the simplest forms of organization, they are earnestly scanned by those who would inquire *whether vitality is a result of organization, or whether organization follows because life has begun*. Whether, in short, the vital influence be something quite independent, or whether it be a mere property of matter. In attempting to solve this inquiry a great debate has arisen as to spontaneous generation; can any of these living beings come into existence without the aid of germs? At present the answer is pretty clearly in the negative. A second inquiry has arisen respecting the proof or the disproof of heterogenesis, that is, can living organisms be developed from germs springing from organisms dissimilar to those which are reproduced? It will be seen that both these questions have an important bearing upon the theory of evolution, and for the present heterogenesis also remains largely unproved. It must, however, be said that the metamorphoses and transformations of some of these bodies are so complex that a large field is still open for observation and research, and very much regarding them remains to be settled.

But it is time we left this debateable region, where speculation, theory, and research also, are so busy at work, and proceed to the more direct consideration of the second science which is taught in your school, namely, botany.

What is now understood by the science of botany is something very different from what it was when I was young, at least, as far as it was then taught in schools. At that time the knowledge of the Linnæan system of arrangement of plants was supposed to constitute the science, and a great charm there was in hunting for plants on the hills and roadsides, and by the brooks, carefully examining all their exterior characteristics, naming them with their botanical names, to the discovery of which the Linnæan system was a very good guide, making note of the wild spots whence they came, and then depositing them in our herbaria. Now, as my introduction will have shown you, botany is a section of biology, a plant is a life, a member of the great family of living beings, and in its simplest and earliest forms differs from animals in their simplest and and earliest forms, only as fingers might do on the same hand. A plant is now studied as a separate existence, endowed with all the powers necessary for its life, growth, and reproduction. The outward changes that take place in plants are by no means devoid of general interest. The manners and customs of plants are as diverse as those of men, and a volume might be written on their sociology. Dr. Erasmus Darwin long ago sang of the loves of plants (conducted strictly according to the Linnæan arrangement) in artificial verse suited to the days of powder and hooped petticoats. His descendant, the Darwin of to-day, has fashioned a far more romantic story of those loves in the sober words of truth. We learn from him how the bees and other insects carry messages of love and are rewarded with honey for their pains. How precautions are taken to prevent too early marriages, to preserve pure blood and to produce a healthy offspring. We also are shown the wonderful provisions and adaptations of different organs to diversified requirements.

Comparisons are sometimes made between men and trees, oaks or willows, as the case may be, but the resemblance may be traced in the other directions also; for are there not baobab trees as corpulent as the traditional alderman? Scotch thistles are the types of Scotch terriers. Is the mockery on the part of the higher order or the lower? It is certain that in our own land, and far more wonderfully in other lands, there are insects that imitate for protection's sake the leaves of the plants on which they feed. Plants breathe after their fashion, cut them and they will bleed, bruise them and you produce congestion, parasites of their own order hang about them,

* "Whether the myxomycetæ should take their place in the animal or vegetable kingdom, is a question which in the present state of our knowledge it is impossible to answer."—*Allman, Journal Linnean Society, Zoology*, September 1877.

and animal parasites infest them. They are even subject to clubbed limbs and other deformities, and Dr. Masters is their teratologist and orthopædic physician. Plants have their distinctions of race and pedigree, their aristocracy and tribes of low degree, their families and relationships, which systematic botanists now trace out and follow instead of an artificial arrangement. The laws of Malthus are a necessity with them, as dwarfing is a constant result of over population, and like men, plants often break down in the struggle for existence. Wanderers are some by air and by sea, whilst others travel more slowly underground. Peaceful are they as a rule but sometimes strange tribes harry the land like Huns and Vandals, and drive out the old inhabitants.

In the matter of voluntary movements plants seem but sluggards, but they have nevertheless many modes of motion of their own. The closing and dropping down of the pinnate leaves of the sensitive plant (*Mimosa pudica*) are well known. The leaves of the Dionœa clasp its prey—many flowers open or close with the changes of the sun and shade. The spores of some algæ swim freely. and those of many vascular cryptogams have distinct motions. Capsules scatter their seeds with force, and the new shoots of climbers revolve in a circle until they grasp a fresh support. But in some respects more noticeable than these, is the grand slow movement by means of which heavy loads are lifted by soft-bodied fungi, and rocks are riven by the roots of trees, and this is accomplished not by violence but by the steady growth and onward march of tender little cells that in their sinuous course follow the lines of least resistance. The attack once opened they expand with enormous power, making room for fresh aggression. There is a lesson for students in this; if you meet difficulties and obstructions, do not charge them indiscriminately, but compass them about quietly,—by following the line of least resistance you will gain a point here, another there, and at last find sufficient leverage to remove the obstruction. If I were a moralist I should enlarge further upon this doctrine.

The general course of your studies in botany will be to gain an acquaintance with the construction and external conformation of plants—with their physiology and chemistry, and also of the systematic arrangement of plants, their genera and species. Good manuals of botany are not unfrequently rather heavily weighted with structural details somewhat repellent to the general student, but here you have the advantage of receiving direct from the professor instructions as to the necessary amount of detail required for the intelligent comprehension of your subject. It is not for me to indicate any mode of study, but as I have somewhat playfully alluded to the lives and habits of plants, it seems to me that the best advice I can give you is constantly to bear in mind that a plant is a living existence, and that all its parts are formed and fashioned for some purpose connected with its life. Some people take up the leaf of a plant as if was a piece of leather with some lines on it. "How pretty!" say they, "it looks as if it was stamped;" but when you know that it is, as it were, one of the lungs of a plant, you have a direct interest in learning its construction, its anatomy, and how it breathes.

My second and last piece of advice is, always to obtain specimens, especially of British plants, whenever possible, for private study; and by all means accustom yourself to the use of the microscope.

It is sometimes asked, Why should we as pharmacists study botany? I answer that plants are an important part of the apparatus of the great laboratory of nature, and in them is made a large proportion of the substances we as pharmacists employ. By vegetable alchemy are produced gums, sugar, wax, oils fixed and volatile, resins, etc., and also those active medicinal properties residing in many parts of plants, which may in certain cases be isolated as alkaloids. The knowledge of new plants and of new products increases, and it seems to me that materia medica and botany are indissolubly linked together.

But vegetable chemistry is not altogether occult. The action of diastase, by which starch is converted into sugar, has long been known and turned to account; and recently there has been discovered in beet-root juice a ferment which has the remarkable property of converting sugar into cellulose or woody fibre. That the laboratory of nature is constantly at work is shown by the evidence of photographic pictures of foliage. In this case a portion of the energy of the chemically active part of the sun's rays is absorbed by the leaves, and is used in the work of the decomposition of carbonic acid and water. In consequence of this the salt of silver on the photographic plate is not decomposed, and the result is seen in the dark, almost black colour of the foliage in the picture.

Within the last few years chemists have succeeded in preparing artificially a number of what were formerly supposed to be exclusively organic products, and it is now known that those naturally formed in plants do not owe their origin to any mysterious energy, but that the materials of which they consist are subject to the same laws as mineral matter. But I cannot enter upon this deeply interesting subject. My object, as I at first stated, was to bring before you a few points of interest which might have a more or less direct bearing upon the sciences of chemistry and botany, and which I thought would to some extent show that there was a charm in these studies for their own sake. If I have to any extent succeeded, my object so far will have been gained, and I leave you to discover for yourselves the beauties of materia medica and pharmacy. I said also that my remarks would be desultory, a mere skimming over the surface, and I must apologize to some of my friends present for a want of precision in some of my statements.

And now, gentlemen, I beg to thank you for your patient hearing, and commend you to the excellent instructions of your professors, trusting that if the Council so wills and the fates decree, I may meet some of you again in another room of this house, and that our meeting and parting may be equally pleasant with the present.

At the conclusion of the Address,

Dr. Greenhow rose to propose a vote of thanks to Mr. Southall for his very philosophic and erudite address, from which he could not doubt many young men would gather some of the suggestions he wished them to gather and learn to love chemistry and botany for their own sake as well as for the sake of making progress in their business calling. He had listened with great interest to the reports of the professors, and it was very gratifying to hear the high standard of marks obtained by the competitors for prizes: it showed that the students of that school were pressing onward in the pursuit of science, and were not satisfied with merely acquiring so much knowledge as would enable them to pass the Major or Minor examinations. The latter was only a test of the minimum qualifications required of a person who was to perform the important duties of dispensing prescriptions; but the gentlemen who had gained prizes showed an amount of knowledge far exceeding that necessary to pass this examination. He agreed with what had been remarked by a previous speaker, that the School of Pharmacy was valuable as a sort of model on which others might be founded, and he hoped there would be such a number of these schools carried on in the same spirit, as would encourage competition, and thus secure excellence in teaching. Mr. Carteighe's remark that on some future occasion he hoped the examiners would be able to award the Council prizes to gentlemen who had been educated in some comparatively unknown school was but another mode of expressing the same wish. Before sitting down he wished to say, as Government visitor of the examinations, that they were conducted in the fairest possible manner; they were not too strict, nor did they go too much into science, as was sometimes said. A man could not be a pharmacist without science. It was an easy thing, perhaps, to compound a prescription if a man had all his drugs ready to hand; but the public required more knowledge than that—a knowledge of the genuineness of drugs, and of plants, and this could only be acquired by a thorough knowledge of chemistry, materia medica, and botany. In conclusion, he thought Mr. Southall deserved great credit for having succeeded in striking out a novel line of address—no easy task, considering that such addresses had been given year after year for so long a period—and one which, if novel, was very useful, and would no doubt have the effect of striking out some sparks of love for science in the minds of his audience.

Parliamentary and Law Proceedings.

Extensive Robberies of Patent Medicines, etc.

At the Birmingham Public Office, on Friday, Sept. 28, Jacob Hugh Payne, 26, chemist, 15, Princess Road, was charged with stealing a large quantity of patent medicines belonging to his employers, Messrs. Philip Harris and Co., wholesale chemists, of the Bull Ring; and Sidney Willliam Parker, 36, parcel clerk, Victoria Terrace, Birchfields, and Horace Bygrave, 41, traveller, of Norwich, were charged with feloniously receiving the same. Mr. Powell appeared for the prosecution, Mr. Cheston, for Bygrave and Parker, and Mr. Bickley for Payne.

Mr. Powell stated that the prisoner Payne had been employed by the prosecutor as warehouseman, his duty being to receive parcels to label them, and compare them with the invoices, but not to send anything out under any circumstances. On the 6th ult., Parker, who was manager at the Globe Parcels Office, Birmingham, went to a Mr. Brown's, chemist, of Hockley Hill, and produced a quantity of patent medicines, telling Mr. Brown he had been sent by the Globe Parcels Company to dispose of them at 25 per cent. under cost price, as they had been received for a debt from one of their agents. Believing the representation to be correct, Mr. Brown purchased the goods. On the 14th ult. Parker called at his shop again with some more goods, which Mr. Brown purchased under similar circumstances. A short time subsequently one of the prosecutors' representatives called upon Mr. Brown for the purpose of obtaining an order for similar goods. Mr. Brown said he should not want any more for a considerable time, as he had been making purchases from Parker at a much lower price than he could get them from the prosecutors. This led to inquiries being instituted, and it appeared that the prisoner Payne on the 4th ult. had sent a parcel from the prosecutors' warehouse to Parker's, whose place of business was in Temple Street. Upon that Mr. Heeley, of the firm of Messrs. Harris, called the prisoner (Payne) into the office and questioned him about the parcel, the result being that he was given into custody. The matter was placed in the hands of Detective Seal, who had an interview with Parker and took him into custody. The two prisoners were taken before the magistrates and remanded. Payne subsequently made a clear breast of the transaction to Mr. Heeley. His statement inculpated Parker and the prisoner Bygrave, who was accordingly apprehended. The latter when arrested said he had been drawn into it by Payne, who had requested him to take a shop for the disposal of the goods he said he could purloin. Payne said to him on one occasion, "I can get about £100 worth of goods a week, as it is all under my control and is only yet in its infancy."—Prisoners all pleaded guilty to stealing. Payne was committed to gaol for six calendar months, and the other two to four months with hard labour.—*Aris's Birmingham Gazette.*

Poisoning by Opium.

On Wednesday, September, 19, an inquest was held at Battersea, on the body of Minnie Heath, eleven months old, before Mr. Carter.

The mother of deceased said that on the previous Saturday morning she gave deceased a pill. On the previous day the child was affected with bad breathing, and had the diarrhœa, and she took her to Dr. Cronin, a homœopathic doctor, of Clapham Common, who gave her some pills, and ordered her to give the child one every two hours. He also gave her three, at the time she was at the house. As the diarrhœa did not continue she did not give the deceased any pills during the night. On Saturday morning as her husband was about to leave home, witness, who was in bed with the child, asked him to give her the pills, and he then gave her a box containing some pills. She gave one to the child, who immediately after began to choke, and she at once saw that she had given the child the wrong pill. She had given one of the pills which were given her about twelve months before to lull the pain in her legs, which were then very bad. The two boxes of pills were placed in conspicuous places, one lying on the shelf and the other on a chest of drawers.

Robert Fair Fraser, a surgeon, said he saw deceased on Saturday; her breathing was then very feeble, and her face was of a livid hue. The mother of the child told him she had given the child the wrong pill. He had supplied the mother the pills, which contained opium, as at that time she was in great agony. The pills contained one grain of opium in each He managed to revive deceased for a short time, but it died from the effects of opium on the same evening.

The jury returned a verdict of "Accidental death."

Poisoning by Carbolic Acid in a Workhouse.

An inquest was held on Saturday, Sept. 29, before the Liverpool deputy borough coroner, touching the death of Emma Greenwood, aged 44 years, an inmate of the Brownlow Hill Workhouse. It appeared that on the previous Thursday, Miss Spicer, the ward matron of the receiving-house, found that she had run short of cough mixture. For the purpose of getting a fresh supply she made application in the usual way, and sent down the empty cough mixture bottle by an inmate. The bottle was given to Mr. Hunt, the dispenser, and he proceeded to fill it, when his attention was called away. On returning he inadvertently filled a bottle containing carbolic acid, which was standing close by the bottle marked "cough mixture."

The messenger at once returned with the bottle given him, but the officer who usually received the medicines from him was absent, and he handed it to an old woman named Catherine Cain. Having a cough, the old woman said she took a little drop out of the bottle, and finding it warmed her very much, she handed it to the deceased, who was cleaning windows at the time, remarking that "it would do her good." The deceased then drank twice, according to Cain's evidence, from the bottle, became unconscious, and soon afterwards died. The jury returned a verdict "That the deceased was accidently poisoned," and accompanied their verdict with a presentment that there had been very gross carelessness on the part of the dispenser, and that in public institutions like the workhouse more care ought to be taken, so that such fatal mistakes would be impossible. The jury also said they quite agreed with the coroner that carbolic acid should not be kept in bottles the same size and of the same colour as those used for less fatal medicines.—*Liverpool Daily Courier.*

Correspondence.

ILLEGAL TRADING UNDER THE PHARMACY ACT, 1868.

Sir,—One of the earliest published objects of this Association was to defend the trade from encroachment by unauthorized dealers in poisons, and as the Association has now been in existence upwards of twelve months, it may interest many of your readers to be informed of the steps that have been taken to effect this object.

I have been repeatedly instructed by the Executive and Law Committees to collect evidence of infringements of the Pharmacy Act, 1868—in other words to make purchases of scheduled poisons from unregistered persons—and report the results to the Registrar of the Pharmaceutical Society. In compliance with these instructions, I have, from time to time, collected evidence of some twenty cases of illegal trading, and forwarded particulars of the same to the Registrar of the Society, with a request that he would submit them to the Council. The cases have been duly laid before the Council, but in no single instance, as far as I am aware, have proceedings been taken against the offenders, although in one case I have on two occasions—at an interval of several months—made purchases of poison from the same person.

What has been done is this: The Registrar, acting under the instructions of the Council, has written the offenders a "caution letter," informing them that he has received information that they are dealing in poisons contrary to the provisions of the Pharmacy Act, 1868, and giving them notice that unless they desist from so doing proceedings would be taken against them.

Now, in some instances, traders infringe the Act in ignorance, when the caution letter possibly puts a stop to the evil; but in the majority of cases I am convinced the statute is being wilfully broken and then such a letter does mischief, inasmuch as the illegal trading still continues and it then becomes a most difficult matter for *a stranger* to obtain the requisite evidence on another occasion. In proof of this, I have three times during the last six months purchased a scheduled poison from a person openly infringing the Act. On the 30th of June last I reported this case to the Registrar of the Society forwarding him particulars of the third purchase; the offender was warned in due course; on Thursday last I endeavoured to make a fourth purchase of poison from the same establishment, when the assistant refused to sell it me, saying they had ceased to sell poisons except to persons they knew as customers.

It is an admitted fact that there are at the present time a large number of persons contravening the provisions of the Pharmacy Act in this country, the Registrar himself admits that "the Council has no idea of the enormous number of cases constantly reported to him, there was scarcely a day which did not bring information of some alleged infringement." (See Report of Meeting of the Council, July 4, 1877, *Pharmaceutical Journal*, No. 367, page 14.) I am continually receiving letters from members, reporting cases and soliciting my aid to put a stop to them. In many instances the Executive Committee of the Association would have instituted proceedings against the offenders under the 15th section of the Act, but the authority to take action under this section is vested in the Registrar of the Pharmaceutical Society who can sue only "in the name and by the authority of the Council of the said Society."

The Council of the Society having taken no steps to make use of the evidence collected at the expense of the Association, beyond warning the offenders, the Law Committee, at their meeting on the 3rd ultimo, unanimously resolved to take action, under the 17th section of the Act, against illegal traders who were selling poisons improperly labelled, and instructed their solicitor to proceed in such cases as he thought expedient.

The first prosecution took place at Walsall on the 26th ultimo, a full report of which appeared in your last issue; the result was highly satisfactory as unmasking the proceedings of an unregistered person trading under the cloak of a duly registered chemist and druggist. I have taken out summonses against two persons residing in this town, who, I believe it will be found, are infringing the Act in a similar manner. The cases will be heard at the police court on Tuesday next. A report of the proceedings shall be forwarded to you in due course. The effect of such prosecutions will probably be to cause unregistered men, when selling scheduled poisons, to declare distinctly on the covering of the packet, bottle, or wrapper containing the poison their name and address, when it will be an easy matter for the Council of the Pharmaceutical Society to sue under the 15th section of the Act, provided that the Council deem it expedient to proceed against them.

W. F. HAYDON, *Secretary.*

Birmingham, Oct. 3, 1877.

THE CONFERENCE GRANTS.

Sir,—As regards research-grants, Dr. Tilden regrets the abruptness with which the "altered views" of the Conference were expressed by me at Plymouth. The future welfare of the Conference induces me to ask you to give me space to assure all interested in the Conference, that the Conference, so far as I know, has not altered its views in the slightest degree.

JOHN ATTFIELD.

Ashlands, Watford, Oct. 14, 1877.

TO THE BENEVOLENT.

Sir,—Allow me to thank you for the publicity which you have given to the case of Mrs. Fowler, and to add to the amount already announced, viz.:

	£	s.	d.
	50	4	0
Mr. Barclay, Birmingham	0	10	6
,, Hullell (Meggison and Co.)	1	1	0
,, Reynolds (Leeds)	0	10	6
,, W. Wickham, 509, New Cross Road	0	5	0
	£52	11	0

Since the first appeal was made, Mr. Bremridge and I have endeavoured to obtain sufficient evidence to justify us in taking legal proceedings against the railway company, but the long time that has elapsed since the accident occurred, and the subsequent information obtained from a reliable authority that the present mental affliction of Mr. Fowler may be hereditary, and not the result of the accident, has induced us to think it would be a great risk to venture on law proceedings. This being the case I would rather, with the consent of the subscribers to the fund, apply the amount received in a way most likely to benefit the poor woman.

The fund will, therefore, be so appropriated unless any objection is made by the subscribers before the 1st of November next.

W. D. SAVAGE.

"*Dispenser for more than Twenty Years.*"—Quite as much would be implied in the instruction "Misce."

A. T. Green.—The book is published by Groombridge, Paternoster Row.

"*Medicus.*"—See a paper by Mr. Pocklington on the preparation of glycerine jelly for microscopical purposes, in *Pharm. Journ.* [3], vol. v., p. 401.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Hemstead, Mr. Dunn, Dr. Brown, Mr. Whitfield, Mr. Milner, Mr. Pearce, Mr. Smith, Mr. Abraham, Mr. J. T. Fox, Mr. Wallis, Mr. Masson, Mr. Hicks, Mr. Gale, Mr. Gibson, Mr. Gibbs, Syrupus, McFigo, Natura, Gulielmus J. S.

GLYCERINUM TRAGACANTHÆ, AS AN EXCIPIENT.

BY G. WELBORN.

The subjoined remarks are in continuation of a paper read last year at the Pharmaceutical Conference at Glasgow, and printed in the *Pharmaceutical Journal* of September 23, 1876.

(1) The present condition of a mass of Pil. Aloes et Ferri weighing about two ounces, and prepared on May 26, 1876, is as follows:—Aroma, very good and fresh; consistency, rather hard, but yields to pressure of the thumb and fingers. A section exhibits numerous minute crystals of ferrous sulphate interspersed throughout the mass. A portion being cut off from the mass and rolled upon a pill-machine, crumbles down and does not admit of being formed into pills. Nevertheless, if it be worked for a short time under a pill-pestle it still forms an exceedingly good and plastic mass—capable of easy extension for cutting into pills, which are beautifully rounded off, and present the appearance of having received a coating of varnish. I may add that the above mentioned mass retained its original consistency for some six months, until, in fact, it had been exposed for some time to the heat of a very warm room during last winter.

(2) A small mass (about one ounce) of Pil. Aloes et Myrrhæ, prepared twelve months ago, has become too hard to roll out without being first subjected to some amount of labour in the pill-mortar. It then becomes soft and plastic, but displays a want of adhesiveness apparently due to the essential oil contained in the myrrh, so that, when the pills are cut they frequently split into halves. The aroma of the mass is as fresh and powerful as when first compounded.

(3) A small mass of Pil. Rhei Composita, now fifteen months old, still retains a nice consistency, and may be readily cut with a pill-knife. It does not, however, roll well, the cause of failure manifestly being due to the oil of peppermint, since the oil has a tendency to ooze out and form a non-adhesive surface. If the precaution be taken of previously working up the requisite quantity of mass in a pill-mortar, it speedily becomes soft and may be readily rolled out.

From a careful consideration of the foregoing observations, it may be gathered, that although the glycerin and tragacanth excipient preserves certain of the official pill-masses in good condition for a much longer period than those ordered in the Pharmacopœia, yet it has not altogether sustained the expectations formed of it; for while it succeeds admirably—nothing better, for making up nine out of every ten of physicians' prescriptions met with in the daily routine of a dispensing establishment, it must be confessed that the official formulæ thus prepared gradually assume a condition, after being kept several months, which necessitates the use of the pill-mortar before they can be formed into pills.

I avail myself of this opportunity for saying that the grounds for a statement contained in my letter which appeared in the *Pharmaceutical Journal* for October 14, 1876, respecting a mixture simply of glycerin and powdered gum tragacanth, that it does *not* gelatinize in the cold, was founded on experiments made with a sample of gum obtained from an undeniably first-rate source. The said gum when mixed with pure glycerin did not show signs of gelatinizing after remaining for several hours in contact; and, even after being heated together on a water-bath was not by any means tenacious. The addition of water, however, imparted the quality of adhesiveness to a remarkable degree. Within the past year, however, I have met with powdered tragacanth which assumed a stiff and tenacious condition in a few hours after being mixed with glycerin without the application of heat, in the proportion of one part of gum to six parts of glycerin.

Experiments were undertaken with the view of ascertaining the solubility of pills above mentioned when merely exposed to the action of cold water. Three grains each of the following pills were taken: —Pil. Aloes et Ferri, Pil. Aloes et Myrrhæ, and Pil. Rhei Composita. These were placed in separate test tubes, containing a small quantity of cold water, in the evening, and allowed to stand undisturbed during the night. Next morning the Pil. Ferri and Pil. Rhei had increased in bulk, and upon slightly shaking the tubes the pills were completely disintegrated and diffused through the liquid. The Pil. Aloes et Myrrhæ was not so much acted upon by the water; it was, however, easily broken up and diffused when stirred with a glass rod.

The physiological activity and therapeutic efficacy of pills made up with the tragacanth excipient is placed beyond doubt when taken in the diminished dose of three grains for five grains of the B.P. formula.

As to the important question of defining doses for any amended formulæ which may be inserted in the Pharmacopœia of the future, I would respectfully submit that part of the subject is a matter to be left to the decision of the Committee appointed by the Medical Council for revising our national text-book.

It may, perhaps not be thought irrelevant to observe here, with reference to another excipient for Pil. Aloes et Myrrhæ, that a mixture of one part of glycerin and three parts of treacle possesses the property of preserving the above mass in perfect condition for the space of six years with every probability of keeping good and fresh for another like period.

It is, therefore, a subject worth serious consideration, whether the use of a mixture of glycerin and treacle as an excipient, in easily regulated and suitable proportions might not advantageously be extended to other official pill-masses, *e.g.* Pil. Rhei Composita, Pil. Colocynth. Composita, and Pil. Assafœtidæ Composita.

THE TURPENTINES AND RESINOUS PRODUCTS OF THE CONIFERÆ.

BY DR. JULIUS MOREL,

Professor of Chemistry in the Industrial School, Ghent.

(*Continued from page* 83.)

IV.—VENICE TURPENTINE.

Synonyms.—L.: Terebinthina Veneta; Terebinthina Laricina; Resina laricea; Resina larigna. E.: Larch Turpentine. G.: Venetianischer Terpenthin. F.: Térébenthine de Vénise; Térébenthine de Briançon; Térébenthine de Mélèze: Térébenthine fine ordinaire; Térébenthine de Strasbourg: Térébinthine Suisse.

Botanical Source.—Larix Europæa.

Larix, Plin., Hist. Nat., xvi. 19; Dodon. Prompt., 663; C. Bauh., Pin., 493.
Larix, Bell., De Arbor. Conif., 25 (*ic.*).
Larix folio deciduo Conifera, J. Bauh., Hist., i. 269; Journ. Inst., 586; Duham., Arbr., i. 332.

Pinus Larix, L., Spec., 1420; Tren. in N. A. N. C. (III.), App., t. 13, f. 28; Willd., Baumr. 274; Lamb. Pinet., ed. ii. 60, t. 38; Wahlenb., Fl. Carp, 313; Gaud., Fl. Helvet, vi. 188; Koch, Syn., 769; Aut., Conif., 50, t. 21, f. 2; Endl., Syn. Conif., 133.

Larix decidua, Wall. Dict., No. 1; Henk and Hochstt., Syn. des Nadelh., 129.

Abies Larix, Lam., Illustr., t. 785, f. 2; Rich., Conif., 65, t. 13; Loisel, Nouv. Duham., v. 287; t. 79; f. 1; Lindl. and Gord., Journ. Hort. Soc., v. 213.

Larix pyramidalis, Salisb. in Linn. Trans., viii. 313.

Larix Europœa, DC., Fl. Fr. iii. 277; Loud. Arbor., iv. 2330, f. 2258-2262; Encycl. of Trees, 1053, f. 1972; Forst., Pinet. Wob. 133; Link. in Linnæa, xv. 534; Desf., Hist. Arbor. ii. 597; De Chambr., Tr. prat. Arb. résin., 277, pl. 3, f. 16, 17; Schonn., Ann. Sci. Nat., 3rd ser., ii. 241; Knight, Syn. Conif. 40; Man. des Pl., iv. 344; Tr. Gén. des Conif., 276; Gord. Pinet. 142.

Larix Europœa communis, Laws, Man., 385; Loud., Encycl of Trees, l.c.

Larix excelsa, Link. in Abhandl. der Berl. Akad. d. Wissensch., 1827, p. 182.

Larix vulgaris, Spach., Hist. Vég. Phanér. xi. 432 (excl. syn.).

E.: European or Common Larch.—G.: Lärche, Lärcher Fichte; Gemeiner Lerchenbaum; Terpentinbaum; Europaischen Ceder; Weisser Lerchenbaum.—Méleze commun; Méleze d'Europe.

"The larch will grow rapidly upon almost any soil, and in any situation, for the first 20 or 30 years; but it is only in a clear dry atmosphere, on a cold bottomed soil, somewhat moist on the surface, that its timber is brought to perfection. In plains and near the sea it grows rapidly for 30 or 35 years; but when felled in such situations, the wood is found rotten at the heart, and unfit for any purpose except fuel. This decay of the wood is much aggravated when the larches are planted thick, so as to expose but a small portion of their foliage to the sun, and to retain among their lower branches an atmosphere surcharged with moisture. The larch will grow, and become valuable timber, at a much greater elevation above the sea than the Scotch pine, thriving at a height of 1800ft. in the Highlands, where the Scotch pine does not attain a timber size at a greater elevation than 900ft. In Switzerland it is found in the highest perfection in soil composed of the debris of calcareous rocks, as well as in granite, argillaceous, and schistose soils."

The bark of the larch has very great analogy with that of *Pinus sylvestris*, as well in its exterior aspect as in its organization and mode of development; it is only rather less red and less scaly. It contains utricules which, without having any analogy with the glands of the fir, become filled with resinous matters. The true glands disappear with the green envelope during the earlier years of the life of the larch.

Extraction.—It is essentially in the various layers of the sap wood that the resiniferous canals are met with; the bark contains but very few, and these are but little developed. According to Flückiger and Hanbury, "larch turpentine is collected in the Tirol, chiefly about Meran, Botzen, and Trent. A very small amount is obtained occasionally in the Valais in Switzerland, and in localities in Piedmont and France, where the larch is found. The resin is obtained from the heart wood, by making in the spring a narrow cavity reaching to the centre of the stem, at about a foot from the ground. This is then stopped up until the autumn of the same or of the following year, when it is opened and the resin taken out with an iron spoon. If only one hole is thus made, the tree yields about half a pound yearly without appreciable detriment. But, on the other hand, if a number of wide holes are made, and especially if they are left open, as was formerly the practice in the Piedmontese and French Alps, a larger product, amounting to as much as 8lb., is obtained annually, but the tree ceases to yield after some years, and its wood is much impaired in value.

"Mohl, who witnessed the collection of this turpentine in the Southern Tirol, observed that when a growing larch stem was sawn through, the resin flowed most abundantly from the heart-wood, and in smaller quantity, though somewhat more quickly, from the sap-wood, and that the bark contained but few resin-ducts. The practice of closing the cavities is adopted, not only for the sake of preserving the wood and for the greater convenience of removing the turpentine, but also because it tends to maintain the transparency and purity of the latter."

A tree 50 or 60 years of age can yield 3 to 5 kilograms of turpentine annually for 5 or 6 years in succession, if care be taken to reclose the cavities exactly for the winter.

Characters.—Venice turpentine, freed from all its impurities, is a thick liquid of a pale yellow colour and slightly fluorescent. It is very slightly turbid, and neither granular nor crystalline; it always remains translucid. Its odour is less pronounced than that of common turpentine, recalling slightly the scent of nutmeg, but less agreeable. The taste is acrid, bitter and aromatic. Planchon remarks that this bitterness is perhaps due to a principle named "pinipicrine," the presence of which has been recognized in the needles of the *Pinus sylvestris* and of certain Thujæ.

Venice turpentine, of all the turpentines, presents the least decided siccative properties. When spread in thin layers it thickens very slowly in contact with the air; but there is no doubt that desiccation does take place, and that Herlant is wrong in considering it a non-siccative turpentine. Moreover, this author sets at nought its proper classification and ceases to be exclusive in his description when he says that the product remains sticky indefinitely, or at least during a very long time.* When it is mixed with calcined magnesia, it does not acquire a pilular consistence.

Venice turpentine is completely soluble in alcohol, forming a clear solution that reddens litmus. When treated with cold water the resulting liquor also has a slightly acid reaction, which is due to formic acid and probably to succinic acid. It is perfectly miscible with glacial acetic acid, alcohol and acetone. Dissolved in benzine or in alcohol it rotates the plane of polarized light 9·5° to the right; this rotatory power, however, is due to the resin it contains, since the essential oil is lævogyre to the extent of 6·4°.

Composition.—By submitting Venice turpentine to distillation there is obtained about 15 per cent. of an essential oil that boils at 157°C., and which when saturated with hydrochloric acid gas yields crystals having the composition $C_{10}H_{16}+HCl$. The resin that is obtained as a residue of the distillation is soluble in 2 parts of hot 75° alcohol, but is much more soluble in concentrated alcohol. Berzelius examined a "Venice turpentine," but it is not certain that he had to do with a genuine specimen, as the name was also borne by the turpentine from *Pinus maritima*.

Unverdorben has analysed a true specimen quite recently. According to that chemist, Venice turpentine contains two essential oils, one being much

* Etude sur les Principaux Produits Résineux des Conifères, p. 19.

more volatile than the other; two resin acids (pinic and sylvic); a neutral resin; a bitter extract; and, finally, succinic acid mixed with a little formic acid. Pinic acid is present in considerable quantity and this explains why it is that this turpentine is not granular (crystalline).

Uses.—According to Merat and De Lens, Venice turpentine is the best and the only one that should be used in medicine. However, its employment in this direction is very restricted, other turpentines being much preferred to it; in fact, as a rule the product met with in commerce under the name does not merit recommendation, as it is frequently nothing more than a mixture of common resin and oil of turpentine. This mixture is easily distinguished from Venice turpentine, because it possesses very marked siccative properties and its odour is more decided. In the pure state Venice turpentine would merit preference in the preparation of plasters, because it is so slightly siccative.

V. HUNGARIAN BALSAM (*Térébenthine de Hongrie*).

This turpentine is yielded by the dwarf or mountain pine (*Pinus Pumilio*, Harnck). It is still known under the name of Hungarian balsam (*baume de Hongrie*). It is a pale yellow, clear liquid, having an herbaceous odour and a piquant flavour. At present it is scarcely met with in commerce.

VI. CARPATHIAN BALSAM (*Térébenthine des Monts Carpathes*).

This turpentine is yielded by the *Pinus Cembra*, L., known in this country as the Cembran Pine, or the Siberian or Swiss Stone Pine; in Germany, under the name of *Zürbelkiefer;* and in France as the *Cembrot*, *Gouve*, *Tinier*, *Aloies*, or *Auvier*.

The tree attains a height of from 19 to 20 metres, and grows at a very considerable altitude, 2000 metres at least, forming the last zone of forestal vegetation. In France it is met with only in the Brionçonnais Alps, and even there it shows a tendency to disappear. Its bark is of a greenish grey colour, smooth or warty, presenting resin reservoirs that can be emptied.

The turpentine is liquid, colourless, and limpid; it has a pleasant odour, and an acrid and bitter taste. It is rarely met with in commerce.

VII. TURPENTINE FROM THE ALEPPO PINE (*Pinus Halepensis*, Mill. *Pin d'Alp; Pin de Jérusalem; Pin blanc*).

"In Provence this pine is tapped in the same manner as the maritime pine in the West, and the same products are obtained, but of less value. In general the tree is tapped when it has obtained the dimensions of 20 or 30 centimetres in diameter. If properly attended to, it will yield for 19 or 20 years 6 or 7 kilogrammes of turpentine annually per tree. The notches which are made in the bark to induce the flow of the sap are about 10 centimetres wide, and are called "surlés." Every 19 days the flow is invigorated by a small fresh cut at the upper part, until, in the course of the year, the incision or notch reaches the length of 30 centimetres. The turpentine is received in holes opened in the earth at the foot of the tree. It is known under the name of *Périme Vierge*. After preparing and cooling in cakes the resin so obtained is called "*rare.*" After exhausting the tree for turpentine, the trunk and root are distilled for tar, etc."

(To be continued.)

A NEW PROCESS FOR THE PREPARATION OF EXTRACTS WITHOUT HEAT.*

BY PROFESSOR ALPHONSE HERRERA.

Since the progress of organic chemistry has made us acquainted with many proximate principles of plants and their various properties, the processes for most medicinal preparations have been considerably improved, and diverse apparatus and methods have been designed with the view of obtaining them in a more energetic form and of preventing the alteration of the proximate principles, as well as to secure greater economy and a more convenient form for their administration. Of all the medicinal preparations none have attracted more the attention of the pharmacists than the extracts, which offer the advantage of being conveniently administered, and, if well prepared, of representing in a small bulk the properties of the drugs. By the action of heat and air the organic principles are generally more or less altered, and hence in the ordinary way of preparing extracts, the active ingredients are more or less modified, or if volatile, evaporated, and the preparations do not fully represent the drug. To obviate this difficulty, it has been proposed to evaporate the liquids at rather low temperature, and if possible excluded from contact with the air, and with these objects in view, ingenious apparatus and contrivances have been adopted,—like evaporating in many capsules heated by steam, as in the process of Henry; or keeping the liquid continually in motion to promote the evaporation, as in the process of Bernard; or effecting the concentration *in vacuo* by means of special apparatus, constructed by Laurent, Granval, Berry and others.

I do not propose to discuss the advantages or disadvantages of the different methods proposed, for they are well known. It merely remains to state that the best results have been obtained by evaporation *in vacuo*, in which process the exclusion of air and the low heat prevent any great alteration of the soluble principles; but the high price of such an apparatus is a great obstacle to its general use.

For many years, sodium chloride and ice have been employed in Europe with the object of utilizing the property of water when freezing to separate the salts which are contained in solution. In 1862 Robinet presented to the Paris Academy of Medicine a memoir, in which he demonstrated the application of this behaviour in the analysis of waters. Afterwards Mr. Ossian Henry applied it to the concentration of mineral water for the purpose of facilitating its transportation. I have utilized the same property for the concentration of vegetable juices, and, in general, of aqueous solutions of organic principles.

The results of my observations have satisfied me that, when the water partially congeals, the dissolved principles remain in solution in the mother liquors, and that two or three congelations are generally sufficient for obtaining the solutions concentrated enough to finish the extract by exposure upon plates to the heat of the sun or of a drying closet, heated to about 30° C. (86° F.) The extracts prepared by this method accurately represent the properties of the plants, and the principles which are changed by the influence of heat remain unaltered; even the volatile constituents are not dissipated, though most of the water be removed by freezing. Owing to the small cost of the necessary apparatus, it appears to me that my process for preparing extracts should be preferable even in those countries where ice is less readily obtainable than combustibles.

Extract of conium, prepared with unpurified juice by the process mentioned, has preserved the characteristic odour of conia, and by dissolving it in water I have obtained a solution exactly representing the juice of the plant in appearance and properties, and giving, when heated, an abundant coagulation, proving that even albu-

* From the *American Journal of Pharmacy*, September, 1877.

men had remained unaltered. 1750 grams of cow's milk, of 9° B., left, after three congelations, 750 grams of a liquid having a density of 14°, and by evaporation in the sun this left a dry extract of milk, which again formed that liquid on being dissolved in water. A number of other liquids, similarly treated, gave corresponding results, and it seems to me, therefore, that medicinal extracts are best prepared by congelation. It may be objected that the vegetable juices should be previously purified; but it should be remembered that coagulated albumen always encloses a considerable portion of the active principles, and that the heat necessary to effect the coagulation and the evaporation by means of a water-bath is sufficient to change many principles; also, that the extracts thus prepared are sometimes inert or less active. The careful experiments made by Orfila and the clinical experience of others demonstrate that extracts prepared with unpurified juice are stronger.

The results of the experiments just mentioned will show that my process may be advantageously used for the preservation of vegetable juices, which are obtained by dissolving the extract in sufficient water until the solution is of the same density as the natural juice. The method is also advantageous in the preparation of syrups in serving to properly concentrate the liquors from which the syrups are made.

For the extracts prepared from juices by the method indicated, the author proposes the designation of opopycnols (opopicnolées), derived from the two Greek words *οπος*, the juice, and *πυκνοω*, to condense.

In obtaining artificial extractive solutions, the process of infusion should be used, unless the active principles are sparingly soluble in water, in which case digestion or even decoction may be resorted to, but in whichever way obtained, the solutions are treated alike for preparing the extracts. Extract of rhatany, prepared by the process of congelation, dissolves completely in water, with a red colour, and has a much more astringent taste, compared with the extract which was prepared with the utmost precaution by evaporation in a water-bath. Similar comparisons were made with the extracts of catechu, aloes and others, and in all cases a very notable difference was observed, which is explained by the final evaporation in the proposed process being conducted by the heat of the sun or of the drying closet, which is insufficient to effect a change or to volatilize the volatile principles in any appreciable degree.

The apparatus employed by me is the so-called sorbetière;* for larger quantities the apparatus of Gougaud is preferable. The frigorific mixture is composed of ice and sodium chloride, or preferably of crystallized calcium chloride. After a large portion of the solution has congealed, the mass is enclosed in a cloth and subjected to pressure, the presscake of ice is broken and again pressed, to separate the mother liquor as completely as possible, and the congelation is repeated two or three times, with the precaution that it be not carried far enough to cause the precipitation of the sparingly soluble principles. The mother liquor is then put into shallow dishes and exposed to the heat of the sun or of a drying room, the temperature of which does not exceed 30° C. (86° F.) until the extract has attained the desired consistence.

In conclusion, it may be stated that the concentration of aqueous solutions by congelation appears to be preferable—

1. For the preparation of aqueous extracts in general.
2. For the preparation of syrups containing juices, in which case the concentration should be carried far enough that after mixing with the simple syrup the requisite density is obtained.
3. For the conservation of juices, and
4. For chemical analysis the process may be used with advantage.

* Similar to the apparatus used for ice-cream.

SOPHORA SPECIOSA (BENTH.).*

This newly described medicinal substance is a small red bean, irregularly oval or roundish, about one-third of an inch in length, and having a slightly bitter taste, with an after-feeling of numbness when chewed. Some of these beans have been sent to the Smithsonian Institute, at Washington, by Mr. Edmund Billinger, sen., of Texas, who stated that they were occasionally used by Indians in the neighbourhood of San Antonio, South-western Texas, as an intoxicant; that a half-bean would produce delirious exhilaration, followed by sleep lasting two or three days; and that it was asserted that a whole bean would kill a man.

Some of these beans having been sent to Professor Horatio C. Wood, of Philadelphia, he obtained other samples from Mr. Billinger, and together with the latter some of the flowers of the plant. Dr. Rothrock, Professor of Botany in the University of Pennsylvania, after an examination of the latter, pronounced the source to be the *Sophora speciosa* of Bentham.

Professor Wood has obtained a small amount of organic principle from the beans, which is extremely active as a poison, the minutest speck producing, in two minutes, almost entire paralysis in the frog. One-twentieth of a grain of a very impure specimen produced, in a half-grown cat, deep sleep lasting many hours.

As the substance is not soluble in water, but is soluble in acidulated water, and is precipitated by alkalies, and as it dissolves freely in ether, imparting to it a decidedly alkaline reaction, Professor Wood looks upon it as an alkaloid, and gives it the name *sophoria*.

The sample obtained by Dr. Wood was of greyish white colour, but he did not succeed in crystallizing either it or its acetate. Its reactions, so far as he had examined them, were as follows (the tests being made by placing a speck of the alkaloid upon a porcelain plate and applying the reagent):—

With concentrated sulphuric acid, no colour.

With chromic acid and concentrated sulphuric acid, a dirty, deep purple, passing rapidly into bright green, then into bluish, and finally into yellowish brown.

With tincture of chloride of iron, a deep almost blood red, after a time acquiring an orange tint.

With nitric acid, no colour.

With chromic and nitric acids, a very faint evanescent, reddish colour.

With nitro-muriatic acid, a dirty, reddish brown.

From the solution of its acetate, compound tincture of iodine throws down a yellowish precipitate.

The experiments, made by Dr. Wood upon lower animals, with a view to determining the effects of the remedy upon them, show that frogs rapidly lose reflex activity and power of voluntary movements. Further experiments demonstrated that this effect was due to the action of the drug as a spinal sedative, and that it had little or no effect upon either motor or sensory nerves.

Upon *mammals* the effect varies somewhat according to the dose. An amount of the extract estimated at two grains produced in a full grown cat, in one minute, marked weakness in the hind legs; in two minutes, inability to stand, with evident effect upon the respiration; in three minutes, convulsive movements, with loss of consciousness, continuing with increasing embarrassment of breathing for three minutes, when all attempts at respiration ceased. The heart kept on beating for one and a half minute longer. The pupils were unaffected at first, afterwards dilated. In small quantity the extract produces, in the cat, vomiting, great muscular weakness, profound quietude, and deep sleep lasting some hours and ending in recovery. Similar symptoms occurred in dogs. Death always took place through stoppage of respiration, In a single cardiac experiment the drug had no decided effect upon the blood-pressure until towards death, but appeared to accelerate the heart-beat.

* *New Remedies*, from the *Medical Times*.

The Pharmaceutical Journal.

SATURDAY, OCTOBER 13, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal. MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE CAUSE OF PUTREFACTION AND LACTIC FERMENTATION.

IN delivering the inaugural address at King's College Medical School last week, Professor LISTER adopted a novel course towards such an audience, and instead of occupying the time at his disposal with the usual recommendations to the students about to enter upon their medical curriculum, he preferred to treat of a special subject in the hope that he might be able to say something which should interest and possibly instruct his audience. The subject chosen by Professor LISTER is one that has long been of deep interest to the cultivators of several branches of science, and his own efforts to make a practical application of the knowledge acquired by studying the phenomena of fermentation have given to that subject a wider significance than it had before.

The particular kinds of fermentation which were the subject matter of Professor LISTER'S address were those which take place in blood and in milk the question to which his attention had been directed having regard to the cause of the change which takes place when either of these liquids is kept for some time in contact with the air. In the case of blood the fermentation which ensues under these conditions is of the kind termed putrefaction; in the case of milk it is characterized by the formation of lactic acid, and is consequently termed lactic fermentation. In the experiments by which Professor LISTER sought to illustrate the nature of the changes which take place in these liquids care was taken to collect both the blood and milk in such a manner as to exclude the access to them of living organisms. It is unnecessary here to enter upon a description of the precautions observed to attain this result, the important fact being that blood so collected had been kept for six weeks without undergoing putrefaction, and that the air in contact with it was quite sweet. From this observation Professor LISTER inferred not only that blood has no inherent tendency to putrefy, but also that atmospheric oxygen is not capable of causing it to putrefy as has been supposed. Some kind of action was exercised by the oxygen upon the blood, as was indicated by the change of colour from that peculiar to venous blood to the crimson colour of arterial blood, but it was not until the blood thus preserved had been touched with an extremely minute quantity of putrescent blood on the point of a needle that putrefaction commenced.

The result in this case was exactly parallel to that which takes place in alcoholic fermentation, and the inference is that putrefaction is in fact a kind of fermentation characterized, like the alcoholic fermentation, by the reproduction of the ferment by which the change is produced.

As is well known there is a conflict of opinion on the point whether the bacteria which are unquestionably constant concomitants of certain kinds of fermentation are also the cause of the change or merely accidental. It was suggested by Professor LISTER that one of the causes of doubt as to the influence of bacteria in causing fermentation is the extreme minuteness of these organisms.

With the object of investigating this question more fully, experiments were made with another form of fermentation, that of milk, which on exposure to the air turns sour and curdles; the sugar it contains being converted into lactic acid. At the same time microscopic observation always reveals the presence of minute organisms of the nature of bacteria in the coagulated milk. By collecting a number of samples of milk in separate glass vessels, with suitable precautions to prevent the access of organisms, the milk in a few of the glasses was found, after some weeks, to be entirely free from change, destitute of any acid reaction, and under the microscope no indications of the presence of bacteria were to be found.

The next step in the investigation was to find evidence to decide whether the particular bacterium found in sour milk was or was not the cause of the lactic fermentation. For this purpose, Professor LISTER endeavoured to estimate the number of bacteria in a given quantity of sour milk by placing one-fiftieth of a minim of the milk on a slide, and counting the number of bacteria in the field; then by diluting the milk to such an extent that a single drop of the liquid would probably contain, on the average, one bacterium, a liquid was obtained, with which a number of separate quantities of boiled milk were inoculated by adding a single drop of the liquid. The result was that out of five glasses of milk treated in this way only one curdled, and on examination that one was found to contain the bacterium lactis, while the four others, which did not curdle, had no bacteria in them.

In another series of experiments, five specimens of milk were each inoculated with a drop of the liquid calculated to contain two bacteria; other five specimens were inoculated with drops calculated to contain one bacterium; another set of five open glasses were inoculated with drops calculated to contain one bacterium; and one with a drop calculated to contain four bacteria. The result was that the last specimen curdled in a few days, and all those calculated to have two bacteria curdled in a few days.

Of the five glasses calculated to have one bacterium, three remained liquid. On opening one of these glasses the milk was found to be perfectly sweet; it had a slight flavour of suet, similar to that which PASTEUR has described as resulting from the oxidation of the oleaginous constituent of milk.

The result of these experiments proves conclusively that the ferment which caused the curdling of the milk was not in solution but in the state of suspended particles, otherwise every drop of the inoculating liquid should have produced the same result. Again, the fact that some drops were destitute of the ferment proves in like manner that it was not in solution.

AMMONIACAL FISH.

A CORRESPONDENT of the *Lancet*, who professes to have a partiality for the skate, tells how he was recently not only disappointed with his favourite dish, but almost suffocated also by the pungency of the ammoniacal vapour evolved when the fish was placed upon the table. Evidently this gentleman's piscivorous propensities have not yet become fully developed, or they suffer from imperfect training, for we have it on authority that this ammoniacal peculiarity is considered by certain *gourmets* to be the crowning excellence of the skate, so much so that they do not eat the fish until it has become sufficiently odorous to be smelt from one end of a ship to the other. However, it will be remembered that a few years ago, a prominent pharmacist, Mr. T. B. GROVES, also failing to appreciate this choice perfume, took his revenge by submitting the fish to distillation with water, and this wrung from it a considerable quantity of trimethylamine, a body which was just then more talked about than it is now.

UNIVERSITY COLLEGE, BRISTOL.

WE have been favoured with a copy of the Calendar of this new educational institute for the West of England, and are glad to notice that some of the arrangements are favourable to the promotion of local pharmaceutical education. During the forthcoming session there will be a course of day lectures on Inorganic Chemistry, and another on Organic Chemistry. The Laboratory will be open daily for instruction in Practical Chemistry. There will also be a course of evening lectures on the Principles of Chemistry and the Non-Metallic Elements, and it is further proposed to form a Practical Class for instruction in Qualitative and Quantitative Analysis, to meet on two evenings a week in the Laboratory. The Professor of Chemistry is E. A. LETTS, Ph.D., F.R.S.E., and the Lecturer is W. W. J. NICOL, M.A. A Botany class will commence after Christmas, to be conducted by Mr. A. LIEPNER; Materia Medica will be taught at the Bristol Medical School, which is in connection with the College.

Detailed information respecting the fees, etc., is given in the Calendar, copies of which may be obtained from Mr. EDWARD STOCK, Secretary to the College.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The annual meeting of the twenty-eighth session was held at the Royal Institution, September 27, 1877.

In the unavoidable absence of the President, Mr. A. H. Mason, F.C.S., Mr. Edward Davies, F.C.S., was voted to the chair. The minutes of the concluding ordinary meeting were read and confirmed.

Mr. Alfred Scott was elected an associate. The Hon. Sec., Mr. Thomas Williams, F.C.S., read the following report of the Council for the past session:

ANNUAL REPORT, TWENTY-EIGHTH SESSION.

"At the termination of the official year, your Council have pleasure in presenting the twenty-eighth annual report of the proceedings. The prosperous working of the Liverpool Chemists' Association has seldom been more marked than at the present time.

"Your Council have elected John Williams, Esq., F.C.S., etc. (President of the Pharmaceutical Society of Great Britain), an honorary member of the Association.

"During the session fourteen members and five associates have been elected, four members and three associates have resigned (owing to removal from the town and inability to attend the meetings) and two members have died, leaving the numerical strength of the Association at the present time 150, comprising 17 honorary members, 122 members, and 11 associates.

"Your Council desire to pay a tribute to the memory of the late Mr. Martin Murphy, F.C.S., whose contributions to the Association, and whose ability in discussions, have done much to maintain its scientific standing. A vote of condolence passed in Council, including that passed at a general meeting, has been duly acknowledged and appreciated by his widow and family.

"Your Council provided a course of lectures in chemistry and in botany; but it is still a matter of regret that the School of Pharmacy does not receive that support from the students in the town and neighbourhood which it deserves. Mr. Thomas Williams, F.C.S., the teacher of chemistry, reports that eight students entered for his classes; their attendance and progress were satisfactory. Five consented to enter into a competitive examination, but when the necessary arrangements for holding this had been completed, it was found that the majority of the candidates had gone to other towns and could not meet together. Two students only attended the botany classes which were held in conjunction with the Liverpool School of Medicine. Lecturer—Dr. Carter, B.Sc., LL.B., M.R.C.P. Lond. Arrangements have been completed for the coming session, in accordance with the notices already circulated, and your Council hope that the next session of the Liverpool School of Pharmacy may be more successful than of late years, and that employers will stimulate and enable students to avail themselves of the privileges offered.

"Your Council desire to acknowledge with thanks the kindness of Professor Attfield in supplying the examination papers.

"During the past session twelve papers have been read on subjects of interest to scientific chemists and pharmacists. The originality and importance of these papers, and the practical discussions which followed, bear very favourable comparison with those of any previous session.

"The 'Miscellaneous Communications' have been numerous and instructive, and give evidence of life in the Association.

"The average attendance at the meetings has been good, and shows increasing interest in the prosperity of the Association.

"The library has been enriched by several additions, including the usual scientific periodicals; and your

Council desire to acknowledge their obligation to Mr. Abraham for his handsome donation of Howard's 'Quinology of the East Indian Plantations.' A revised catalogue has been prepared, and will be distributed gratuitously to the members on payment of the subscription for next session.

"Arrangements have been made for renewing a portion of the museum. Applications made to some of the leading manufacturers of chemicals have met with a liberal response, and several new specimens will shortly be laid before you.

"It is a matter for congratulation that your thirteenth conversazione, held during the past session, proved so successful. Perhaps on no previous occasion have more of your members and friends assembled to participate in the enjoyment which these scientific entertainments afford. The principal exhibitors and demonstrators during the promenade were, Messrs. T. F. Abraham, J. Abraham, J. T. Armstrong, J. Andrew, G. F. Chantrell, E. Davies, J. H. Day, Charles Jones, A. H. Mason, J. T. Moore, A. H. Samuel, C. H. Stearn, and Dr. Symes. The following firms contributed objects of scientific and artistic interest for exhibition:—Messrs. Abraham and Co., Brown, Barnes, and Bell, Chadburn and Sons, Doulton and Co., Elkington and Co., Fearnall and Co., Symes and Co., etc.; and Mr. W. E. Bickerdike, F.C.S. (of Church), delivered an interesting popular lecture, illustrated by very successful experiments, on 'The Atmosphere.' Your Council desire to acknowledge their high appreciation of the gratuitous services of these gentlemen, and are the more encouraged for the future from the fact that the ultimate result proved the conversazione to be financially self-supporting.

"In compliance with an invitation, your Council appointed Messrs. Mason, Shaw, and Symes, as delegates to the British Pharmaceutical Conference, held at Plymouth.

"Your Council regret that the members have not more generally availed themselves of the opportunities for obtaining information which the Question Box affords; and they hope that this method of providing discussion will receive more support in the coming session; the admissibility of the queries being subject to the ruling of the President.

"The ballot for the appointment of President for next session resulted in the unanimous election of Mr. Thomas Fell Abraham, A.A.

"The following members of Council retire by rotation and are eligible for re-election:—Messrs. Abraham, Redford, Shaw, and Sumner.

"Your Treasurer will present a report of the finances of the Association, which shows a credit balance of £6."

The Hon. Treasurer, Mr. Robert Sumner, read the financial report, which showed that the expenditure during the year had been £47, and the receipts £49 16*s.* 5*d.* and that there was a balance in hand amounting to £6.

Mr. John Abraham moved:—"That the reports as read be adopted, and, together with the list of members and abstract of proceedings of the past session, be printed and circulated among the members." He said he could not let that opportunity pass without congratulating the retiring President, Mr. Mason (who, he regretted to say, was absent that evening through illness) upon the satisfactory state of the Association. Mr. Mason had presided over the Association for three consecutive sessions in a most creditable manner, and the success which had attended his skilful management of its affairs deserved the warmest thanks of the members.

Mr. A. E. Tanner seconded the motion, which was carried unanimously.

The meeting then proceeded to the election of four members of Council. Messrs. Abraham, Redford, Shaw, and Sumner were unanimously re-elected.

Dr. Charles Symes moved "That the best thanks of this meeting be given to the donors to the library and museum, and to the authors of papers during the past session."

Mr. Redford seconded the motion which was carried unanimously.

Mr. G. H. Damsell proposed "That the best thanks of this meeting be given to the officers and Council for their services during the past session."

Mr. Arthur Haddock seconded the resolution, which was carried unanimously.

Mr. Edward Davies, F.C.S., in highly eulogistic terms moved "That a special vote of thanks be conveyed the retiring President for his valuable services rendered to the Association during his three years of Presidency."

The Hon. Treasurer, Mr. Robert Summer, expressed the warmest satisfaction in seconding the motion, which was carried by acclamation.

A cordial vote of thanks to the Chairman brought the meeting to a close.

HULL CHEMISTS' ASSOCIATION.

The winter course of lectures on chemistry, in connection with the above Association, was inaugurated on Wednesday evening, September 26, at the Laboratory of the Lecturer, Mr. James Baynes, jun., F.C.S., Borough Analyst, in Scale Lane. More than the average number of students have entered, and it is hoped that the session will be a thorough success.

Mr. C. B. Bell, President of the Association, introduced Mr. J. F. Smith, the Vice-President, who delivered the following address:—

"Gentlemen,—In the address I have been requested to make, I wish to bring before you the necessity of determined and continuous study on the part of all connected with our trade, and especially of you students, who are, as it were, just commencing the race of life. It is only by such means that it is possible for us to keep fairly up with the time in the science of chemistry, of which you to-night begin a new course.

"I notice that three or four classes for the study of this science are placed before the general public by various educational bodies in the town, so you will see by this that we, as chemists and druggists, cannot afford to stand idle in such matters, for if we do, we shall, I am afraid, soon lose the confidence of our customers, or at any rate, of such of them as may have any knowledge of chemistry, and the number of these must become larger every year. I cannot conceive anything more calculated to make a chemist look foolish than having questions connected with his trade put to him by a customer, which he is unable to answer, besides the loss of self-respect such a thing must entail on himself. You may be sure that the customer thinks very much less of him than he did before. Such questions will naturally be more frequently asked of us as the science of chemistry is studied by the general public. There are, however, much higher and more exalted reasons why we should study thoroughly those branches of science which are inseparably connected with our trade; one, a desire that I hope is implanted in all of us, of improving and enlightening our own minds; another, and, in my opinion, a most important one to us, as chemists, is that, without such knowledge, we are totally unable to do our duty to our customers, especially to those presenting prescriptions for preparation, and also to the writers of the prescriptions.

"No doubt those of you who have been connected with the trade any time, have seen instances in which it would have been very dangerous for the patient to have taken medicines that might have been dispensed to them but for the chemical knowledge of the dispenser to whom it was presented; several such cases have come under my notice.

"As one of the examiners of this class for the past two years, I was glad to notice the very evident progress made during the last session. Mr. Stoakes, my co-examiner, and myself were greatly pleased with the quality of the papers, compared with those of the previous session, and I congratulate Mr. Baynes on the success which has attended his teaching. I must also express the hope that in the session now commencing you will take "Progress" for your motto, and reflect credit on yourselves and your teacher.

"The advantages afforded you in this course are very great, as in addition to the evening lecture, I understand that Mr. Baynes allows you the free use of his modern and most convenient laboratory, for which liberality he deserves the thanks of the committee and of yourselves; the fittest manner in which you can evince your gratitude for these advantages is by doing justice to your teacher, and taking care that each of you competes for the prizes offered at the end of the session, for although you cannot all obtain prizes you can each prove that you have thriven earnestly and done good honest work.

"Before I conclude allow me to say how very desirable it is that you should not sit down contented on succeeding in passing the Minor examination; it is as you all know the qualifying examination, and is without doubt an efficient test of a man's knowledge, but I would earnestly exhort you not to content yourselves with passing the qualifying examination, but by overcoming the higher voluntary examination place your names on the register of pharmaceutical chemists."

The President proposed a vote of thanks to Mr. Smith for his excellent address, which was seconded by Mr. Luslett (a student) and carried.

Mr. Baynes hoped that the students would be punctual in attendance, and it would be better to endeavour to be present ten minutes before the time than to come in a little after the lecture had commenced. He urged all to take notes during the lecture, and to read up the subjects at home. He also offered the use of his laboratory, as well as to assist those who would make use of it. He would give a prize to the student to attended most regularly, his position on the list at the examination being taken into consideration.

ABERDEEN SOCIETY OF CHEMISTS AND DRUGGISTS.

A meeting of the Society was held in the Rooms, St. Nicholas Lane, on Thursday the 4th inst., for the purpose of receiving the reports of the Library Committee and the Committee appointed to consider Mr. Paterson's motion on April 19th last. Mr. Cruickshank, President, in the chair. Minutes of former meeting were read and confirmed.

The Secretary then laid on the table the report of the Library Committee, stating that the Committee had sanctioned the purchase of a list of books to the extent of £5 sterling, the amount voted for that purpose at last meeting. The Committee also suggested that if members of the Society possess any suitable books, which they would be willing to present to the Library, the books would be very thankfully received by any member of the Committee. The report was adopted, and, on the motion of Mr. Paterson, a vote of thanks was passed to the Committee.

Mr. Paterson then laid on the table the following report of a Committee:—

"Your Committee have to report that they have taken steps to ascertain the feeling of the assistants and apprentices as to coming into closer relationship with this Society. It was explained to them that while the Society would retain the full power of the funds and transact its ordinary business as usual, yet, that any subscription received from them would be applied as far as practicable in increasing the library or in promoting lectures of interest to the trade. That in order to induce them to take an interest in the Society, a joint Committee, from the Society and the assistants and apprentices associating themselves, should be formed to arrange for lectures and any other object in which they are jointly interested. The Committee understand that at a pretty fairly attended meeting of the assistants and apprentices the proposal was warmly taken up. They would recommend that a body of associates be formed in connection with the Society, and that assistants contributing 5*s.* per annum, and apprentices 2*s.* 6*d.* per annum, be admitted associates thereof."

The matter was remitted back to the Committee, and in the meantime the Secretary was requested to send a copy of the report to the representative of the young men and inform him that the Committee would be most happy to meet with the assistants and apprentices on Thursday (Oct. 11), to discuss the matter and form a joint Committee to make further arrangements as contemplated in the report.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

On Tuesday, October 2, a lecture was delivered at the rooms of the above Association, Halford Street, by W. J. Harrison, Esq., F.G.S. Subject, "Fermentation." Mr. W. B. Clark occupied the chair.

After a few introductory remarks by the chairman, Mr. Harrison proceeded to notice the amount of knowledge possessed by the ancients with regard to alcoholic fermentation; also the process of brewing in this country and upon the continent. Yeast and other ferments were then described. The lecturer also referred to the germ theory and the use of carbolic spray by surgeons during surgical operations.

The lecture was listened to with great interest and pleasure, and at the close a vote of thanks to the lecturer was carried unanimously.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

(*Concluded from page* 255.)

The last paper read was on—

Effects of Variations of Temperature on Boiled Putrescible Liquids.

BY W. WILLMOTT.

The experiment which has been devised to solve the question of the possibility or otherwise of life being evolved from dead matter, is of a very comprehensive character. The question itself is of the deepest interest, not only to the scientific physician, but to the chemist, the physicist, and, perhaps, above all, the biologist. As a matter of speculative thought, it dates far back into the past, and as one of scientific investigation it has received the attention during many generations of "an almost unbroken succession of inquirers." Two hypotheses are held respecting it: "One, the germ theory, which declares that no life has ever been evolved (except in the remotest periods of the earth's history) otherwise than from a living parent or a living germ; the other, the spontaneous generation theory, which declares that now, as of old, life does also spring *de novo* from molecular rearrangements of the atoms of dead organic materials."

To test the truth of one or other of these hypotheses, we are told "there is absolutely nothing to be done but to take dead matter, isolate it from all contact with life, place it under favourable conditions for development, and watch the result;" and yet it is said, "this task has seemed to defy the efforts of as keen a body of inquirers as ever attacked any problem of nature."*

The method of experimentation almost uniformly adopted involves the employment of certain putrescible infusions or other liquids in which bacterial life in its many forms is well known to appear in conjunction with any fermentation or putrefactive change which such liquids may be allowed to undergo. The behaviour of

* *Vide* very able article by "Inquirer," in the April number of the *Contemporary Review*.

the freshly prepared fluid after it has been submitted to a boiling heat and protected, by one of many well devised methods, from fresh sources of life in the surrounding atmosphere, is carefully noted. If bacteria* make their appearance it is conjectured that they must have arisen *de novo* from the supposed dead organic material of the infusion. The question is simple in statement, but, nevertheless, is beset with difficulties, which are not unfrequently of an embarrassing character. Of the many eminent experimenters who have recently devoted their earnest attention to the subject, "by far the most conspicuous" is Professor Tyndall. He has gone over the ground so much in detail, and subpœnaed so curious a "cloud of witnesses," that some danger has been incurred of the investigation passing from the sublime to the ridiculous. In his laudable desire to grasp the whole truth he has multiplied and repeated his experiments, with a great variety of putrescible substances, almost *ad infinitum.* Thus we find amongst the number operated upon, infusions of "mutton, beef, pork, hay, turnip, sole, haddock, codfish, salmon, turbot, mullet, herring, eel, oyster, whiting, liver, kidney, hare, rabbit, barn-door fowl, pheasant, and grouse." And all this to show that putrescible fluids, when once sterilized and properly protected from the floating dust *(i.e.,* the germs) contained in the air, are incapable of spontaneously generating life in any form.

But Professor Tyndall's results are by no means unreservedly accepted, and the objection is entertained that he denies the conclusions of other investigators "mainly on the strength of his own unconfirmed experiments." It was this consideration which, in part, induced me to branch off from the inquiry I was, some time since, pursuing, to supply, so far as the means at my command would permit, a corroboration or the reverse of the Professor's ably achieved results. The introduction of an entirely different method of procedure might, as I thought, possess some value, whilst the experiments, if reduced to the utmost possible simplicity, would probably not be without their due weight in the balance. The *Pharmaceutical Journal* (Feb. 19, 1876) significantly refers to *temperature* as being an important consideration in this inquiry.† That it is so in the highest degree there cannot be a doubt, and indeed without a due regard to this point experiments are of little value as indicating perfectly reliable results. The three temperatures, or ranges of temperature, which I have chiefly employed for working out my conclusions are the following:—130° to 160°, 90° to 110°, and 60° to 80°, all on the scale of Fahrenheit. At each of these ranges a different result is often obtained with the same infusion, and it is desirable, therefore, to connect them all closely with the inquiry.

With regard to the microscope, where such aid has been thought necessary, I have been fortunate enough to receive the assistance of a gentleman who for many years past has made microscopy his special study; and I am much indebted to him for the great service he has rendered me. The microscope, in this inquiry, is an all-important auxiliary, though in the majority of instances the unassisted eye will suffice to determine the question of life or no life.

We have spoken of numerous well devised methods for the purpose of protecting or isolating the prepared fluid after it has been boiled a sufficient length of time. It matters little which of these methods is selected, provided the operation is adroitly performed, for when the fluid is completely sterilized they will all be found sufficiently perfect to keep it so. It is quite probable, if indeed there is any difference at all in their value, that, by a sort of paradox, the worst may be the best, since, if the fluid is *not* sterilized, its condition of vitality will be thereby the more readily manifested. This, then, is one of the chief points to be determined. Is the liquid, after experiment, completely sterilized or only partially so? Much misconception has, I think, arisen from an insufficient consideration of this particular feature in the inquiry.

After a number of experiments with cotton wool, an old but efficient medium in completely arresting germs and ultra-microscopic particles, I found that in the apartment in which I was working, my specimens were by this process completely preserved; but on submitting others similarly prepared to a high incubating temperature, viz., 90° to 110° F., they broke down without exception in a very decided manner. I may state here that, at this temperature, protected infusions which are not sterilized usually begin to change within twelve hours, and whenever they are found intact at the close of the third day, almost invariably remain so for an indefinite period of time. Many of my specimens protected with wool, have evaporated to an extract without the slightest putrescent change.

On seeing the effect of the higher temperature on the prepared infusions I was in doubt as to the power of the cotton wool sufficiently to filter the air; but on substituting pear-shaped flasks for the form of vessel I was using, the effect was entirely reversed. All the infusions remained sound, and there was not a single delinquent amongst them. From pear-shaped flasks I soon passed to conveniently shaped bottles; for I had no intention of departing from the plan, which I had from the first adopted, of boiling the liquids in an open vessel of a suitable construction. Later on, I employed tinfoil almost entirely in the place of cotton wool, finding its preparation for the purpose intended far more rapid and convenient.* Thus my process was extremely simple, and I think wholly to be depended upon when carefully performed.

I had experimented in this way on hay, gentian, calumba, and also turnip. The next substance to be dealt with was cucumber. This was one of the most refractory of all Professor Tyndall's "witnesses," because of its great proneness to decomposition. I took, therefore, unusual care in preparing the specimens, using glass stoppers and cotton wool as protecting media, the former having been specially made for me with tapering points, so as to admit of their introduction into the neck of the bottle without even the smallest modicum of air.† Though one minute only was allowed as the time of boiling, the specimens remained perfectly pellucid, and without the slightest indication of change. It is fair to say that magnesium carbonate, and not potash, was here used as the neutralizing agent; and this I subsequently found to be a method of treatment to which cucumber is in a very marked degree amenable.

From this point I passed on to *old* hay and soon encountered my first real difficulty. There could be no

* "Bacteria" is a very convenient term, including numberless forms of animalcules belonging to the "Infusoria."

† "The range of temperature in Professor Tyndall's experiments was less than that directed by Dr. Bastian in the 'Beginnings of Life.' Whatever may be the actual value of this difference it is unfortunate that it should have existed."

* To make this material secure, as it is apt to be perforated with minute pin holes, a sheet of tinfoil is brushed over with a thin coating of mastic varnish. On this is laid a covering of waxed paper, and another sheet of varnished foil being then placed smoothly on the paper, the whole is introduced into a powerful press, and by this means firmly united together. The sheets thus prepared are as impervious to the atmosphere as glass itself. The precaution is not really necessary if the foil be used doubled, but its adoption will serve to dispel all doubt. Though this process does not admit of a complete vacuum between the surface of the liquid and the tinfoil, the air is quite sufficiently excluded to render it in this respect entirely free from objection. The danger resides more in the liquid itself than in the air above it.

† It is well known that at ordinary temperatures boiled infusions may be perfectly preserved by means of glass stoppers.

possible mistake about *the age* of the sample (1874) I was fortunate enough to secure. It will be remembered that it was *old* hay which caused such an infinity of trouble at the Royal Institution, and so infected the atmosphere with its germs that it was only by "the gradual but irresistible interaction of thought and experiment" that the true cause of the many failures experienced was at length brought to light. In dealing with this substance, therefore, I was specially careful to avoid accidental error in isolating the specimens. Several of these, prepared with slight differences, were placed in the usual temperature, and all broke down within twenty-four hours. The same thing was repeated with additional precautions and again every specimen broke down. I now became very much interested in the old hay, and my next plan of procedure was to submit it to the vapour of a powerful germicide for twenty-four hours; but this proved of no avail, the infusions broke down as badly as before. I then tried careful filtration through various media. This effected some good but was not entirely successful. The hay was next subjected, in its dry condition, to a high temperature for several days. There was evidently an improvement after this, though bacteria still continued to put in an appearance. What, then, was to be done? Long periods of boiling were not to be thought of, but if an agent could be found which would suspend putrefaction in the liquid and yet entirely pass off without causing any change, the germs might, in due time, become "softened," and the five minutes' boiling accomplish the rest. Such an agent was to be found in chloroform. Chloroform is one of the most perfect antiseptics we possess, but it does not kill the germs or destroy the putrescent tendency of the infusion. Accordingly, a suitable quantity of the latter containing two minims of chloroform to each fl. oz. was prepared and placed in the incubating temperature for a week. It was, of course, at the end of that time, in perfect condition; a small portion protected with wool gave way as soon as the chloroform had passed out of the fluid, showing that the infusion was not changed in any way. Protected specimens of this preparation were tried as before but altogether without success. The theory of *softening*, even in a warm temperature, received no illustration or countenance from this experiment, so that the question forces itself upon the mind, is it a particulate germ at all which causes putrefaction? If so, it must be of remarkable tenacity since it may be asphyxiated indefinitely by the chloroform without being softened in the slightest degree by the heated fluid.

How, then, was the old hay conquered? The infusion was boiled for one minute and placed in a *continuous* temperature ranging from 130° to 160° Fahr. At the end of a week it was removed and the whole thing was accomplished. As the organisms became developed, or, in fact, before this occurred, they were summarily disposed of by the heat, the infusion being thereby left in a permanently pellucid condition.

But after this success, I found on further trial with other substances, that my previous results were not again obtainable. This was precisely an analogous case to that of the Royal Institution. I commenced, therefore, a systematic attempt better to understand the conditions which governed these erratic changes. A great deal had been said about *potash*. What was the real part played by this substance in the production of the observed results? The experiments as shown in the following table gave me the answer:—

Infusion.	Time of Boiling.	Quantity of Liq. Pot. to ℥j.	Reaction.	Temp.	Result.
Cucumber.	1 min.	None.	Acid.	95° to 110° F.	Broke down within 48 hours.
„	„	♏ j	Neutral.	„	Do. do.
„	„	„ ij	Alkaline.	„	Do. do.
„	„	„ iij	„	„	Do. within 3 days.
„	„	„ v	„	„	Intact.
„	„	„ x	„	„	Do.
„	5 min.	None.	Acid.	„	Broke down within 48 hours.
„	„	♏ j	Neutral.	„	Do. do.
„	„	„ ij	Alkaline.	„	Do. do.
„	„	„ iij	„	„	Do. within 3 days.
„	„	„ v	„	„	Intact.
„	„	„ x	„	„	Do.
„	10 min.	None.	Acid.	„	Broke down within 3 days.
„	„	♏ j	Neutral.	„	Do. do.
„	„	„ ij	Alkaline.	„	Intact.*
„	„	„ iij	„	„	Broke down within 3 days.
„	„	„ v	„	„	Intact.
„	„	„ x	„	„	Do.
„	15 min.	None.	Acid.	„	Broke down within 3 days.
„	„	♏ j	Neutral.	„	Do. do.
„	„	„ ij	Alkaline.	„	Do. do.
„	„	„ iij	„	„	Do. do.
„	„	„ v	„	„	Intact.
„	„	„ x	„	„	Do.
„	½ hour.	None.	Acid.	„	Broke down within 3 days.
„	„	♏ j	Neutral.	„	Intact.
„	„	„ ij	Alkaline.	„	Do.
„	„	„ iij	„	„	Do.
„	1 hour.	None.	Acid.	„	Intact.
„	„	♏ j	Neutral.	„	Do.
„	„	„ ij	Alkaline.	„	Do.
„	„	„ iij	„	„	Do.

* Contradictory Result.

Here, then, seems to be revealed the whole secret of the potash. If the fluid is completely sterilized, it is perfectly immaterial how much or how little potash is added. On the other hand, if the potash is added in sufficient quantity to prevent the fluid from becoming acid, it is of no consequence whether it is sterilized or not. The action is perfectly consistent throughout. The potash simply plays the part of an efficient antiseptic. Like all substances of this class, the effect it produces bears an exact relation to the quantity used.

The following table shows the wide difference in effect between a temperature of 70° F. and 100° F., in relation to bacterial development:—

No. 1. TEMPERATURE, 70° Fahr.

Infusion.	Time of Boiling.	Result.
Turnip.	1 minute.	Slightly cloudy.
,,	2 ,,	Clear & pellucid after a month.
,,	3 ,,	Do. do.
,,	4 ,,	Do. do.
,,	5 ,,	Do. do.

No. 2. TEMPERATURE, 100° Fahr.

Infusion.	Time of Boiling.	Result.
Turnip.	1 minute.	Broke down within 48 hours.
,,	2 ,,	Do. do.
,,	3 ,,	Do. do.
,,	4 ,,	Do. do.
,,	5 ,,	Do. do.
,,	6 ,,	Do. do.
,,	7 ,,	Do. do.
,,	8 ,,	Do. do.
,,	9 ,,	Do. do.
,,	10 ,,	Remained Intact.

The above seems to show that error may be caused by concluding that an infusion is sterilized because it remains pure at certain temperatures. Unless protected infusions are submitted to a temperature of 100° to 110° F., they can scarcely be said to have undergone the severest test of their assumed sterilized condition.

We now return for a moment to the old hay. In order definitely to test the question of infection of the air by hay particles or germs, Professor Tyndall had a shed erected on the roof of the Royal Institution. In this shed infusions were prepared precisely as before, but the experiment, we are told, resulted in complete failure.* The shed was then disinfected, the infusions were again prepared, suitable clothes were worn, and "the result was similar to that obtained at Kew, viz., organic liquids which in the laboratory withstood two hundred minutes' boiling were rendered permanently barren by five minutes' boiling in the shed." A rod thirty feet in length would stretch from the infusions in the shed to similar infusions in the laboratory. "Either," says the Professor, "we infer that at one end of the rod animal and vegetable infusions possess a generative power which at the other end they do not possess; or we are driven to the conclusion that at the one end of the rod we have infected and at the other end disinfected air." I cannot say that I am prepared to accept unreservedly either of these inferences. The professor had at one end of the rod a powerful weapon which he did not possess at the other, namely, carbolic acid. Carbolic acid is not only a disinfectant, it is a powerful antiseptic. Organic liquids placed sufficiently long in the vapour of this antiseptic would absorb it and thus become preserved. To test this I made a somewhat similar experiment. The floor and walls of a small room a few yards distant from the laboratory were well washed with a 2 per cent. solution of carbolic acid, the odour of which was perceptible in the air of the room for several days. In a small box or chamber, protected by cotton wool, were placed tubes of cucumber and turnip infusion, the whole being left in the room charged with the carbolic vapour. In six days the tubes were removed from the box, and it was quite evident from their sound condition, as well as from their subsequent behaviour, that sufficient acid had been absorbed to render it highly probable that, under favourable circumstances, a condition of permanent stability would be thereby imparted to them. I do not offer the foregoing as an explanation of the wide difference experienced at the two ends of the hypothetical rod, but simply as a third inference arising out of the circumstances of this particular experiment. Whether in my own case, the hay dust was capable of infecting the air and contaminating the infusions I was preparing, it was my special care to determine by actual experiment. Taking, on several occasions, cucumber and turnip infusions of a strength known to be sterilized by five minutes' boiling, I placed them in wide open vessels in a confined space in which old hay had previously been shaken. After twelve hours they were boiled and protected in the usual way and almost uniformly foreign organisms were developed. I now applied the same process to a fair sized room. Hay was tossed and shaken in this room until there was a perfect haze of dust. The next day nothing could be seen of this dust in the air, but it had not all fallen. Infusions were prepared in the room and clearly developed the organisms, though not so extensively as in the former experiment; indeed, one specimen which was not submitted to the high temperature remained free from all signs of life. Where this infection ends it is not easy to say, but I am disposed to think it does not extend very far. Infusions prepared in the same room a day or two later became very slightly cloudy, but otherwise remained intact, though the same dusty garment was worn by the operator. Nor does this hay infection appear to resist determined treatment. Twenty minutes' boiling, or very careful filtration specially conducted, will destroy or remove the "plague" if it has not removed itself by falling to the ground. This I give as my experience.

* See *Nature*, June 14th 1877, p. 127.

There can be no doubt that many circumstances combine to influence the erratic and often unaccountable behaviour of these vegetable organic fluids. Among them may be enumerated the following:—(1) Condition and age of the substance employed; (2) strength of infusion; (3) method of filtration; (4) insolation, or exposure to the sun's rays; (5) chemical constitution; (6) time and manner of boiling; (7) temperature previous to protection; (8) temperature after protection; (9) method of isolation; and (10) completeness in the performance of the process involved. We have already referred to the *strength* of infusions as influencing their sterilization, and amongst the causes enumerated above this is a very prominent factor. Five minutes' boiling will usually be found sufficient if the strength is regulated accordingly. I give the following as proportions from which, *cœteris paribus*, something approaching uniform results may be looked for:—

Infusion.	Strength Employed	Time of Boiling.	Temperature.	Result.
Cucumber	ʒij in ℥j	5 minutes	90° to 110° F.	Breaks down.
,,	ʒj ,, ℥j	,,	,,	Remains intact.
,,	ʒss ,, ℥j	,,	,,	,,
Turnip	℥j ,, ℥j	,,	,,	,,
,,	℥ss ,, ℥j	,,	,,	,,
,,	ʒij ,, ℥j	,,	,,	,,
Old Hay	1 oz.,, Oj	,,	,,	Breaks down.
,,	½ oz.,, Oj	,,	,,	Remains intact.
,,	¼ oz.,, Oj	,,	,,	,,

If, on the other hand, we take strong or refractory infusions, and direct our attention to the time of boiling required to sterilize them, we may regard the following as starting points from which we may branch off into more exact experiment:

Infusion.	Relative proportions as protected.	Temperature.	Time of boiling required for sterilization.
Cucumber.	1 oz. to 1 floz.	95° to 110° F.	Within ½ hour.
Turnip.	1 oz. ,, 1 floz.	,,	,, 10 minutes.
Old Hay.	4 oz. ,, Oj	,,	,, ½ hour.
Cucumber charged with old Hay dust.	½ dr. ,, 1 floz.	,,	,, 20 minutes.

We may observe that particularly strong infusions are sometimes sterilized with greater facility and in less time than those prepared in a weaker form. A good example of this is turnip, which when prepared in the above proportions may usually be sterilized without difficulty by five minutes' boiling; and this, moreover, even if prepared in an atmosphere charged with hay dust, provided the filtration be conducted away from the compartment so infected. The reason is that the particulate matter is very perfectly retained by the pulp, leaving a brilliantly clear liquid, which is specially free from motes and ferments of a solid character.* Thus we may, by repeated and continuous experiment, reduce all this apparent contradiction to something like law and order. At present, the operator is puzzled beyond measure by the erratic behaviour of his prepared fluids under varying circumstances of a scarcely appreciable character, from causes which he can neither see nor grasp. But one thing seems clear. A putrescible infusion in which the ferment has once been destroyed by heat, is deprived of the ability to undergo in itself those chemical changes with which low forms of life are so abundantly associated.

Before leaving the class of experiments which has received such marked attention from Professor Tyndall, we note that, referring to the germs of old hay, he remarks with very laudable concern, "It is a question of obvious interest to the scientific surgeon whether those powerfully resistant germs are amenable to the ordinary processes of disinfection. How would they behave in the wards of a hospital?" This, I think, is not a difficult question to answer. They would behave very much as they behaved in the Professor's own shed, that is, they would be rendered harmless by the disinfectant if it happened to be present in any appreciable quantity. To illustrate this, the following experiment was made:—Old hay was cut very fine and introduced into two separate wide-mouthed bottles. The bottles were then shaken so that the dust from the hay, in quite a cloud, might completely fill them. Infusions boiled one minute only were introduced into the midst of the dust in open vessels resting on the solid hay. In each bottle was placed a small quantity of cotton wool moistened in one case with carbolic, and in the other with sulphurous acid, so that the vapour might distribute itself through the fine particles of dust which were of course fast falling into the infusions. Let us suppose the bottle to be the ward, the infusion the susceptible patient, and the dust-laden air the medium through which the disinfectant was distributing itself and exerting its influence. Now, did the infusions change and putrefy or did they not? They did not, and they remain in each case clear and translucent to the present day; not because the desiccated germs were destroyed by the disinfectant, but because the penetrating vapours were absorbed by the liquids and exerted their antiseptic properties. Disinfectants are not all antiseptics, and *vice versâ*, but here they combine the two effects. The favourable conditions, however, of this experiment could not be secured in a hospital ward, since they would be interfered with by the currents of air passing through the ward from the open doors and windows; but the good to be derived from carbolic acid *dressings* is already achieved to the fullest extent.

Speaking purely from a chemical point of view, it is a question for the scientific surgeon whether obstinate and fœtid wounds would not heal rapidly in a high and antiseptic temperature, such as 130° F., where no putrefactive change ordinarily so called can go on, provided always it be possible to subject the patient, or the wound itself, to its continuous influence. The clear, smooth, and healthy surfaces of men who are constantly in the "calidarium" seem to point to good, rather than harm, from such an ordeal; and we all know the extraordinary adaptability of the human system to changes of a severe character when gradually introduced.

We now pass to "turnip and cheese." Turnip and cheese! That it should be necessary to introduce such substances into a scientific discussion! "Oh, the pity of it, Iago, the pity of it!" But thus it is, for we have here a highly nitrogenous compound exceedingly prone to decomposition. Of turnip and cheese it is said, "it is established beyond dispute that a turnip infusion with cheese dust added, will produce life after having been boiled and protected from contact with the atmosphere or anything it may contain." This is perfectly true, but as we have seen that all these things are apt to differ in their power of resisting a boiling temperature the value of the statement from its indefiniteness on this point is clearly detracted from. "After having been boiled." True, but how long boiled? This is important because amongst the compounds which seem to favour the theory of spontaneous generation, this one of turnip and cheese holds a very prominent place. Cheese *dust* is the substance mentioned, but whilst the dry powder was managed without any great difficulty, moist cheese was found to be very intractable. The latter was mixed in the proportion of 10 grs. to each fl. oz. of turnip infusion. The mixture was boiled five minutes and then carefully filtered. The filtrate was opalescent and charged with casein. When this was boiled and placed as usual in the incubating temperature it could not be preserved, but, on the addition of liq. potassæ, q. s., to prevent the separation of the casein, or to hold it in solution, there was no apparent change. Here, again, we have the potash showing itself antagonistic to germ life and development. Ultimately this obstinate mixture of turnip and cheese was successfully dealt with, as in the case of the old hay, by placing it in the extreme high temperature (130° to 160° F.) for six days. When removed it was found free from change, having acquired a condition of permanent barrenness.

We have, lastly, to deal with a fluid which has very recently been the subject of dispute between Dr. Bastian and M. Pasteur. The fluid in question, viz., urine, is a highly complex chemical compound and, therefore, imparts to the inquiry a purely physico-chemical character. The difference betwen the two philosophers named, has reference to the production of life in this fluid after it has been boiled and neutralized with potash. The former asserts that under such circumstances "swarms of bacteria" are invariably generated in it, whilst the latter, M. Pasteur, emphatically denies this, conditionally upon the potash having been previously heated for a few minutes to 110° C. to destroy the germs which he states are introduced with it. The arrangement for the experiment has been very ingeniously devised. The potash is heated to the required degree in a small sealed tube which is then introduced into the flask containing the fluid to be boiled. After the boiling (the time unfortunately is not specified) and sealing of the flask hermetically, the tube is broken and its contents mingling with the acid fluid, renders it about neutral, in which condition it has been found by one experimenter very fruitful, and by the other altogether barren. The difference is made to turn upon the potash, as to whether it has been heated sufficiently to destroy the supposed germs which it is said to contain. But I hold from what I have observed in reproducing this experiment that the potash plays a negative part only. The fluid is kept from undergoing decomposition by the free acid it contains. When this is removed by the potash, always in certain relative proportions to it, its antiseptic effect is removed also, and the fluid is free to undergo the putrefactive change, either if it is capable of generating life anew, or if the germs which it previously contained have not been destroyed by the boiling process. This view of the case is borne out by the fact that too much,

* The effect of filtration through various media on putrescible fluids is a subject for further experiment. Would porous porcelain arrest and retain *all* particulate matter in a translucent and freshly prepared organic liquid, and would the ferment whether particulate or not be capable of being so retained?

or too little potash will interfere with the result and prove fatal to the production of life. In the former case the potash itself will be the antiseptic, and in the latter, the acid will still be present in sufficient quantity to retain its effect. Here, again, we see that the question becomes one of *quantity*, supposing either of the above conditions (spontaneity of generation, or non-destruction of germs) to be present in the liquid. But now let us ask a question upon which we have already laid great stress, viz., when the potash is added to the cooled fluid, is the latter sterilised or is it not? The fact that the fluid remains barren before the addition of the potash, even if the latter be delayed for weeks, is no proof whatever of its being in a sterilized condition, since the free acid is there to preserve it from change and prevent it from becoming fertile. That it is of a very refractory character and very resistant to heat seems from experiment abundantly clear. When exactly neutralized with liq. potassæ and boiled for five minutes, the alkali, to a greater or less extent, is dissipated, and the acid reaction becomes re-established. The fluid is also turbid from the deposition of earthy phosphates. Therefore, to secure a bright and neutral liquid we proceed as follows. Three separate boilings are often sufficient, but we give an instance of five:—

1.	Filter and Neutralize with m xj L. Pot. to ℥j.	Boil 5 minutes.	Result. Turbid. Acid to Test Paper.
2.	Re-filter and Neutralize with m v L. Pot. to ℥j.	Boil 5 minutes.	Result. Turbid. Acid to Test Paper.
3.	Re-filter and Neutralize with m iv L. Pot. to ℥j.	Boil 5 minutes.	Result. Turbid. Acid to Test Paper.
4.	Re-filter and Neutralize with m iiiss. L. Pot. to ℥j.	Boil 5 minutes.	Result. Bright. Very slightly acid to Test Paper.
5.	Neutralize with m j, L. Pot. to ℥j.	Boil and Protect.	Result. Negative at 120° and upwards, and at 60° to 80°; but positive at 90° to 110°.

The result here shown is exceedingly instructive. Life is manifested at the medium temperature, but fails to appear at 70° and 120°, thus illustrating in a marked manner the importance of a few degrees of heat more or less in influencing the result. At 120°F. and above, all my results were negative. The changes were purely of a chemical character. Earthy phosphates and triple crystalline deposits were thrown down in the presence of the potash by the action of the heat, as in the case of boiling, all being freely soluble in nitric and hydrochloric acids. At the same time ammonia was rapidly generated from the breaking up of the urea. The formation of ammonia is usually associated with putridity. Putridity, in a sense not generally so understood, may here be present, but it is unaccompanied by vibriones, or bacterial life of any kind. This phenomenon has not, that I am aware of, been noticed by any writer on the subject. To show the resistant power to sterilization of this organic fluid, it may be stated that a specimen boiled for twenty minutes and neutralized, as already shown, was submitted to 150°F. for about 72 hours, then again boiled and protected and placed in the incubating temperature. Yet, notwithstanding this, it gave distinct evidence of life within the usual three days. It is clear, therefore, that to render urine completely barren it requires very prolonged and active treatment. Nor must it be forgotten that it is only when the potash is added in certain definite proportions that bacteria make their appearance. The reason of this, as before intimated, is sufficiently obvious. The free acid and the alkali are both antiseptics. Should either predominate over the other in sufficient quantity to exercise its antiseptic action, the result will be negative. On the other hand, if this action has been nullified in each instance by proper proportionate quantities the reverse will be the case, *i.e., if the fluid remains in an unsterilized condition.* It will be seen that in carrying out this experiment, except by the thoroughly experienced expert, at least six flasks should be taken containing the potash in different proportions to the ounce, from five minims up to fifteen. The correct quantity will then be secured, for normal urine differs very widely in the amount of acid it contains. Exact neutralization, or a little below it, is the condition to be aimed at. Under such circumstances we get results similar to the following:—

Boiled 5 minutes.		
Liq. Potass to each ℥j	Temperature.	Result.
v m.	100° to 115°F.	— *
vij „	„	— *
ix „	„	+ ϕ
xj „	„	+ ϕ
xiij „	„	+ ϕ
xv „	„	— *

Boiled 1 Hour.		
Liq. Potass to each ℥j	Temperature.	Result.
ix m.	100° to 115°F.	— *
x „	„	— *
xj „	„	+ ϕ
xij „	„	+ ϕ
xiij „	„	— *
xiv. „	„	+ ϕ

* — Negative, indicating no change.
ϕ + Positive, showing development of life.

It will be observed, that in each of the above experiments (boiling respectively for five minutes and one hour) three flasks broke down, whilst three remained intact. This singular outcome was no doubt entirely due to the relations between the acid and the alkali present in the unsterilized fluid. How long it would be necessary to continue the boiling to secure entire immunity from these "break downs," if such a result is to be accomplished at all, I am not prepared to say; but if life can be detected after eight hours' boiling in the case of old hay infusion, we may, perhaps, fare but little better in the present instance. Nor is it all necessary to determine this, for we fall back upon our infallible treatment, and all ambiguity disappears. The result is slowly and unobtrusively, but yet decisively, worked out for us. Six days quietly devoted to the destruction of the germs at the bacterial death point, will set the question completely at rest. We shall have our earthy phosphates deposited by the action of the heat; but no matter. Physics and chemistry may step in to alter and rearrange, but the question is,—Can life be generated *de novo* in any fluid which is, in reality, the dead organic matter we are necessarily required to secure? And this can only be answered by having the absolute assurance that it *is* this *dead matter* from and out of which the new life comes actively into being.

The outcome of all this will no doubt have been anticipated. I propose, in fact, to do away with boiling as a means of sterilization, and substitute continuous heating at a lower point on the scale. We shall thus do away with all complication and liability to "grave error," and reduce the test to one of extreme simplicity. For the moment, we lay aside flasks, boxes, chambers, retorts, bulbs, tubes, *et hoc genus omne*, and call to our aid accurately fitted stoppered bottles. Robbins' 4 oz. anhydrous ethers answer admirably. The prepared fluid is boiled for one or more minutes where the decomposition is usually found to be rapid, and then introduced into the phial to about two-thirds of its capacity. The air space is left, to allow of subsequent expansion in the case of unboiled liquids. Having introduced the stopper and secured it firmly in its place, the phial is labelled and placed immediately with its contents in an atmosphere heated to 150° Fahr., or above. There it is left, the heat being continuously maintained. The exact time which should intervene in each case to secure subsequent immunity from change must be determined by experiment. To make assurance doubly sure I have usually allowed six days for the operation, and not in any single instance, after the lapse of that time, have I observed the slightest indication of bacterial development. Thus, I have infusions of gentian and calumba, old hay, new hay, turnip, cucumber, beef, turnip with cheese, and the test-fluid referred to, with and without potash, all perfectly sound and translucent, and apparently in a condition of permanent barrenness. If we have any affection for hermetically sealed flasks and glass bulbs, we may prepare these in the usual way and substitute the comparatively low but continuous temperature for our lamps and oil-baths. The experiment is entirely novel and something more. It is, so far as I have carried it out, *conclusive* as to the point at issue. With great earnestness and ability Dr. Bastian has made clear to us the degree of heat in which all bacterial life is extinguished.* It follows, as an irresistible conclusion, that if this heat be sufficiently prolonged, the most indurated and resistant germ will ultimately succumb and cease to be. If, at this point, life cannot be reinstated without contact with fresh sources of vitality, we may, perhaps, be permitted to say of spontaneous generation, as Macbeth said of his immortal dagger, "There's no such thing!" My experiments irresistibly tend in this direction, and as they are extremely simple they may be gone over and verified by all who have the requisite technical knowledge for conducting the processes involved. The result will probably be shadowed forth to them in the old Latin proverb, *E nihilo nil fit.*

In conclusion, it will be readily understood that in this investigation there is a great deal behind the scenes, both of failure and success, of hard, profitless, and yet encouraging work, which must necessarily remain unrecorded. But most assuredly in this, as in all physical and chemical research, the results will be accurate and reliable in proportion as the means selected for their achievement are zealously worked out, and adequately and impartially fulfilled.

The PRESIDENT thought Mr. Willmott had thrown some new light on the subject, indicating that time was an element in the application of heat to destroy the vitality of low forms of life.

Mr. KINGZETT, having followed the discussion on this subject fairly well, could see nothing new in the paper which had been read. The dead lock in the controversy depended on what had been discovered by Mr. Dallinger, namely that although the heat employed by Dr. Bastian or Professor Tyndall might be sufficient to kill germs, it was totally insufficient to kill spores. He did not see how Mr. Willmott's method would affect this question.

Mr. WILLMOTT said he had the pleasure of hearing the lecture given at the Royal Institution by the Rev. Mr. Dallinger, who stated that he found germs or spores of bacteria were killed only at a temperature of 300° by dry heat, and also gave a description of the mode in which he experimented. His (Mr. Willmott's) method was totally different. The germs or spores, for he did not refer to developed bacteria, were not submitted to dry heat but to moist heat, and Dr. Bastian had correctly pointed out that the temperature necessary to destroy the germs or spores of bacteria in a *moist* heat was 158°. The method of keeping up the heat to this point for a length of time, not boiling at all, except (in some instances) for one or two seconds, was perfectly new.

The PRESIDENT in moving a vote of thanks to Mr. Willmott said this concluded the list of papers.

Professor ATTFIELD read a list of names of gentlemen desiring to become members, who were elected unanimously.

PLACE OF MEETING IN 1878.

Professor ATTFIELD then moved that the Conference meet next year in Dublin on the days immediately preceding the meeting of the British Association. He said he had had a communication from the Secretary of the Pharmaceutical Society of Ireland, enclosing a resolution to the effect that the Council of the Society desired that the Conference should meet in Dublin next year. He had also had many letters from leading pharmacists in Ireland expressive of the same desire. And he thought that the representative members of the Conference were in favour of meeting in Dublin in 1878.

Mr. WILLIAMS seconded the motion. He did so with all the more pleasure because when the British Association met in Belfast there were reasons which prevented the members of the Conference visiting their friends in Ireland, but things were altered now, and he had no doubt they would have a pleasant and profitable meeting.

Mr. PAYNE (Belfast) was very sorry to find he was the only member of the Conference present from Ireland, but he thought probably the days on which the meetings were held had something to do with it, being rather inconvenient for the Steam Packet Service. Professor Tichborne had been thus prevented arriving in time to give a formal invitation from Dublin; but he could assure the Conference that the Irish pharmacists would do all they could to give their English friends a hearty welcome.

The resolution was carried unanimously.

The following officers were then elected for the ensuing year:—

President.

G. F. SCHACHT, F.C.S., Clifton.

Vice-Presidents.

Professor TICHBORNE, F.C.S., Dublin.
R. REYNOLDS, F.C.S., Leeds,
R. W. PRING, L.A.H.D., Belfast.
J. WILLIAMS, F.C.S., London.

Treasurer.

C. EKIN, F.C.S., Bath.

General Secretaries.

Professor ATTFIELD, F.C.S., London.
F. BADEN BENGER, F.C.S., Manchester.

Local Secretary.

W. HAYES, Dublin.

Other Members of Executive Committee.

M. CARTEIGHE, F.C.S., London.
A. P. BALKWILL, Plymouth.
H. N. DRAPER, F.C.S., Dublin.
B. S. PROCTOR, Newcastle-on-Tyne.
E. SMITH, F.C.S., Torquay.
W. A. TILDEN, D.Sc., F.C.S., Clifton,
C. UMNEY, F.C.S., London.
J. T. HOLMES, Dublin.
J. C. THRESH, F.C.S., Buxton.

Auditors.

S. B. TURNEY, Plymouth.
W. ALLEN, Dublin.

Mr. SCHACHT said he very much appreciated the honour done him in electing him President. It would be affectation not to say that he had looked forward to the possibility of some day occupying this distinguished position, and at a distance the fact did not look very alarming; but when it came closer the difficulties appeared in a

* 158° Fahr. Bastian. Moist heat.
300° Fahr. Dallinger. Dry heat.

stronger light, especially as he had to follow Dr. Redwood's very able presidency. However, he could only throw himself on the indulgence of the gentlemen who attended the Conference with a promise to do his best.

Mr. SCHACHT again rose to propose a vote of thanks to the Local Committee who had exerted themselves so much to make the meetings pass off well, and were on the morrow intending to do still more in the same direction in connection with the more social aspect of their gatherings. He would move—

"That the cordial thanks of the non-resident members of the Conference be given to the members residing in Plymouth and surrounding towns generally, and especially to Messrs. Clark, Balkwill, Codd, and Turney, and the other members of the Local Committee for their kind and most successful efforts in organizing the present meeting."

Mr. GROVES seconded the resolution, which was put and carried unanimously.

Mr. R. J. CLARK (Local Secretary) briefly responded, and Mr. BALKWILL also spoke of the good which these meetings did in bringing more closely together the chemists of the locality in which the Conference met, and making them feel that there were higher thoughts than those which merely belonged to their business, and that they were linked in some degree with the students in other fields of literature and science.

Mr. TURNEY proposed a hearty vote of thanks to the President for the ability and courtesy with which he had conducted the business of the meeting.

Mr. FRAZER (Glasgow) seconded the motion, which was was put by Mr. Groves, as Vice-President, and carried unanimously.

THE PRESIDENT in reply, said it had been to him a source of very great gratification to be allowed the opportunity of meeting with so many of his old friends and associates, if he might so speak of his old pupils, and with others whose names had been familiar to him, but with whom he had not been personally acquainted. He could only assure the meeting that if his services had contributed in any way to the advancement of the object which they all had in view, no better reward could be afforded him for anything he had done, which he was sorry to say had been too little. He might say, however, that the manner in which he had been received throughout would be an encouragement to him to devote himself to the interests and objects of the Conference to a greater extent than he had hitherto done.

Parliamentary and Law Proceedings.

SUICIDE OF A CHEMIST AND DRUGGIST.

On Monday the 1st inst., an inquest was held at the Railway Hotel, Southport, before C. E. Driffield, Esq., coroner, respecting the death of Mr. Thomas Makinson, chemist and druggist, of Chapel Street. From the evidence adduced it appeared that the deceased for the previous three weeks had been drinking. On the Thursday he began to wean himself from the drink, and on Friday he commenced to ramble and appeared low spirited. On Saturday night he got the idea into his head that he was being followed, and gave order that the assistant was to drive a man away. On Sunday he was very low spirited, and Dr. G. A. Woods was sent for, and he seeing the condition of deceased suggested the advisability of his friends being communicated with. Shortly after dinner on Sunday deceased got possession of a key which fitted the shop door, and took two doses of something which he said was to cool his head. Shortly after the housekeeper had got him from the shop, he sprang out of the chair in which he was reclining, and exclaimed, "I have taken poison." Dr. Woods was sent for, and on his arrival he found the deceased perfectly unconscious from opium poison, and in convulsions. He applied the stomach pump at once, and removed a quantity of brownish fluid. He had him walked about for a short time to keep him awake, and put some strong ammonia to his nose, and remained with him until he died. He had no doubt as to the cause of his death. It was a distinct case of poisoning from strong poisons, and most probably from two distinct poisons. A mixed dose of strychnia, or nux vomica, and opium, would produce all the symptoms found in this case. On a former occasion, when deceased was getting better, nux vomica was one of the articles prescribed as an ingredient in his medicine to relieve his head. Chemical knowledge would tell him that an overdose of this would cause death; but his mind was in such a state that instructions were given to his housekeeper.

The jury returned a verdict to the following effect:—"That the deceased came by his death from the effects of taking a deadly poison whilst in a state of insanity rom delirium tremens."

ALLEGED ADULTERATION OF CITRATE OF MAGNESIA.

At the Central Police Court, Glasgow, on Thursday 4th inst., before Stipendiary Gemmel, George Smith, M.D., 112, Renfield Street, Glasgow, was charged under the Sale of Food and Drugs Act, with having sold to Inspector Walker half a pound of citrate of magnesia, which was not of the nature, substance and quality demanded by the purchaser.

Dr. Smith pleaded not guilty, and at the outset questioned the legality of the prosecution on the ground that the drug mentioned in the summons was citrate of magnesia, while that which he supplied was "citrated magnesia" and was so labelled and declaration made to the inspector at the time of sale.

The Court overruled this objection, the two names being considered synonyms.

Inspector Walker and assistant proved the sale.

William Wallace, Ph.D., city analyst, deposed that the citrate of magnesia contained ·37 grain of lead per pound, which he considered might be injurious to health. Lead was a cumulative poison.

Dr. Smith: Are you aware that citric acid, which enters into the composition of citrate of magnesia, cannot be had free from lead.

Dr. Wallace: I can prepare it free from lead.

Dr. Smith: So can any intelligent chemist, on a small scale, but (to the Court) I assert that commercial citric acid invariably contains lead as a necessary contamination from the present mode of manufacture. The acid sent out by the best houses always contains a small proportion, and I do not think, speaking from a medical point of view, that the quantity present in this sample could be injurious.

Mr. Robert R. Tatlock, city analyst, corroborated Dr. Wallace's evidence.

Dr. Russell deposed: I am medical officer of health for the city. Lead is a cumulative poison, and small repeated doses often produce symptoms of poisoning. The quantity found in this citrate might prove injurious.

Cross-examined by Dr. Smith, he admitted that he had frequently prescribed citrate of magnesia in his private practice, and had not observed any poisonous symptoms follow its use, nor had he heard or read of such.

This closed the evidence for the prosecution.

Dr. Smith, on being called upon to produce his witnesses, complained of being taken unawares by the prosecution, as the summons did not state particulars and he was in ignorance of the point on which the case would turn till he appeared at the bar. He happened that morning to meet Mr. Howie of Edinburgh who might be able to tell them something, and Mr. McAdam, managing partner of the Glasgow Apothecaries' Company, was also in attendance.

Mr. W. L. Howie deposed: I am a pharmaceutical chemist. I know that citric acid and citrate of magnesia contain lead in small proportions.

The Fiscal (Mr. Lang): But this contains ·37 grain per pound.

Mr. Howie: That is about one-third of a grain per pound.

The Stipendiary: One-third of a grain?

Mr. Howie: Yes. A small fraction over the third of a grain. I do not think this is a large proportion. I have sold in the usual way of wholesale business large quantities of citrate of magnesia, and am brought into contact with those who are constantly selling it. I have never heard of injury resulting from its use. I would not consider ·37 grain per pound injurious, but this is a medical question, of which I have no special knowledge. Citric acid almost invariably contains a trace of lead from the vessels used in its manufacture.

The Fiscal: You say, "almost invariably." Can it not be made free from lead?

Mr. Howie: At present, I believe it is not so made commercially. This is a question to which makers have been giving a deal of attention, and it has been discussed in the trade journals for the past few years. The difficulty has not yet been overcome. A pure citric acid would be looked upon as a chemical curiosity.

Mr. Robert McAdam deposed: I am aware manufacturers have a difficulty in producing a pure citric acid. I have always believed citric acid, and therefore good citrate of magnesia, contained lead. I have sold Dr. Smith's article largely to druggists and doctors throughout the country, and have never had complaints; in fact, I have always had great satisfaction in selling this article. I have never heard of injurious effects being produced by the use of citrate of magnesia.

Dr. Smith craved that the case be dismissed. He, in the course of his manufacture, sent out many tons annually, and had never heard of injury caused by the use of citrate of magnesia, and, speaking as a doctor of medicine, he would be the last man to send out what he suspected might be injurious, and considered this trace of lead could not be so accounted. As a manufacturer who had a name at stake, he purchased his materials only from standard houses, his citric acid being procured from Howards and Son, London, a house whose position was second to none in this or any other country, and more than that he could not do.

The Stipendiary continued the case for a week.

Presence of Lead in Citric Acid.

At the same court, John Campbell, chemist and druggist, 83, Stobcross Street, Glasgow, was charged with having sold one and a half ounces of citric acid, adulterated with lead to the extent of ·4 grain per pound.

Mr. Campbell pleaded not guilty, and, after proof, stated that he had no witnesses to call. The assistant who sold the acid had since become insane, and was at present confined in Gartnavel Asylum, but he hoped that, as in the previous case, decision would be delayed, as the cases were parallel.

The Fiscal: No, no. This is a much more gross case.

Mr. Campbell: Just as the difference between thirty-seven and forty. I think it is very hard that I should be made a victim for the sale of an article the same as you can procure in any shop in Glasgow.

The Fiscal: That is just the reason why the adulteration should be put a stop to.

The Stipendiary: The case will be continued till this day week.

Illegal Sale of Poisons.

Prosecution under the 17th Section of the Pharmacy Act.

At the Birmingham Police Court on Tuesday, the 9th inst., before G. Goodrick, Esq., and H. Manton, Esq., Anson Edwin Martin, trading as a chemist and druggist, at 136, Broad Street, Birmingham, was summoned by William Frederic Haydon, 23, Burlington Chambers, New Street, Birmingham, Secretary to the Chemists and Druggists' Trade Association, for "That on the 27th day of September, 1877, at the said borough, he unlawfully sold to the said William Frederic Haydon certain poison, to wit, oxalic acid, in a certain packet, the cover of which packet did not set forth the name of the seller of the same, contrary to the statute in such case made and provided." Mr. Henry Glaisyer (Solicitor to the Chemists and Druggists' Trade Association), instructed by Mr. William Frederic Haydon, prosecuted, and Dr. Sebastian Evans appeared for the defendant.

Mr. Glaisyer said he was rather surprised to see that his friend, Dr. Evans, appeared for the defence, because he held in his hand what he took to be a confession that the defendant had infringed the Act. However, as the defendant appeared by his counsel he must go into the matter. The information was laid by William Frederic Haydon, Secretary to the Chemists and Druggists' Trade Association of Great Britain, and the summons was issued under the 17th section of the Pharmacy Act, 1868, which provided: "It shall be unlawful to sell any poison, either by wholesale or by retail, unless the box, bottle, vessel, wrapper, or cover, in which such poison is contained be distinctly labelled with the name of the article and the word poison, and with the name and address of the seller of the poison, and for the purpose of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller."

The facts of the case were very simple. On the 27th of September (that was, last month), Mr. Haydon went to defendant's shop, 136, Broad Street, and purchased some oxalic acid from him personally. The package containing the oxalic acid was labelled "Oxalic Acid—Poison. Morris and Co., Chemists, 87, Islington, Birmingham." Subsequently the defendant called upon Mr. Haydon and they both came to him, and defendant at that interview wrote the following letter.

"136, Broad Street,
"October 4, 1877.

Dear Sir,—With regard to the proceedings which have been commenced against me under the 17th section of the Pharmacy Act 1868, I have to say that I have been for some time past trading as a chemist and druggist at 136, Broad Street, under the name of Morris and Co.; under this name I sold the poison (oxalic acid) to Mr. W. F. Haydon, the Secretary of Chemists and Druggists' Association. In future I will trade under my own name and will abstain from selling poisons until I am duly qualified to do so.

"Yours truly.
"Anson Edwin Martin.

"To Henry Glaisyer, Esq., Solicitor,
"Waterloo Street."

Dr. Evans said they admitted the facts of the case.

Mr. Glaisyer said then he did not know what defence his friend could set up, because he thought the provisions of this section were clear.

Dr. Evans said he thought that the Bench would have seen what the defence of this was. They were charged in this summons that they did unlawfully sell a certain poison, namely, oxalic acid, on the cover of which they did not set forth the name of the seller. They did set forth the name of the seller. Stamped on that packet was the name of Morris and Co., with their address in Islington, the only point in the case was, this firm of Morris and Co. had passed through several hands. Morris and Co. established a considerable reputation as chemists and druggists a good many years ago; and when, he believed, Mr. Morris died he sold the business to Mr. Proctor. Mr. Proctor being well aware of the value of the name of Morris still retained the name of Morris, and traded under that name, and sold poisons under that name. When his client purchased the business from Mr. Proctor he still retained the name of Morris and Co., and he traded as Morris and Co. He contended that the provisions of the Act were fulfilled in that label, that, in fact, the name of the seller was upon that packet The provisions of the Act were for the purpose of identifying persons from whom poisons had been obtained; and the name of Morris and Co. being upon the packet, any person who wished to identify the seller could do so by going to the shop in Islington, and asking, who were Morris and Co.? Morris and Co. were Mr. Martin. There was no other Morris and Co. Mr. Martin was perfectly entitled to use the name of Morris and Co., as well as Mr. George Dixon was to use that of Rabone Brothers, in trading as a merchant in the town. It had been over and over again decided that it was lawful for any persons to trade under the name of what firm they pleased, whether there was a person of that name in the firm or not. And he said both the letter and spirit of the Act had been fully carried out by giving such an address as that. It was impossible that any person could be mistaken by such an address as that. They knew he kept a shop and was trading under that name. He said further than that; if Mr. Martin had put his own name upon that packet he would not have been so readily identified as by having the name of Morris and Co. upon it. The object of the Act had been more fully carried out by having that address upon the packet than it would have been had the name of the individual who actually sold it appeared. With regard to Mr. Martin writing that letter in a lawyer's office, he was taken there for the purpose of writing it. It was the most natural thing in the world for a man to do. He took it any person not knowing that it was legal for him to trade under another name would naturally write that letter. He was told by a legal gentleman that he had infringed the Act by trading under another name. But he had been doing nothing of the kind. It was under that incorrect impression that he wrote that letter. He should not carry the case any further, as in his opinion neither the spirit nor the letter of the Act had been infringed.

Mr. Glaisyer said that as his friend had rather opened up the question of the intentions and scope of the Act, he should like to offer a few remarks, and, with the permission of the Bench, he would direct their attention to the 15th section.

Dr. Evans said they were not summoned under that section.

Mr. Goodrick requested Mr. Glaisyer to proceed.

Mr. Glaisyer said he would only refer to the 15th section to show what the object of the Act really was; with regard to the identification of the seller, Dr. Evans' argument admitted of some explanation. He could not see that a man could be better identified by assuming a name that was not his own. Then again, they would see in a moment, by assuming the name of Morris and Co., and trading under that title, he was using the assumed name as a shield for the sale of poisons. The name and address of another person were assumed by unregistered men for the sole purpose of enabling them to evade the 15th section of the Act, as a subterfuge. He was perfectly aware it was lawful for a person to trade under an assumed name, except as a chemist and druggist. Dr. Evans had carefully avoided the nature of that Act, and it was under that Act alone that a person could not conduct his trade under an assumed name. He said a person could not so trade in poison, but it was for the Bench to decide the question.

Mr. Manton said they thought the Act of Parliament was clear in compelling the person who sells poison to put his name on the label. With regard to a mercantile house, they could trade under an assumed name; there were many instances of that, but they thought the Act of Parliament before them made it very clear that a person who sells poisons should put his name on the label; they would therefore fine the defendant ten shillings and costs.

John Stuart Careless, trading as a chemist and druggist at 44, Horse Fair, Birmingham, was summoned for a similar offence.

Mr. Potts appeared on his behalf, and the prosecution was conducted by Mr. Henry Glaisyer, instructed by Mr. William Frederic Haydon, the plaintiff in this case.

Mr. Potts said, having heard the last case he was prepared, on behalf his client, to plead guilty, because he believed it was quite clear in the Act of Parliament that the seller of poison should put his name on the packet. He mentioned, however, that the defendant kept in his shop a qualified registered chemist.

Mr. Glaisyer said the defendant himself was not a registered chemist and druggist, and was consequently not permitted by the Act to deal in poisons; the fact of a qualified assistant being employed in the business had nothing whatever to do with the matter. The facts of this case were very similar to those of the case preceding it, the defendant was illegally trading as a chemist and druggist at 44, Horse Fair, Birmingham, under the assumed name of Josiah Topp, a gentleman who had been dead some six years. He handed to the Bench a confession similar to the letter read in the last case signed by the defendant.

A fine of ten shillings and costs was imposed.

Obituary.

Notice has been received of the death of the following:—

On the 13th of August, 1877, suddenly, Mr. Thomas Daines, Pharmaceutical Chemist, King William's Town, Kaffraria. Mr. Daines was formerly a student in the School of Pharmacy, where, in 1852, he took the first Botany prize, the first Materia Medica certificate, and the first Chemistry and Pharmacy certificate. Mr. Daines filled for some years the post of Dispenser to the Grey Hospital, and, so highly were his services esteemed, that the Local Government, upon hearing of his death, forwarded to the family an expression of regret and condolence. Mr. Daines had also taken a very active part in many philanthropic movements, and, on the occasion of the funeral, most of the stores and shops in King William's Town were closed, as a mark of respect.

On the 23rd of September, 1877, Mr. William Davies, Chemist and Druggist, Brynmartin. Aged 28 years.

Review.

Fownes' Manual of Chemistry, Theoretical and Practical. Vol II. Chemistry of Carbon Compounds, or Organic Chemistry. Twelfth Edition. Revised and Enlarged by Henry Watts, B.A., F.R.S. London: J. and A. Churchill. 1877.

Scarcely have the pleasurable impressions left by the perusal of the first volume of the work before us died away, before they are renewed by the appearance of the second and final volume. This division into two volumes has given the editor an opportunity of treating the chemistry of carbon compounds in a more complete manner than was formerly possible.

In arrangement, the work resembles other modern treatises upon the same subject, dealing first with some general considerations and the methods of analysis practised in organic chemistry, while a most useful section on the physical properties of organic compounds brings this part of the book to a conclusion.

The study of the physical properties of homologous series of bodies is one which gains daily in importance and necessity, and it is not a little to this branch of chemical science that we must look for some explanation of the meaning of isomerism.

The greater part of the volume is occupied with the chemistry of carbon compounds, commencing with the hydrocarbons represented by the formula C_nH_{2n+2} (the paraffins), and passing on to those of the formulæ C_nH_{2n} (olefines), C_nH_{2n-2}, C_nH_{2n-4}, and C_nH_{2n-6}. The substitution products and other derivatives of these various classes of bodies are studied, and these lead naturally to azoparaffins, nitrils or cyanides, after which come the studies of alcohols, ethers, acids, amides, and carbamides.

Benzene derivatives, or the aromatic group, as its members collectively are still often termed, receive special attention, and the isomeric relations of these bodies are exhibited in a manner as precise and complete as it is yet possible to treat them. But here we cannot quite agree with the editor, who says that the classical researches of Koerner and other chemists have given "a high degree of precision and completeness" to our knowledge of isomeric relations. What we know of isomeric relations is not much, and we know yet less of isomerism itself.

The application of the theory of structure or "positions" to carbon compounds is an exposition of views, but it affords no real explanation of isomerism; it is possible to give a symbolic representation of certain facts, but the moment that this representation is stated to exhibit the structure of the bodies in question, it becomes the purest hypothesis. It is often urged that the chemists who use structure formulæ do not intend them as absolute expressions of the true structure of the molecules they are dealing with, but merely as instruments of teaching to exhibit plausible relations existing between various compounds. But in spite of this, the editor of the volume before us writes: "The structure of these isomeric hydrocarbons may be illustrated by the following figures." He is here writing of methyl-, dimethyl-, and ethyl-benzene, etc., and he uses the expression "structure" as if chemists were really acquainted with the structure of bodies. They are not. They know of the existence of large groups of compounds and their methods of preparations; also how by substitution or replacement or otherwise these may be changed one into the other or made to yield a number of other new compounds. From the methods thus employed, and the composition of the products, certain relations between compounds become more or less visible, plausible, and established. This knowledge often enables one to understand why two bodies, *a* and *b*, should be isomeric, but there our knowledge ends; we know no more of the structure of bodies than we do of the beginnings of life, and less than we do of vital force.

The naphthalene, phenanthrene, and anthracene groups, as also those of the terpenes and camphors, glucosides and alkaloids, are described later on in the work. Although a few pages are devoted at the end of the treatise to bile constituents, albuminoids, and brain constituents, yet to all intents and purposes physiological chemistry is omitted in the present edition of Fownes' 'Chemistry.' This cannot be considered otherwise than as an improvement, for physiological chemistry is a department of the science at once as important and requiring special treatment as comprehensive as that of general organic chemistry. The observations on bile and brain chemistry, although so brief, are not free from error, and are not even well chosen in our opinion. Otherwise, the volume as a whole is particularly sound in the knowledge it imparts, and recommendable, and, as may be immediately perceived on perusal, it embraces even very recent researches.

BOOKS, PAMPHLETS, ETC., RECEIVED.

Notes on the Treatment of Skin Diseases. By Robert Liveing, A.M., and M.D., etc. Fourth Edition. London. Longmans. 1877.

Dispensing Memoranda.

We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be considered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.

[28]. O. Wallis has overlooked the action of sulphates on acetate of lead. The clear liquor after subsidence made according to his suggestion will give no sign of lead with iodide potassium. It occurs to me that amongst a number of analyses of hair restorers in a paper in the Journal one was found which gave no precipitate with iodide potassium—may not the ordinary lac. sulph. containing calcium sulphate have been used here?

I remember it was suggested that hyposulphite of soda might have been used, but am I wrong in supposing it would, equally with calcium sulph., render the lead insoluble?

If Mr. Brookes moistens the sulph. præcip. and plumb. acet. with spirit or tinct. canth., and rubs smooth with a portion of glycerine, I think his difficulty will vanish.

J. Savage.

[31]. I have had a prescription brought me this week to be made up, the writer of which is a qualified "doctress," and of which the following is a copy. I thought perhaps some of your readers might tell me the best way of dispensing it, having tried many ways to get the camphor even suspended, without success. Should I be justified with using one drachm instead of ounce?

℞ Pulv. Camphoræ . . . . . . ℥j
Hydrate Chloral . . . . . . ℥j
Mix and dissolve in glycerine, ℥vi.

Sig.—To be applied to the spine, once or twice daily, with a brush.

J. S. P.

Cambridge.

[32]. Lin. Saponis.—I made, a month ago, two pints of Lin. Saponis, B.P., but with soap marked, "Sapo Animalis, B.P." In a few days it was solid, but became a thick liquid by brisk agitation. I added to it the quantity of ingredients necessary to make another Oij, omitting the soap; but no amount of agitation will now move it, it is so solid. No heat was employed save that developed by the admixture of the spirit and water. If any one will inform me as to the best way of making this fluid, I shall be extremely obliged.

Burton.

Notes and Queries.

[555]. LIP SALVE.—N. S. H. will be obliged for a good formula for Lip Salve.

[556]. SYR. FERRI PHOSPH. CO.—In making this preparation from Mr. E. C. Saunders' formula (*Pharm. Journ.*, July 15, 1876), as well as from nearly all others published, I find the process successful and promising a good result up to the stage of adding the sugar; as soon as this is dissolved failure appears to be the result. The product, instead of being the nice clear syrup Mr. Saunders speaks of, is a frothy, muddy one, containing what seems to be a gelatinous precipitate, and is deficient in depth of colour, and I think rather too sour.

Mr. Saunders' formula seemed to promise well, but turns out the same as others; the syrup can be cleared by filtration, but this is a tedious process, and involves the loss of the precipitate.

I should be glad to learn what is the cause of the difficulty and what the remedy, also how the deep red colour is obtained, as I can only get a brownish pale red from the published forms.

PHOSPHATE.

Correspondence.

**** No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

COUNTER PRESCRIBING.

Sir,—An important contribution to the discussion of this subject (see report of late Council meeting) may be thus paraphrased.

"In the first place, there is a distinct right on the part of the public to go wheresoever they please for poisons or anything else. No one in the world thinks that a person who goes to the veriest huckster or grocer for poisons is actionable at law, yet it would be extremely difficult to prove logically that the receiver is not just as guilty as the vendor. If a person, knowing me not to be a registered chemist, choses to purchase poisons from me, that person is as much to blame as myself; the only point of importance being that the person purchasing poison should not be deceived as to the registration of the person selling it. This is such palpable common sense that it appears to me there might be founded upon it some ground for inferring what is the difference between legitimate and illegitimate sale of poisons. I think it would be infinitely better that the Council should endeavour to prevent these difficulties than to bring actions afterwards."

Or for poisons, read wines, spirits, tobaccos, or any other restricted commodity. FUI.

October 8, 1877.

"WHAT IS THE CHEMISTS' ASSISTANTS' ASSOCIATION DOING?"

Sir,—The above question is, I am told, very frequently asked; kindly allow me space in your Journal to give an answer which I venture to think will be satisfactory to all interested.

The Committee of the Chemists' Assistants' Association are not idle, but are endeavouring to find rooms suitable for their purpose, and to obtain members, whose subscriptions will enable them to render more immediately apparent the benefits to be derived from this association.

The Committee have considered the desirability of renting rooms during these summer months, and seeing that assistants generally are enjoying their annual relaxation from "white slavery," and that most of the societies of the metropolis observe the months of August and September as a time of rest, they have thought it best to husband the funds and commence their first session in October, when assistants will be back in town and the various pharmaceutical schools full of students.

It may be rather premature to set forth a project which has been discussed by the executive of the association, but not yet decided upon. In the hope of obtaining suggestions and opinions I will make it known: The idea is to commence the session with a social and scientific meeting, to be open to employers as well as assistants. Many will remember with pleasure the soirees, formerly held under the auspices of the Pharmaceutical Society, which have developed into the present conversazione at South Kensington. This conversazione is considered by some rather too "stiff" an affair, and a more social gathering arranged and managed by themselves would perhaps find favour with assistants.

A rumour obtained currency in June last, and was referred to by your correspondent, "A Public Servant," that this association would provide a register of houses which are not closed at or before a certain hour, and other matters which are considered drawbacks to assistants' comforts, or that the projectors intend to regulate hours of business, salaries, etc. These reports, I, as one of the originators of the movement, may state are entirely without foundation. The Committee have met frequently, but I have failed to discover any tendency to trades' unionism in the utterances of the members. In fact, the general opinion is that more may be done to benefit assistants by bringing them in contact with each other, and by creating if possible a better feeling between themselves and their employers, than by coercion. Moreover, it would be inconsistent for assistants to attempt coercion to-day who would a few years hence be liable to receive similar treatment from the hands of their own employees.

A singular feature has come under the notice of the Committee, viz., the almost universal sympathy afforded the movement by employers, who, while acknowledging the desirability of such an association, which they say would have been useful to them when assistants, are unwilling to supply pecuniary aid, but in lieu thereof some have dispensed "cold water *ad libitum*," one well known and generally respected pharmacist having expressed his opinions so strongly that one of his assistants when asked to become a member of the Chemists' Assistants' Association, he replied, "I should like to, but the governor would not like it!" Does not this sound very like coercion on the part of one employer? This statement, I am happy to say, does not apply to all, and those gentlemen who have kindly given more than sympathy have the best thanks of myself and colleagues.

As a public journal is not the place to enter into particulars fitted more for an advertisement, I shall be pleased to answer all questions concerning the association, and trust your correspondents will address their inquiries to me instead of troubling you with anonymous communications to which they can hardly hope to receive answers. Apologizing for taking so much space.

E. CARDWELL,
Hon. Sec. to the Chemists' Assistan's' Association.

92, *Kirk Dale, Upper Sydenham, S.E.*

OLEUM FOLII PINI SYLVESTRIS.

Sir,—There are, I think, few natural orders yielding richer supplies and presenting a greater number of points of interest to the pharmacist and manufacturer than the coniferæ order. In this opinion I am, I believe, supported by the late Mr. Daniel Hanbury, who so frequently selected the turpentine and resinous products as a subject for close examination of candidates for the Major qualification of the Pharmaceutical Society.

But considering the very able and exhaustive series of papers which are in course of publication in the Journal, by Dr. Julius Morel, of Ghent,* it would clearly be out of place for me to contribute more on the present occasion than that which is the object of this little note.

In 1872, the 'Throat Hospital Pharmacopœia' was published, under the editorship of Dr. Morell Mackenzie, and in the materia medica portion of it, p. 18, oleum folii pini sylvestris is mentioned as entering into a preparation called vapor pini sylvestris.

This vapour is now ordered to a considerable extent, and my own experience has shown me many instances in which the oil has simply been written ol. pini sylvestris, and but a short time ago, a case occurred in which the dispenser used oil of turpentine prepared by incision and puncturing the trunk of the sylvestris pine, and subsequent distillation

* *Pharmaceutical Journal*, August 4, p. 81, and two previous weeks.

—instead of that prepared by distillation from the leaves of the common Scotch pine, which preparation was presumed to have been understood.

The fault, however, was not altogether on the part of the dispenser, for, as a foot-note in the T. H. P. points out, this oil (ol. folii pini sylvestris) is not to be confounded with oil of turpentine; it is prepared from the leaves of the *Pinus sylvestris*, and is well known in Germany, whence it is imported as fir wool oil. It is also largely sold in this country and on the continent as a patent medicine for external use in rheumatism.

Under these circumstances, the conclusion to which one naturally arrives is, that physicians should in all cases when they order this vapour, do so precisely according to the directions given at page 86 of the 'Throat Hospital Pharmacopœia,' namely, *vapor folii pini sylvestris*.

A. W. POSTANS.

35, *Baker Street, W.*

THE USE OF TURPENTINE AS A BLEACHING AGENT IN LAUNDRIES.

Sir,—For some time I have been aware of a fact which, in the light of recent investigations, possesses new interest.

In some laundries a little turpentine is added to the pan containing the boiling solution of soap and the linen, ebullition being kept up briskly for a little while; the result is stated to be very satisfactory in producing additional whiteness and cleansing.

I had other theories to account for the effect, but, since the publication of Mr. Kingzett's experiments and the introduction of his "Sanitas," I think we may be justified in saying that while the washerwomen have been loud in their statement of "no chemical used," they have unwittingly secured the action of peroxide of hydrogen, and in one of its developments anticipated an interesting discovery.

It appears to me that this method adopted for bleaching is worthy of publicity; also as a very simple, easy, and effectual process for the domestic disinfection of linen, etc.

JOHN WHITFIELD.

Scarborough.

DANGEROUS COLOURED FIRES.

Sir,—As in the report of the unfortunate accident to Mr. Lloyd, in a recent issue, the last paragraph might lead some of your readers to conclude that by mixing the coloured fire upon paper perfect security is obtained, I think it is my duty to warn my brother chemists that such is not the case. Last evening a similar thing happened in my shop from the spontaneous ignition of a coloured fire which (as in Mr. Lloyd's case) had been made for the theatre; but happily it was unattended with any more serious results than the destruction of the mats, etc., which were immediately thrown upon the burning mass, and causing some alarm to the neighbourhood. I wish to draw attention to the fact that the compound was mixed upon paper, with a bone spatula. As it is probable that some formulæ may be more dangerous than others, it may be of interest to mention—particularly with the Guy Fawkes anniversary approaching—that the mixture in question was made according to form No. 5 for Green Fires, in Beasley's 'Druggists' Receipt Book.'

JOHN T. WINDLE.

Chesterfield, Sept. 26, 1877.

Mr. R. O. Fitch writes, in reference to the recent prosecutions under the Apothecaries Act, reporting the details of a case which illustrates the fact that medical assistance cannot always be obtained when required. This is so self-evident, as well as the inference to be drawn from it, that we refrain from publishing the letter *in extenso*.

F. J. B.—(1) See a paper by Mr. Bickerdike on the chemistry of the tar antiseptics, in *Pharm. Journ.* [3], vol. v., p. 541. (2) For dialysed iron, see formula in present volume, p. 27, using solution of ammonia, sp. gr. ·924; also pp. 48 and 84.

T. P. Iliff.—Your post-card has been handed to the Secretary, to whom all communications respecting change of address or non-receipt of the Journal should be sent.

Mr. Howie is thanked for his communication.

Fides.—Although we wish to allow considerable latitude to the Dispensing Memoranda they can hardly be made to include notes on the "making of artificial or real rum, brandy, or gin." Such information, however, is not difficult to find if sought in the proper place.

F. Gall.—*Polygala vulgaris.*

J. T. Fox.—(1) *Galium palustre;* (2) *Veronica Buxbaumii;* (3) *Linaria Elatine.*

"*Syrupus.*"—(6) *Hypnum cupressiforme;* (7) *Hypnum resupinatum;* (8) *Didymodon rubellus;* (9) *Didymodon rubellus*, mixed with *Anomodon viticulosus.*

J. Houlton writes to suggest that the Medical Defence Association might turn its attention to the prosecution of village parsons who prescribe to their own parishioners, wives of country squires, who are apt to fly to their medicine chests in cases of emergency, or even Giles, the ploughman, who has his panacea in the shape of pills made from turpeth mineral, gamboge and calomel.

"*Neanias*" writes to complain of the little or no result that has followed the meeting held some months since in respect to early closing, and that promises made at that meeting have not been carried out.

St. Ignatius.—No provision is made in either the Pharmacy Act or the Arsenic Act for the exemption of the sale of small quantities of scheduled poisons from the operation of the ordinary regulations applying to the sale of such poisons.

T. B.—The description given is too indefinite to allow of the expression of an opinion. You are recommended to submit the substance to analysis.

Chamomile.—We are unable to give you the information asked for, but we do not think that the electric light can at present be applied economically to the lighting of dwelling houses.

T. S. Edwards.—We are aware that a rule exists prohibiting candidates from passing the Minor examination until they have attained the age of twenty-one years; but as the passing of this examination is the legal qualification for carrying on the business of a chemist and druggist we cannot agree with you in stigmatizing the rule "as an injustice and an insult to human nature and common sense." Probably as your judgment matures your opinion will approximate more closely to our own.

J. J. C. asks is it not time to "protest, as a body against such palpably unfair decisions as magistrates have been giving lately in the cases of soda water and castor oil pills? for although the next generation learning wisdom by our experience will no doubt be more careful in their nomenclature, surely there must be some way of shielding ourselves from such unjust attacks upon vested interests." Our correspondent thinks, however, the task may prove to be harder than would at first be expected.

"*Pharmacist*" also writes criticizing a recent letter from "A Druggist of nearly Half a Century," on the same subject, and says that if the latter gentleman would put aside an unkind prejudice he might learn that the proprietor or proprietors of these articles were not culpable in adopting their names, and had no desire to deceive. If our correspondent would show what argument could be advanced in favour of the practice of giving such misnomers it would, in our opinion, be more to the point.

"*Quaesitor Sum.*"—We do not know.

W. L. Pearce.—We suspect a misreading of the prescription and would like to have an opportunity of examining the original.

H. Hemstead.—Garrod's 'Materia Medica' is published by Messrs. Longman and Co.

G. C. Walton.—Probably *Prunus Avium*; it is not possible to say from the leaves alone. The grass is rightly named; it is not uncommon.

G. R. Durrant.—A gall produced by *Rhodites Rosæ*, L., and known as Bedeguar, or Sweetbriar Gall.

W. R. Fowler.—(1) Any of the leading Manuals of Chemistry might be followed. (2) The conditions that obtain in different localities are so various that it would be impossible to draw up rules that would be applicable in all cases; these must be decided upon by those residing on the spot.

W. G.—Your question is not sufficiently definite.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Kinnimont, Mr. Barnard, Mr. Fowler, Mr. Gilmour, Mr. Schacht, Nemo, Malva, B.B.B., B.J.K.

THE CULTIVATION OF MEDICINAL PLANTS AT HITCHIN.

BY E. M. HOLMES, F.L.S.,

Curator of the Museum of the Pharmaceutical Society.

The neighbourhood of Hitchin is one which is interesting on many accounts. The spot which Dickens has immortalized as Tom Tiddler's Ground is within a few miles of the town. The geologist will notice here the outcrop of the London basin, and the antiquary will meet with much to examine in the way of flint implements and other ancient relics. The botanist will find in the spring abundance of the rare *Anemone Pulsatilla* within a few miles of the town, and cannot fail to admire the row of ancient box trees, with trunks fully a foot in diameter, and about twenty feet high, which are conspicuous by the roadside near the centre of the town. These are probably the largest and oldest box trees in England. A curious feature in this district is the straw plaiting, which is carried on almost mechanically by women, even as they walk along the streets or through the fields to their work; their eyes keenly observant of all around them, and their talk seasoned with remarks, often more shrewd than polite, upon the passers by. On a Tuesday, which is the market day, the town often presents a busy scene, sometimes as much as £1000 worth of straw plait changing hands in one day. This is chiefly bought up by middlemen from Luton and Dunstable, who supply the peasantry with prepared straws for the purpose. For the pharmaceutist, however, the chief attraction of course lies in the fields of medicinal plants which are scattered all around the town.

The plant which is most extensively grown in the neighbourhood of Hitchin is the lavender (*Lavandula vera*, D.C.). The cultivation of this plant was commenced in 1823, by Mr. Perks, and at the present time is carried on by his son, and also by Mr. Ransom, who commenced its cultivation in 1847. It is to these two gentlemen that our readers are indebted for most of the interesting facts which are embodied in this paper. Both these gentlemen have received medals for the excellence of their productions, Mr. Perks for oil of lavender, and Mr. Ransom for essential oils and pharmaceutical products generally.

The crop at present grown is much affected by the presence of a disease which attacks the plants just as they are beginning to flower, and causes them to wither away by degrees. This disease occurs not only at Hitchin, but also at Mitcham (in fact, it appeared at Mitcham before it was known at Hitchin), and so far as I have been able to ascertain at all the localities in which lavender is grown. To such an extent has it occurred at Market Deeping in Lincolnshire that Mr. Holland, who formerly cultivated lavender there, has now ceased to grow it. The disease prevailed to a considerable extent this year, and on this account and by reason of the smallness of the crop, the price of oil of lavender will probably be unusually high.

The history of the cultivation of lavender reveals some curious facts which may perhaps throw a little light upon the probable cause of this disease. Formerly the plant was propagated by slips taken from the branches, for the plant does not ripen seed. Whether or not it has lost the property of ripening seed through cultivation, as has been the case with the rhubarb plant at Banbury, I have not been able to ascertain.

In the winter of 1860, owing to a very severe frost, nearly all the lavender plants were killed, and to secure a crop for the next year, instead of taking slips, the roots were parted, and from that time to the present the same mode of propagation has been continued. About this time (1860), the disease first appeared.

Plants which are obtained by parting the roots of one year old plants are much more vigorous and less liable to the disease than those obtained by dividing the roots of those of two years' growth.

The first appearance of the disease is indicated by the leaves of one or more branches drooping and withering away; and the remainder of the plant becomes affected by degrees. When the root of a diseased plant is pulled up the rootlets appear fewer in number than in a healthy plant, and the woody portion from which the rootlets spring is often covered with a white filamentous mycelium, but sometimes only presents a dark colour and wet appearance internally.

The appearance of the disease just as the plant has begun to flower, and the fact that the plants now come to maturity in about three years, whereas they used to last five or six years, seems to indicate that the tendency to produce flower and foliage has been stimulated to a greater degree and caused a greater demand upon the root than it is able to meet. The vitality of the plant has probably been lowered by years of reproduction from the stem instead of in the way that nature has appointed, viz., by the seeds. The method of propagating at present adopted is certainly one that is very likely to continue the disease, since it may be latent in the divided root of apparently healthy plants. That the disease is not likely to be owing to difference in soil is shown by the fact that fresh soil or otherwise, manure or no manure, make no difference in its appearance.

The method of cultivation is as follows:—

The harvest of lavender flowers is rarely over until the middle of September, so that it is not possible to get the ground cleared and ready for the fresh plants before the end of October or beginning of November. The ground which is to be planted is generally manured beforehand with thirty to forty-five tons of stable manure per acre, but manure is not applied afterwards until a fresh planting takes place. The roots of the old plants are parted sometimes from two, but preferably from one year old plants, and the sets dibbled in rows about eighteen inches apart. The young plants make a start in growth in March, if the weather be mild with gentle showers, and increase considerably in size in April and May, so that the tufts become on an average about a foot in diameter. If, however, there occur heavy rains so that the leaves are much splashed with soil, the growth is somewhat stopped. In hollows, or where the damp is liable to remain, the young flowering stems, if there be frost in May, are frequently nipped, and the plant either dies or does not send up fresh flower-stalks until the end of June, making the harvest a late one. Black frosts do not, however, injure the plants.

The sets, if made by parting the roots, flower the first year; if, however, slips from the branches are taken, they are not allowed to flower the first year lest the young plants should be weakened thereby, but the flower shoots are clipped down close to the stem.

In the second year every alternate plant is removed in the autumn and planted elsewhere, leaving the others one yard apart. The second year the plants attain a diameter of about 15–18 inches, and in the third year the tufts are from 2 to $2\frac{1}{2}$ feet across.

Shade has a pernicious effect upon the plants; under the shadow of trees they become starved and produce scarcely any flowers. The growth of other plants between the rows also injures the crop. Weeds too have to be kept down. In order to prevent injury to the roots of the lavender plants while removing the weeds, Mr. Perks uses an instrument of sufficient width to pass easily between the rows, and composed of a number of hoe-like blades, the upper portion of the instrument being like a plough. By means of this apparatus he is enabled to cut off the weeds just below the surface of the ground, and at the same time to avoid injuring the tender roots of the lavender. The plants grow best and produce most blossom when they have plenty of room and sunshine. If too crowded, flowers are only produced from the centre of the tufts and not from the sides where the plants come in contact with each other.

The weather has considerable influence upon the yield of essential oil. If the days are bright and sunshiny during June and July the yield will be a good one, but if wet and dull very often not half the average will be obtained. Mr. Perks informs me that a 200 gallon still will yield about $1\frac{1}{4}$lb. of essential oil in a good season, but in a bad one, as in the present year, barely twelve ounces.

The time at which the flowers are gathered also appears to modify the yield, Mr. Ransom giving as the result of his experience that the product is very much reduced if gathered after the first week in September, the largest quantity of oil being obtained about the middle of August.

In collecting the harvest, which usually begins about the first week in August, the flowerstalks of one plant are grasped as far as may be with one hand and a sickle is used with the other. They are (by Mr. Ransom) then packed in eight-bushel sacks, and carried direct to the still, about fourteen sacks going to a 1000 gallon still; or they are tied up in bundles weighing about twenty-two pounds (by Mr. Perks) and as much as possible of the stalks afterwards cut off and the still then filled up with the flowers. The distillation is commenced at four or five o'clock in the morning, and the still is filled four times a day, the men leaving work at 10 p.m.

The distillation of each quantity takes about two and a half hours, the largest portion of oil coming over during the first hour and a half. A considerable time is of course taken up in filling and emptying the still. The flowers are trodden down in the still by boys, who for the first day or two are often severely stung by the bees which cling most pertinaciously to the blossoms, and appear to be quite intoxicated with the honey of the lavender, especially towards the end of the season.*

The water which comes over with the oil during the first hour, being slightly impregnated with oil, is returned to the still, but that which comes over afterwards is allowed to run away.

The oil which comes over after the first hour and a half is either redistilled or sold as inferior quality. The refuse when removed from the still is thrown into heaps, and when decayed is returned to the lavender fields. In a good year the lavender yields from four to six Winchester quarts* of essential oil per acre, and as about fifty-three acres altogether are cultivated the average yield of oil for the whole of Hitchin is about two hundred and forty Winchester quarts per year.

The quality of the oil is said to be affected by the soil and situation in which it grows, so much so that Mr. Ransom informs me he can distinguish the oil obtained from different fields by the odour alone. The oil is improved by keeping, up to three years, after which it begins to deteriorate unless mixed with spirit.

Redistillation also improves the quality of the oil, but unless conducted by steam heat the loss sustained is not compensated for by increase in commercial value, the loss being nearly one pound in the gallon.

The stems are not distilled, as the oil obtained from them is of very inferior quality, and is so small in quantity that it does not pay for labour and fuel.

The lavender grown by Mr. Ransom is distilled by steam heat, by which any tendency to an empyreumatic odour is avoided.

Belladonna.

About eight acres are grown of this plant, from which extract is made on the spot. The plants are raised from seed, and being perennial are grown on the same ground from seven to ten years, when they are replaced by fresh ones.

The crop is not cut the first year, but in the middle of June of the second year, and again at the end of September. The plants usually attain the height of rather more than two feet, but if heavily manured they will grow much larger. It is found, however, that in plants which show large leaves and grow rapidly the medicinal properties are less powerful in proportion, even the odour of the plant being weaker.

This is somewhat analogous to what is known of the cinchona trees, in which as a rule, the smaller the leaves the larger the yield of alkaloid. About five pounds of extract are obtained from one cwt. of herb.

Hemlock.

Very little hemlock is grown, the wild plant being preferred. It is said to be plentiful in the neighbourhood, nearly twenty tons of it being sometimes made into extract in one year by Mr. Ransom. From four to six pounds of extract are obtained from one cwt. of herb.

Squirting Cucumber.

Only two to three acres of this plant are grown every year, there being comparatively little demand for elaterium in this country. The plants are earthed up in winter like celery and require plenty of manure applied annually. The yield of elaterium depends much upon the weather, very little being obtained in a wet season. If the month of August is fine and dry the yield is not only larger but of superior quality. The drug as pre-

* After the first day or two, according to Mr. Ransom, the boys become so insensible to the poison that they feel but little pain when stung.

* A Winchester quart holds about five pounds avoirdupois.

pared by Mr. Ransom is of a fine ash green colour and comparatively sweet odour. This result is obtained by pouring off the supernatant liquor as soon as possible after the elaterium has deposited. If this be not done, fermentation is soon set up and the product depreciated in quality. Although Mr. Ransom probably grows more than any one else in England, the demand is so small that some wholesale houses have often not purchased more than two ounces in twelve months. That which is exported goes chiefly to Russia.

HENBANE.

About five or six acres of the biennial plant are grown on the average; but the quantity varies very much, being almost a total failure in some years. Mr. Ransom's experience corresponds with that of Mr. Usher of Banbury as regards the uncertainty attending the appearance of the plant from the seed. Indeed in one of the fields at Hitchin, in which lavender plants two years old were in blossom at the time of my visit, only the biennial henbane had come up, which had been sown before the lavender was planted there.

A small quantity of marshmallow is also grown by the riverside, where it does well.

The above are, I believe, the leading medicinal plants which are grown in the neighbourhood of Hitchin.

Mr. Ransom produces at his extensive laboratory a very large number of extracts, essential oils and liquors, and many of these in very large quantity, using as much as 40 tons of dandelion root per annum. Some of the extracts are such as are rarely asked for in retail shops, but for which there must be local demands. Among these were noticeable the extracts of sarsaparilla, *Actœa racemosa*, *Chelidonium majus*, *Datura Tatula*, *Saponaria officinalis*, wormwood (*Artemisia Absinthium*), angelica (*Archangelica officinalis*), centaury (*Erythrœa Centaurium*), pulsatilla (*Anemone Pulsatilla*), blessed thistle (*Carduus benedictus*), walnut (*Juglans regia*), white horehound (*Marrubium vulgare*), buckbean (*Menyanthes trifoliata*), St. Ignatius's bean (*Strychnos amara*), senega, and the alcoholic extract of belladonna and ipecacuanha. The extract of Ignatius's bean is used for epilepsy and goes chiefly to Australia and China. To give an idea of the extent to which some of these uncommon extracts are used, it may be stated that as much as thirty or forty pounds of extract of *Ignatia amara* is turned out annually. All these extracts are made in steam evaporating pans, the juice being in many cases expressed from the plants or roots under an hydraulic pressure of 300 tons.

A prominent feature in the laboratory is the apparatus for making scammony resin from the root. This is obtained by percolating hot spirit through the powdered root. As expression of the root after percolation would involve considerable loss, and the last portion of spirit has to be displaced with water, considerable trouble has to be taken in freeing the resin from aqueous extract. In dissolving the resin of scammony of commerce in ether a small amount of insoluble matter will often be found, which is probably matter of this kind. Economy of fuel is provided for as far as possible by causing the hot water from the steam pans, etc., to pass into a large tank from which it is pumped by the engine into the boiler, etc., as required. The latest improvements have been adopted, even to the use of a patent for preventing the escape of steam while allowing the hot water to escape.

In conclusion, one word of caution is necessary to those who may feel inclined to visit Hitchin. The lavender fields are a sight well worth seeing when in full flower; the handsome red admiral (*Vanessa atalanta*), the tortoiseshell (*V. urticæ*), the gorgeous peacock (*V. Io*), the brimstone (*Gonepteryx rhamni*), and even the clouded yellow butterfly (*Colias edusa*), as well as many commoner species, are to be seen in great force hovering over the lavender flowers. But let not the visitor be tempted to chase the lovely insects, for most formidable and by no means beautiful is the harvest insect, which seems to have an equal predilection for lavender fields and manifests a peculiar desire to leave an impressive reminiscence with all who venture among the blossoms, and no one who has made its acquaintance there will ever forget Hitchin.

THE FLUID EXTRACT OF JABORANDI.*

BY FRANCIS V. GREENE, M.D., U.S.N.

In the experiments undertaken to test the therapeutic effects of jaborandi, which was introduced to the notice of the profession in Paris in 1873, by Dr. Coutinho, of Brazil, as a powerful sialogogue and diaphoretic, Rabuteau, Gubler, Rolin and other physicians of that city employed the remedy in doses of from four to six grams, infused in hot water, the dregs being swallowed along with the liquid. The same plan of administration was adopted in other parts of the Continent. In England, Ringer and others prescribed a tincture representing thirty grains to the fluidrachm, which necessitated the administration of two fluidrachms, as the equivalent of the four grams used in making the infusion.

Having, in September, 1875, received from Pernambuco, Brazil, a sufficiently large supply of the leaves for an extended trial of the new drug, I determined to employ a fluid extract in the investigation I purposed making in regard to its action on the economy, and, after several failures, succeeded in making a preparation which, in every instance it was administered, produced all the effects obtained from the infusion made from a drachm of the bruised leaves. The results obtained with this fluid extract in a series of experiments, conducted mainly at the U. S. Naval and St. Joseph's Hospitals in this city, were so satisfactory and so confirmative of the experience of foreign observers, in regard to the efficacy of the jaborandi, that I communicated them to the Bureau of Medicine and Surgery, Navy Department, in the form of a report, which was subsequently published in the *Philadelphia Medical Times*, of October 30th, 1875.

In the investigation pursued at St. Joseph's Hospital, I was very kindly assisted by Dr. John M. Keating, who, on entering upon his term of service as Visiting Physician of the Philadelphia Hospital, in January, 1876, immediately introduced the use of jaborandi into the wards of that institution, where its application and action have since been carefully investigated by himself and colleagues. In a late very interesting clinical lecture on the subject, which has been presented to the notice of the profession through the columns of the *Philadelphia Medical Times*, of June 23rd, Dr. Keating states that the conclusions arrived at are strongly in favour of jaborandi as a safe and effectual remedy in various forms of disease. In the above-mentioned hospital it has become the practice to administer the drug in the form of an infusion of the leaves, as it was found that the preparations in the market could not be depended on to produce the desired action on the skin and salivary glands. As the same complaint has been made by a number of the profession, who have not succeeded in obtaining the proper effects of

* From *The American Journal of Pharmacy*, August, 1877.

the medicine with the preparations used by them, and as I know by experience that, as far as the fluid extract is concerned, a convenient and reliable preparation can be made with very little difficulty; I deem it advisable to call attention to some points in regard to physical characters of the jaborandi leaves, which, I believe, will account for the failures that have been experienced in making the fluid extract.

On examining a leaflet of jaborandi, we find that it is coriaceous in texture, and that, in addition to a prominent midrib, it contains a large number of veins which, leaving the midrib at an angle of about 60°, run in a parallel line to within a quarter of an inch of the margin, where they anastomose. The cellular tissue, which is covered with a tough epidermis, is studded with numerous receptacles of secretion, which give the leaflets their pellucidly punctate appearance, when held up to the light. As the result of this peculiar construction, when the leaves are ground in a mill, the woody structure is readily reduced to powder or very fine fibres, while the cellular portion is merely broken up into small fragments, still covered by the epidermis. If the material be moistened in this state with the menstruum, and placed in a percolator in small quantities at a time, it will be found in packing it, that it will spring up against the fingers as soon as the pressure is removed, and if, notwithstanding this fact, the percolation is proceeded with, on the addition of more menstruum the material will separate into several portions or layers, and the operation be thus rendered a failure. To prevent this separation, I have found it to be essential to reduce the leaves to a *moderately fine* powder; but, as even in this condition the cellular tissue was not so thoroughly disintegrated as to entirely overcome the tendency to the formation of channels in the packed mass, I furthermore adopted the plan of placing a thick layer of well-washed sand on top of the cloth covering the material, and in this way succeeded in obtaining a satisfactory precolate.

The menstruum that I have used to exhaust the jaborandi leaves has invariably been a 50 per cent. alcohol, which extracts the active principle promptly, as it is quite soluble in both alcohol and water.

With the above explanation of what I consider to be the cause of the failures that have hitherto occurred, I would suggest the following formula and directions:

FLUID EXTRACT OF JABORANDI.

Take of
Jaborandi leaves, in moderately fine powder, 16 troyounces.
Alcohol (50 per cent.), ... a sufficient quantity.

Moisten the powder thoroughly with the menstruum, pack in a conical glass percolator, place a layer of two inches of well-washed sand on top of the cloth covering the material, add menstruum until the liquid begins to drop from the percolator, when the lower orifice is to be closed with a cork, and the percolator, securely covered, set aside in a moderately warm place for four days. At the expiration of this time remove the cork, and add more menstruum by degrees until the material is exhausted. The first fourteen ounces of the percolate are to be reserved, and the remainder evaporated on a water-bath, with constant stirring towards the close, to two fluidounces, which are to be added to the reserved portion. If the percolation and evaporation have been properly performed, the fluid extract will not require to be filtered.

As the use of sand in the manner mentioned above appears to be called for theoretically in the case of a material like jaborandi, for the reason that in furnishing the required pressure, it secures the uniform distribution of the menstruum from the surface of the material through the whole extent of the mass, which point constitutes the essence of the process of displacement, its employment might be very advantageously extended to the percolation of various other substances, where difficulty of a similar nature is experienced.

THE CARRAGEEN CROP.*

To the great majority of people, carrageen, under the more familiar name of Irish moss, is known chiefly as the basis of a pleasant and wholesome drink for the sick room, or as an article of use in the preparation of delicacies for the table. Comparatively few are aware of its wide and varied use in the arts, or that the thousands of barrels of it employed annually by our manufacturers of paper, cloth, felt and straw hats, etc., and by brewers, is not an Irish, but an American product, and, strictly speaking, is not a moss, but a seaweed.

Carrageen (*Chondrus crispus*) is to be found, more or less abundantly, all along the northern coast of the United States, ranging between the low water line and the depth of forty feet or so; but, as a rule, its fronds, which correspond to the leaves of air plants, are so numerously inhabited by small mollusca that they are spoiled for other use. The clean-growing article seems to be limited almost wholly to certain ledges in the neighbourhood of Scituate, Massachusetts—a section of coast guarded by the celebrated Minot Ledge Lighthouse, and famous for its danger to shipping. Here, where the waves of the Atlantic dash with full force upon the rocky coast, the carrageen grows to perfection; and, wherever it escapes the spawn of mussels and other shell-fish, is gathered during the summer season in vast quantities.

The harvest begins in May, and ends about the first of September. The gathering is made in two ways—by hand-picking, during exceptionally low tides, and by means of long-handled iron-toothed rakes, at ordinary tides. Of course, the work cannot be carried on except during fair weather. Hand-pulling is possible only during the bi-monthly periods of spring tides, that is, when the moon is full, and again at new moon. At such times, high tide occurs about midday and midnight, and the ledges are exposed for moss gathering morning and evening. The mossers' boats are rowed to the rocks where the finest grades abound, and the gatherers select with great care the growths that are freest from minute shells and other foreign matter. This portion of the crop, if properly handled afterwards, generally goes to the apothecary, and fetches a price two or three times that of the common grade.

As the tide rises, the pickers are driven to their boats, and proceed to the outer moss-bearing rocks, where the rake is used, as it also is during ordinary low tides. Moss taken in this way is not so clean as the hand-picked, and is always mixed with tape grass, which must be removed during the process of curing and packing.

The curing of the moss is the most critical part of this peculiar farming. On being brought to the shore, the moss is black and unsightly; it must be bleached, as well as dried. The bleaching is effected by repeated wetting and drying in the sun; and as the moss is readily soluble in fresh water, the bleaching beds are situated near the banks of the salt creeks that abound along the shore. After drying, the moss is packed in tubs and rolled to the water, where it is thoroughly washed, then rolled back to the bleaching bed, to be dried again in the sun. Five or six such exposures are usually sufficient. On the bleaching ground the moss is carefully spread and turned, and watchfully guarded against wetting by rain. In this process it turns from black to red, then to the yellowish-white of the perfected article. When properly cured, the moss is stored in bulk, in shanties, where, as time permits, it is picked over and packed in barrels. The crop averages about half a million pounds a year; and, thanks to the brighter and more abundant sunshine of our coast, the moss has a brighter colour and is of finer quality than the Irish product.

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* *Scientific American*, from the *Pharmacist* for September, 1877.

The Pharmaceutical Journal.

SATURDAY, OCTOBER 20, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal. MESSRS. CHURCHILL, *New Burlington Street, London, W.* *Envelopes indorsed "Pharm. Journ."*

STRAINING THE LAW.

THE feat of driving a coach and four through an Act of Parliament, though proverbially possible, is one more calculated to illustrate the ingenuity of the operator than to redound to his credit or to prove useful to the community, and consequently it is fortunate that we have but few instances of the kind. But the opposite performance of making the provisions of an Act a pretext for instituting prosecutions which have no sound foundation in fact, or any reasonable desirability, is unfortunately at the present time by no means uncommon. First among the offenders in this direction are public analysts, as we have already had to point out on several occasions, and it is with much regret that we find in the reports of two cases lately brought before the Glasgow magistrates, continued evidence of the same tendency to overdo the working of the Food and Drugs Act, so as to convert a provision for the protection of the public into an engine for persecuting the individual trader.

The cases we refer to were partially reported in the Journal of last week under the head of "Alleged Adulteration of Citrate of Magnesia," and the charge made against the persons accused was that they had sold citrate of magnesia which was not of the nature, substance, and quality demanded by the purchaser. The evidence by which it was sought to support this charge was to the effect that the article sold contained lead; in one case, to the extent of about one-third of a grain (0·37) in 7000 grains, in the other case, to the extent of four-tenths of a grain in the same quantity of the citrate.

It may be gathered from the reported remarks of the Stipendiary Magistrate and of the Fiscal, that the facts given in evidence as to the presence of lead in the citrate of magnesia were construed as indicating the perpetration of a gross adulteration of the article, and the committal of a reprehensible offence against the Food and Drugs Act. Under the influence of these impressions—which even led the Fiscal to consider the case where the presence of four-tenths of a grain of lead was testified to, as being one "much more gross" than that in which the alleged quantity was ·37 of a grain—the evidence given for the defence was apparently little regarded, or at most estimated only as what might be urged by a dishonest tradesman to justify or excuse his misdeeds.

This evidence for the defence was, however, very much to the point, and in our opinion it ought to have secured the immediate dismissal of both cases. The witnesses called were Mr. HOWIE and Mr. McADAM, both persons well conversant with the trade and with the nature of the article in question. Both of them stated that citric acid was well known to contain minute traces of lead as an impurity arising from the method of manufacturing it, and as citric acid is an ingredient of citrate of magnesia it was thus rendered evident that the lead contained in the citrate was not an adulteration in any sense. It had not been added fraudulently to increase the bulk, weight, or measure of the article sold as citrate of magnesia, neither had it been added to conceal the inferior quality of that article, or in any other way to prejudice the purchaser; but it was precisely one of those impurities or extraneous substances which become unavoidably mixed with articles of food and drugs in the process of preparation, and this is one of the cases in regard to which the Act very properly provides that an offence shall not be deemed to be committed.

Under these circumstances, we think that Dr. SMITH and Mr. CAMPBELL have much reason to regard themselves as sorely aggrieved by being made the objects of a prosecution so entirely without just foundation. And after having been held for a week under the suspicion of being the perpetrators of a fraudulent offence, there is but small consolation in being told that the case was "not proven," instead of being exonerated from reproach. However, that was the extent to which the magistrate went in delivering judgment, as will be seen from our report, at p. 317, while Dr. SMITH and Mr. CAMPBELL had to bear the expense of producing evidence in their behalf, as well as the inconvenience of attending at the police court.

Another case of a similar nature was heard at Barnard Castle, last week, in which Mr. COOKE, of the Commercial Inn, Galgate, was sought to be punished, under the Food and Drugs Act, for selling soda water which did not contain the full quantity of fifteen grains of bicarbonate of soda in the half-pint, as directed by the British Pharmacopœia. In this instance the absurdity of expecting an innkeeper to be governed in the sale of articles by rules laid down in the Pharmacopœia was apparent to the magistrates, and they dismissed the charge, on the ground that the soda water was sold as a beverage and not for medicinal purposes.

With every desire to aid the repression of practices of adulteration or substitution which are reasonably to be regarded as injurious to the public, we cannot but protest against the idea that the Pharmacopœia definitions should be made to apply to ordinary articles of commerce, not intended for medicinal use. In the case of impurities also, such as the presence of lead in citric acid, where the amount is so small, and, where considering the conditions under which citric acid or citrate of magnesia is used, the probability of its being injurious is so slender, we consider it is in the highest degree unfair to subject the trader to the trouble of defending a prosecution.

We are by no means unmindful that in the cases above mentioned, medical evidence was given to the effect that the lead in the citrate of magnesia might prove injurious. This however was merely an opinion, and its inconsistency with the witness's own experience was manifested by himself in cross-examination when he stated that he frequently prescribed citrate of magnesia and had neither observed any symptoms of poisoning following its use, nor heard or read of such a result. To any one cognisant of the enormous extent to which the preparation known as "citrate of magnesia" is consumed, the fact that no case is known, even of suspected injurious effect, should be sufficient to prove the absurdity of these prosecutions. They are in fact purely speculative, and being altogether outside the objects for which the Act was passed such prosecutions should never be instituted unless it shall have been previously demonstrated that a particular impurity is prejudicial. Until this is authoritatively established and due notice has been given to that effect, the trader should be exempt from the attacks of over zealous analysts and medical officers of health whose opinions are often more decided than well founded. It is time some measures were adopted for repressing in this way the acts of the analysts, which are fast tending to bring the Food and Drugs Act into ridicule, and to deprive the public of that protection which it was intended to afford.

ILLEGAL USE OF METHYLATED SPIRIT.

Our readers will have observed that this subject was recently under the consideration of the Law and Parliamentary Committee of the Council, and that some members of Council expressed the hope that no occasion might arise for vexatious interference by revenue officers, while at the same time the unfair position in which an honest tradesman might be placed by an unscrupulous neighbour was not overlooked.

We understand that complaints have been addressed to the Board of Inland Revenue, which have induced the Board to issue a specific order in reference to the use of methylated spirit, with the object of giving full publicity to the restrictions under which it is permitted. The order referred to was issued on the 16th August last, and runs as follows:—

Methylated Spirit.

Officers surveying Manufacturing Chemists who are allowed to receive methylated spirits, must immediately inform such traders, in writing, that the use of methylated spirit in the preparation of "absolute alcohol" is clearly illegal, as involving the purification of the spirit; and if after this warning it is discovered that any such process is still carried on by any person, the fact must be stated to the Board, in order that legal proceedings may be taken for the penalty incurred.

"NOTHING NEW UNDER THE SUN."

It has often been remarked, when some fact new to science has been disclosed, that the world has already had a sufficiently real, though unacknowledged and unexplained, prescience of its existence to justify the above quoted adage of the wise man. A fresh illustration of this has just occcurred. The statement of Mr. Whitfield last week (p. 300) as to the practice in some laundries of adding turpentine to the washing water, and that of Mr. Druce this week (p. 320) as to the sprinkling of some turpentine on floors before scrubbing them, only show that the washerwoman and the charwoman had so far unconsciously anticipated Mr. Kingzett's researches on the properties of the products obtained by the oxidation of turpentine which are now being applied as a disinfectant under the name of "Sanitas." Our contemporary, the *Lancet*, recently appointed one of its "Special Commissions" to report on the subject of laundries as a possible source of infection, and one result of the disclosures made in this report is the projected establishment of laundries to be conducted on strictly sanitary principles. We take the liberty of suggesting to the managers who are to be entrusted with the scientific drilling of the laundresses that in the custom above referred to their unscientific pupils *in futuro* provide them with a valuable hint as to the scientific disinfection and washing of linen.

BENEVOLENT FUND—ELECTION OF ANNUITANTS.

We take the opportunity of reminding our readers that on Wednesday next, at noon, a meeting is to be held at 17, Bloomsbury Square, for the Election of Six Annuitants on the Benevolent Fund of the Pharmaceutical Society. As there is always a considerable amount of work to be done in connection with the details of these elections, it is hoped that the Chairman will be supported by the attendance of a goodly number of the Subscribers to the Fund.

THE CHEMICAL SOCIETY.

The first meeting of the Chemical Society for the forthcoming session will be held on Thursday, November 1st, at 8. The papers to be read are: "On some Hydrocarbons obtained from the Homologues of Cinnamic Acid," W. H. Perkin, F.R.S., "On Anethol and its Homologues," W. H. Perkin; F.R.S.; "On Two New Methods of Estimating Bismuth Volumetrically," M. M. P. Muir.

LIVERPOOL CHEMISTS' ASSOCIATION.

The School of Pharmacy in connection with the Liverpool School of Pharmacy commenced its operations for the present session on Friday of the present week, with the first of a course of lectures on Chemistry, delivered by Mr. Thomas Williams, F.C.S. Arrangements are also made for the teaching of Practical Chemistry. Lectures on Materia Medica, Therapeutics, and Botany are to be delivered during the summer months. In connection with this school the President of the Association, Mr. T. Fell Abraham, offers two prizes of the value of one guinea each for the students who shall pass the best examination in Chemistry and in Botany respectively. The Honorary Secretary is Mr. Williams, Royal Institution, Colquitt Street.

Transactions of the Pharmaceutical Society.

PRELIMINARY EXAMINATION.

At a meeting of the Board of Examiners for England and Wales, held in London on Wednesday, October 17th, 1877, the Report of the College of Preceptors on the Examination held on October 1st was received.

Two hundred and thirty-two candidates had presented themselves for examination of whom *One hundred and twenty-four* had failed. The following *one hundred and eight* passed, and the Registrar was authorized to place their names upon the Register of Apprentices or Students:—

(Arranged alphabetically.)

Arthur, Samuel ....Redruth.
Baker, John Edward ....Bristol.
Ballard, Walter ....Abingdon.
Bartlett, Geo. Fredk. Handel...New Wandsworth.
Bayly, James Hodgson ... .Liverpool.
Beck, Nathan George ....Lyme-Regis.
Beeby, Robert Berry ....Coventry.
Bennett, Frank William.........London.
Bennett, John William ....Leigh.
Bernstein, Moses ....Sunderland.
Berridge, Oliver Gillett ....Leicester.
Biggam, William ....Sunderland.
Booth, Daniel ....Heage.
Brett, William George...........Grantham.
Brown, Alexander ....Dumbarton.
Burton, Edmund ....Totnes.
Clark, Harry ....London.
Cobb, George Myhill ....Nottingham.
Collier, George Patrick ....London.
Comer, Ernest Edward ....East Dereham.
Crummy, Thomas.................Douglas, I. of W.
Dan, John...........................St. Clears.
Dancy, Ralph ....Turner's Hill.
Davies, Thomas ....Hirwain.
Diamond, Harry Scott ....Pembroke Dock.
Donald, Joseph.....................Newton Arlosh.
Douglas, William.................Woodside.
Dyball, Thomas Walter ....Ipswich.
Elmitt, Samuel Frank ....Horncastle.
Farrer, Edward ....Kendal.
Field, Cornelius ....Cheshunt.
Fletcher, James Edward.........Saltley.
Fowler, Thomas Webb ....Nottingham.
Gatward, Oswald ....Hitchin.
Gray, John ....Dundee.
Grieve, Charles Frederick ......Edinburgh.
Hake, James ....Taunton.
Harburn, Alfred ....London.
Hawdon, James Alexander......London.
Haythornthwaite, William......Giggleswick.
Hedley, Robert Cecil ....Newcastle-on-Tyne.
Hewitt, Joseph........... ....York.
Hick, Thomas Matthew ....York.
Higgs, Frederic Charles ....Newbury.
Howe, John Michael W..........Hitchin.
Humphrey, John Thurlbeck ...Sunderland.
Ison, Harry John..................Wellington.
Jarvis, Joseph Henry E..........Ashford, Kent.
Jenkins, Charles Major ....Crosswen Cottage.
Johnston, David Leslie ....Forres.
Jowett, William Hall ....Blackburn.
Lamplough, Frederick Wm. ...Great Driffield.
Lees, James ....Leighton-Buzzard.
Le Sueur, Charles ....Exeter.
Lockwood, Thomas .. ..York.
Lockyer, Joseph Ernest ....Deptford.
Lyon, William Charles ....London.
McPherson, William ....Dufftown.
Maddock, Richard ....Broad Clyst.
Mann, Numa.............. ....Ilkley.
Mays, Herbert ....Wellingborough.
Melwin, James, jun. ....Aberdeen.
Mill, Percival Fenwick ....Buxton.
Miller, David ....Brechin.
Milton, William ....Aberdeen.
Molz, Hermann Adolphus ......Sheffield.
Moore, Frank ....Mirfield.
Morris, David Henry Martin...Sunbury.
Nicol, John Kininmouth.........Leslie.
Nobbs, Arthur Perkins ....Newport, I. W.
Panton, John Edward............Horncastle.
Pask, Thomas Edward ....Newark.
Pass, William Hall ....Macclesfield.
Phillips, Sidney ....Wolverhampton,
Pinder, Robert ....Bourne.
Platt, Joseph ....Stalybridge.
Pocock, William Frederick H. Cape Town.
Preston, Henry.....................Mansfield.
Pritchard, Elias Roberts ....Aberdaron.
Provis, Charles ....Emsworth.
Rann, Millichamp Leonard J. Malvern Link.
Ray, Charles...................... ..Eastbourne.
Roberts, David ....Aberystwith.
Roberts, Roderick ....Crickhowell.
Rohan, Robert Aldor ....Mauritius.
Salmon, Ernest Frederick ......London.
Scammell, Luther Robert ......Adelaide.
Seymour, George ... .London.
Seys, Frederick Arthur ....Newport (Mon.).
Shawyer, John James............Clevedon.
Sill, Silvester Arthur ....Stratford-on-Avon.
Simpson, Robert ....Alnwick.
Spratling, Walter..................Boston.
Sykes, Thomas Hindle, jun. ...Southport.
Tait, Robert ....Edinburgh.
Taylor, George ....Fairfield.
Tucker, William Thomas M. ...Exeter.
Wade, Arthur Malakhoff ......Wakefield.
Warren Evan Mays................Wellingborough.
Waters, William Allen ....Emsworth.
Waymouth, Thomas Staddon...Exeter.
Webb, George Frederick ....London.
Wigg, James.........................Streatham Common
Willett, Frank Augustine ......Oxton, Birkenhead.
Wood, John ....Leighton-Buzzard.
Worsley, Albert George ....Folkestone.
Wynne, William Palmer.........Birmingham.
Young, Thomas ....Cheddar.

The Questions for Examination were as follows:—

First or Preliminary Examination.

October 1st, 1877.

(*Time Allowed: Three hours for the three subjects.*

I. LATIN.

1. Translate into English:—Cum sæpe ultro citroque legati inter eos *mitterentur*, Ariovistus postulavit, ne quem peditem ad colloquium Cæsar *adduceret*; vereri se ne per insidias ab eo circumveniretur: uterque cum equitatu veniret: alia ratione se non esse *venturum*. Cæsar, quod neque colloquium interposita causa *tolli* volebat, neque *salutem* suam Gallorum *equitatui* committere audebat, commodissimum esse statuit, omnibus *equis* Gallis *equitibus detractis*, eo legionarios *milites* legionis decimæ, *cui* quam maxime confidebat, imponere, ut præsidium quam amicissimum, si quid opus facto esset, haberet.

2. Decline *salutem, equitatui, equis, equitibus, milites*, and *cui*.

3. Give the present, perfect, supine, and infinitive of *mitterentur, adduceret, venturum, tolli, detractis*.

4. Select the nouns and pronouns in the first sentence, "*cum—venturum*;" name the case of each, and give the reason for the case in each instance.

5. What instances of the "ablative absolute" have we in the above extract? When may this construction be used? Why is it called "absolute"?

II. ARITHMETIC.

(The working of these questions, as well as the answers, must be written out in full.)

6. (*a*) How are the unit of weight (gramme) and the unit of capacity (litre) derived from the unit of length (metre) in the Metric System? (*b*) How many English inches does the metre contain? (*c*) Without actually performing the calculation, state clearly how you can calculate the number of cubic inches in a litre.

7. What unit is common to the three English measures of weight? Find the value of 3 cwt. 3 qrs. 5 lbs. at £4 14*s.* per cwt.

8. Find the value of $\frac{15\frac{1}{2}}{16}$ of $\frac{11}{62\frac{1}{2}}$ (*a*) as a vulgar fraction, (*b*) as a decimal.

9. If 30 cwt. are carried 15 miles for £5 8*s.* 9*d.*, how far ought 80 cwt. to be carried for £29?

10. In the Centigrade thermometer the freezing point is zero, and the boiling point is 100°; in Fahrenheit's the freezing point is 32°, and the boiling point is 212°; what degree C. corresponds to 68 F.?

III. ENGLISH.

11. Distinguish (*a*) the use of the Adjective from that of the Adverb; (*b*) the use of the Preposition from that of the Conjunction.

12. Give the past, indefinite, and the complete participle of the following verbs:—*wind, show, shake, catch, freeze, throw.*

13. Give in full the future of *write*, (*a*) as a simple future, (*b*) as an emphatic future.

14. Parse the following lines:—

"Who but must laugh, if such a man there be?
Who would not weep, if Atticus were he?"

15. Write a short account of Thomas à Becket or Sir Walter Raleigh; *or* a short essay on the Electric Telegraph, *or* the War in Turkey.

The following is a list of the Centres at which the examination was held, showing the number of candidates examined at each Centre, and the result:—

	Candidates. Examined.	Passed.	Failed.		Candidates. Examined.	Passed.	Failed.
Aberdeen	7	5	2	Leeds	14	5	9
Aberystwith	2	1	1	Leicester	3	2	1
Barnstaple	1	1	0	Lincoln	2	1	1
Birmingham	12	4	8	Liverpool	4	2	2
Boston	4	3	1	London	40	19	21
Brighton	4	1	3	Macclesfield	2	1	1
Bristol	5	3	2	Manchester	11	2	9
Cambridge	2	0	2	Newcastle-on-T.	11	5	6
Canterbury	2	2	0	Northampton	6	4	2
Cardiff	4	1	3	Norwich	2	1	1
Cardigan	1	0	1	Nottingham	9	4	5
Carlisle	4	2	2	Oxford	4	1	3
Carmarthen	2	1	1	Peterborough	2	1	1
Carnarvon	2	1	1	Plymouth	1	1	0
Cheltenham	1	0	1	Portsmouth	2	2	0
Chester	2	0	2	Preston	4	3	1
Colchester	1	1	0	Reading	3	1	2
Darlington	1	0	1	Salisbury	1	0	1
Douglas	1	1	0	Scarborough	1	0	1
Dundee	2	1	1	Sheffield	3	1	2
Edinburgh	10	4	6	Shrewsbury	3	1	2
Exeter	5	4	1	Southampton	1	1	0
Glasgow	8	1	7	Swansea	6	3	3
Hereford	1	1	0	Taunton	1	1	0
Hull	2	1	1	Truro	2	1	1
Inverness	1	1	0	Worcester	1	1	0
Leamington	2	1	1	York	4	3	1

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The first general meeting of the twenty-ninth session of this Association was held at the Royal Institution, October 11, 1877.

At the opening of the meeting Mr. A. H. Mason, F.C.S., the retiring President, occupied the chair.

The minutes of the annual meeting were read and signed.

The Secretary announced the officers for the present session; President, Mr. Thomas Fell Abraham, A.A.; Vice-President, Mr. Joseph Woodcock; Hon. Treasurer, Mr. Robert Sumner; Hon. Secretary, Mr. Thomas Williams, F.C.S.

Mr. Mason in a cordial manner introduced the President, who upon taking the chair was greeted with a hearty applause. Various donations were announced to the library and museum, and votes of thanks accorded to the donors.

Messrs. W. H. Allen and T. H. Johnson, F.C.S., were unanimously elected members, and Messrs. J. Aston, H. Burrows, and R. Brown, were elected associates.

In the absence of Mr. J. T. Armstrong, F.C.S., the President exhibited the otheoscope, a new form of radiometer, and explained its construction.

Dr. Charles Symes exhibited an electric gas lighting apparatus. He said he exhibited that instrument not because it belonged either to chemistry or pharmacy, but as an interesting practical application of frictional electricity. It consists of a gas burner supported on a movable disc of ebonite, over which is fixed a metallic disc lined with leather and surmounted by two wires terminating in points (but not touching) exactly over the orifice of the jet. The electricity developed by the friction of the two plates is communicated to one of the wires by a little chain, and in passing from one point to the other produces a spark which ignites the gas. Its object is more especially to obviate the necessity for matches in works and warehouses where their use would be dangerous. He also exhibited a specimen of asbestos cardboard, which substance he said has been recently introduced as a packing for pistons, etc., of machinery, and is also an acquisition to the chemical laboratory. It was shown and described some months since by Mr. Noel Hartley at a meeting of the Chemical Society. When wetted it is quite soft and pliable, and may be bent or pressed into any form desired. As a small mat on which to place hot flasks or crucibles, or moulded round the bottom of a flask to protect it from the direct action of the flame and to diffuse the heat of a Bunsen lamp, it is equally valuable. He exhibited pieces he had worked into different shapes, and in a crucible of this material readily melted some lead before the audience.

Mr. E. Davies, F.C.S., thought it would prove highly useful for luting retorts and to prevent the bumping which occurs in certain distillations.

The President, Mr. T. Fell Abraham, A.A., delivered his inaugural address.

Inaugural Address.

Gentlemen,—When I was informed that your Society had honoured me by conferring upon me the office of President, I shrank from its acceptance.

It was pointed out, however, that such a course would be inconvenient, as, under the new laws the President is elected by the members present at the last ordinary meeting prior to the recess.

Had I so declined to act I should certainly have consulted my own comfort and, probably, also the interests of the Association, for I feel myself, both as respects my powers and my opportunities, quite incapable of doing justice to the obligations of the office which you have so honoured me by conferring.

However, having accepted the duties I must trust that you will look with indulgence on my many deficiencies, and grant me your cordial assistance in any endeavours I may put forth to conduct the business of the session to a successful conclusion.

To the members of the Council of your Association I may perhaps be permitted to make a more special appeal. Mine is the first instance in which a president has been appointed from amongst the body of the members. They have hitherto, invariably, I believe, been previously members of Council, and therefore to a greater or less degree acquainted with the internal administration of the Association.

I therefore look to the members of the Council for that kindly assistance which their experience will enable them to give me, and which my inexperience will make me so dependent upon.

With your permission, gentlemen, I will now proceed briefly to refer to some matters which have been, some to a greater and some to a lesser extent, occupying the minds of pharmacists and chemists during the last few months.

First, as to the much discussed and probably rather hackneyed subject of "counter-prescribing."

At the outset, it is necessary to remember that laws are made, or at all events should be made, not for the protection of particular classes but for the protection of the public. Thus the various Medical Acts are not intended for the benefit of medical men primarily, though really they may be so; they are intended to protect the public from the injury arising from the false pretences of unqualified persons. So with the Acts relating to pharmacy. These Acts have not been made to apply to the sale of simple drugs or other remedies. It is only when one comes to deal with dangerous substances and prescriptions that the law steps in and requires a special qualification.

Now let us try to apply these two general rules to our special case.

In the first place, what is prescribing? Some would say that prescribing for a patient is, writing what we call a prescription for him. In one, and perhaps its strictest, sense, this definition is correct. Practically, however, it is only very partially correct. A physician may prescribe change of diet, of occupation, of scene, or of clothing for his patient without writing a word. The instructions the physician gives his patient form his prescription; the writing of a portion is merely a means.

The person who administers a stimulant to another whose symptoms he thinks demand such treatment, we consider does a kind action and we would laugh at the idea of such an action being an encroachment on the duties of the physician. Similarly the chemist who gives a dose of chalk mixture to a person who complains of diarrhœa, an antacid draught to one who feels sickly, or applies plaster to the wound of a person knocked down by a passing vehicle, does not step beyond the reasonable bounds of his calling. But when a chemist undertakes to give advice in serious or complicated cases he does, unless the circumstances are very exceptional, what is unjustifiable, because he does, or rather, professes to do, that which in ninety-nine cases out of a hundred his education and training have not qualified him to perform, and for which another portion of the community, specially educated for the purpose, is so qualified.

On the other hand the public often overrate our ability to advise them, and it is very difficult to refuse compliance with requests which to them seem no more than reasonable.

Let those of us then who are pharmacists, whilst firmly declining to undertake responsibilities which we are not qualified to fulfil, be equally determined to defend ourselves from enactments, if they should be proposed, which would render it almost impossible for us to carry on our business.

The fact that a large proportion of our members, myself amongst the number, are pharmacists, must be my excuse for troubling you with a few words on two matters which are probably of but little interest to those outside our ranks.

First as to the Patent Medicine Duty.

How or when it came originally to be imposed I have been unable to ascertain, and it is probably of but little import to inquire.

The use of the word "patent" is in the first place absurd. A moment's consideration will show this. The word means—open, subject to inspection, free from concealment. Now it is to just such preparations as fulfil these conditions that the so-called "Patent Medicine" duty does not apply. The element of concealment of composition is invariably present in the case of those medicines which the public and the Inland Revenue department call "patent." Can anything be more paradoxical?

But a much more serious matter is that the public, utterly ignorant as nine-tenths of them are as to the law on such matters, have got a sort of hazy notion into their heads that because a thing bears a government stamp it has therefore received some sort of official sanction and may safely be administered. They do not know that anything, be it as mild as ditchwater or as deadly as aconite, is equally eligible for the dignity conferred by a government stamp.

In the third place, the duty is inequitable and almost prohibitory in the case of imported articles. For example, a preparation is intended to sell in France at $4\frac{1}{2}$ francs; add the various charges, and we might sell it for *4s. 6d.* If, however, there be any paper or label about it that brings it within the clutches of the Medicine Duty, the price is forthwith pushed up to *5s. 6d.* by the *1s.* stamp., an addition of 22 per cent. to its cost. Of course in many cases such an addition is prohibitory.

The objections which I have urged are those which most naturally present themselves to the pharmacist. The student of political economy would of course condemn the tax for reasons of a totally different nature, to which I need not refer. I would, therefore, most respectfully urge on your consideration whether the time has not come when a movement should be made in the direction of obtaining either the remodelling, or better still, the abolition of the tax to which I have referred.

One more matter, interesting to us exclusively as retailers of drugs. A chemist has recently been mulcted in a nominal amount for selling as castor oil pills, pills which did not depend for their activity on castor oil.

In his defence, it may be said that he was asked for an impossibility, that he gave what many chemists would have given under similar circumstances, and that his customer was not in any way defrauded or injured at his hands.

On the other side it may be urged that his customer did not, and possibly, could not, be expected to know that pills which depend for their activity on castor oil are not available, that it was the chemist's duty to explain that to him, and not to let him go away with an idea that he was taking medicine the action of which would be due to castor oil, or to that principally, when its active ingredients were various purgatives, doubtless very good in their way, but totally different in their nature and properties from the article named.

The sooner such shams as citrate of magnesia without magnesia, castor oil pills without castor oil, elixir of horehound which contains no horehound, extracts of linseed in which linseed is the least important ingredient, and many others which might be named, are become things of the past the better will it be, both for the public and for the trade or profession to which we belong. Let us encourage truth and despise falsehood, whether it be in name or any other form.

But to pass on. The past six months have not been particularly fertile in pharmaceutical novelties, or, perhaps

I should say, in novelties that have proved themselves of practical use.

Hydrobromic acid, or rather the impure solution thereof as produced by the process described by Dr. Fothergill, seems to have firmly established itself as a useful agent in combination with quinine. It is found that in many cases when the use of quinine causes headache or other disagreeable symptoms the addition of fifteen or twenty minim doses of hydrobromic acid entirely removes the difficulty. Whether its administration as an independent remedy will be found desirable I think still remains to be seen.

It must be, however, a matter of regret that the name should have come in pharmacy to be applied to an impure and somewhat indefinite product. It is to be hoped that in our next appendix to the Pharmacopœia a form will be introduced that, while keeping pretty closely to the strength of Fothergill's acid, which I think has been found convenient, will furnish a fairly pure and definite product.

Speaking of definiteness, I trust I may be excused for remarking that little can be done in the way of securing greater accuracy in the administration of medicines until the present practice of ordering drops, teaspoonfuls, and tablespoonfuls is abandoned in favour of that of ordering minims, drachms, and ounces. The prescriber calculates to a nicety the quantity of a drug he wishes to give; the druggist conscientiously prepares the medicine, using the most approved appliances to ensure accuracy, and then the patient completely defeats his doctor's intentions by using as a measure a vessel which may be inaccurate to the extent of 50, 60, or even 100 per cent.

Nor is the difficulty confined to spoon measures. What is meant by—say twenty measured drops? It is not very easy to tell. Some would say at once that "twenty measured drops" meant twenty minims, and probably generally that is meant; but, on the other hand, some would say that "twenty measured drops" were twenty counted drops, which in many cases would represent less than half twenty minims, while the Board of Trade would define twenty measured drops as equal to half a fluid drachm, which, in the case of many liquids, as laudanum, chloroform, and some essential oils and tinctures, would make not less than fifty or sixty actual drops.

Chemists can do but little towards bringing about a change for the better in this respect. Till the use of definite terms becomes usual, and the public has been taught to know their meaning and the importance of accuracy in the matter, we must be content as occasion offers to point out the undesirability of continuing the present system. One of the principal difficulties in the way of a reform has recently been overcome by the introduction of the very portable and most inexpensive medicine measures of Mr. Proctor and also of Messrs. Mawson and Swan.

Indian hemp has recently been examined by Dr. Preobraschensky, a Russian, with the result that he attributes its activity to the presence of nicotine. Whether this is the truth or only a portion of the truth remains to be seen.

The low price at which a pure glycerine can now be obtained is having the effect of encouraging the introduction of several new glyceroles. Amongst them may be named those of subacetate of lead, nitrate of bismuth, salicin, salicin and pepsine, pepsine, castor oil, rhatany, and tar. Whether any of these, except the first two, will be found to be really valuable additions to our already too extensive list of pharmaceutical preparations is, I think, very doubtful.

The scarcity of the cinchona bark and consequent high price of its preparations, more especially of quinine, have been fruitful sources of annoyance to pharmacists. Mr. Howard's paper, read at the Pharmaceutical Conference, held out but little hope of a speedy return to normal prices, notwithstanding the extended cultivation of the cinchonas in different parts of the east. It is, to my mind, a matter much to be regretted that so little attention is given by prescribers to the cinchona alkaloids other than quinine, some of which are pretty clearly shown to produce excellent results. If their value was more fully recognized by the medical profession many persons who are now deprived of the use of quinine by its high price would gladly use them. The more extensive use of these alkaloids would also have an excellent effect in reducing the price of quinine and thus leaving it available for use in the special cases where experience may show that it stands pre-eminent.

Much has lately been said with reference to the best means to be adopted to prevent, as far as possible, accidents with chloral hydrate. Its position as a valuable sedative is so fully established that any regulations that would interfere with its use will not be tolerated either by the profession or the public. It has been suggested that it should only be supplied on the order of a medical man, but such a regulation would not have prevented the accidents that have occurred, because it is unreasonable to expect that the patient must get an order for each individual dose of the remedy and the accidents that have arisen have occurred to persons for whom the chloral had been ordered by their medical adviser, but who, not finding a first dose produce the desired effect, have had recourse to a second or a third. So long as a poison such as chloral stands at the head, or nearly at the head of our list of available sedatives, so long must mishaps of a more or less serious nature occur from its use or rather abuse. Regulations as to registration are all very well in their way, but it is my conviction that no good would arise from their application to a substance of such extensive use and so wide a range of dose as chloral hydrate. On the contrary, such regulations would deter some persons from using it, who might fairly and with benefit do so, and would tend to make the public look with less dread, if I may use the term, on those dangerous substances now included in Schedule A of the Poison Act.

The cry for stringent regulations, which simply means in many cases prohibition, seems to my mind nearly akin to that which would prohibit the sale of alcoholic drinks because some persons indulge in their use to an excess, or would close our parks on Sunday because some few persons misbehave themselves, or would abolish theatres because occasionally performances of a degrading character are given therein.

Mr. H. Greenish has recently drawn attention to the fact that commercial oxalate of cerium is sometimes largely contaminated with the oxalate of lanthanum and didymium derived from the mineral from which it is always prepared. He has also shown that the proportions of cerium, lanthanum, and didymium, vary largely in different samples. To so great an extent is this the case and so difficult is it to prepare a perfectly pure salt that a suspicion arises as to whether the good effects attributed by some writers to oxalate of barium may not really be due to the oxalate of lanthamum or to didymium. The very widely varying opinion as to its value as a remedy entertained by different practitioners may probably be traceable to the facts thus pointed out by Mr. Greenish, who states that the Pharmacopœia test of purity would not exclude the presence of the two metals named.

Amongst new drugs may be named Coto bark, said to be a good remedy and indeed a specific for diarrhœa. It is found to contain a volatile aromatic oil, a volatile alkaloid with an odour like propylamine, a soft resin, soluble in alcohol, ether, chloroform, and sparingly in benzole, precipitated by alkalies; a hard resin also soluble in alcohol, insoluble in ether and chloroform, and of five crystallizable bodies to which the names cotoin, paracotoin, leucotin, oxyleucotin, and hydrocotoin, have been given. Coto may be administered as powder, or in the form of an alcoholic 10 per cent. tincture.

Salicylic acid, of which such great expectations prevailed, seems to make but slow progress. This is probably in great measure due to the fact that it is so sparingly soluble in water. This difficulty is readily overcome by the addition of either borax, solution of citrate of ammonia, or of acetate of ammonia. A contribution to the American Pharmaceutical Conference proposes as a convenient and inexpensive method of purifying the commercial pinkish coloured acid its solution in glycerine and subsequent precipitation therefrom by the addition of water.

Attempts have been made to substitute the salicylates of soda and ammonia, which are freely soluble in water, for the acid itself, but these attempts have not met with success, it being pretty clearly shown that the salicylates do not possess the properties of salicylic acid. Probably, as often is the case with new remedies, its value was at first considerably over estimated, and it is now suffering from the consequent revulsion of feeling which overtakes many medicines until their proper application has been correctly ascertained.

Lactopeptin, of which a good deal has recently been heard, has been carefully examined by Mr. E. Scheffer. From his reports, presented to the American Pharmaceutical Conference, it would appear that the statements as to its composition and powers, set forth so boldly on its labels and circulars, are not borne out by facts. It professes to consist of a mixture of pepsine, pancreatine, diastase, hydrochloric and lactic acids, with sugar of milk as a diluent. The conclusions arrived at by the writer of the paper are that lactopeptin contains pepsine, but that its activity is very inferior to that stated; that the pancreatine and pepsine being incompatibles the former is destroyed, and that diastase and hydrochloric acid are also incompatibles; the diastase, if originally present, is destroyed. These results are, as far as I have had opportunities of comparison, confirmed by my own experiments. I found that my sample did not dissolve the quantity of albumen stated, nor one-fourth of it; did not convert the starch into glucose, and that fifteen grains did not emulsify four ounces of cod liver oil.

Calabar bean has been the subject of fresh investigations by Messrs. Harnack and Witkowsky, at Strassburg, with the result of isolating a new alkaloid, to which the name Harnack's calabarin has been given. It differs from eserine, or physostigmine, as it is proposed to rename it, in that it is insoluble in ether and more readily soluble in water.

The discordant effects noted by different experimenters with the preparations of calabar bean are ascribed to the fact that those preparations contain, in varying proportions, these two alkaloids, which are in their action totally different the one from the other.

The Pharmaceutical Society of Paris has recently adopted a large number of new processes and formulæ. Amongst the most important may be mentioned those for syrup of lactophosphate of lime; infusion, wine, elixir, extract and syrup of coca; the corresponding preparations of eucalyptus globulus and of jaborandi; bromide of iron, in solution and pills; dialysed iron, syrup of pyrophosphate of iron and soda, diastase, eserine and its salts, tar water and syrup, extract of malt, mustard paper, pancreatine, syrup of bromide of potassium and phosphide of zinc.

Messrs. Dragendorff and Podwissotzky, as the result of long continued researches, assume that sclerotic acid is the active principle of ergot and that excellent effects have followed its administration. Whether its use will in time displace that of Bonjean's ergotine which has been found so efficient and convenient in practice remains to be seen.

I have now in conclusion to beg your forgiveness if the matters to which I have so very briefly referred have been of an almost exclusively pharmaceutical bearing, and to express a hope that the session on which we are now entering may not be inferior in interest to any of its predecessors.

Mr. John Shaw said he had listened with pleasure to the interesting and practical address which had just been delivered. He reminded the audience that the father of their new President was one of the founders of the Association, nearly thirty years ago, and had been actively engaged ever since in promoting its objects, and he trusted that the son would follow in his respected father's footsteps for many years to come. The address contained many topics of especial interest to chemists and druggists at the present time. The question of prescribing by chemists, or rather of counter practice, as he preferred to designate it, had yet to be settled, if such could be done by administrative or legislative authority. In times past, the fact of a person leaving his shop to visit people at their own homes was considered almost a necessary element in all cases of action against chemists and druggists for infringement of the Apothecaries Act; not so now, however, for the recommendation of any remedy in very simple ailments was in the opinion of some persons quite sufficient to establish the charge, and should such an opinion be endorsed and carried out by the authorities, he thought that much inconvenience would be experienced by the general public. With reference to the so-called patent medicines they were specially exempted from the operation of the Pharmacy Act and it did seem an extraordinary anomaly that the most stringent regulations should be placed upon the sale of poisons, and yet their distribution broadcast be permitted under cover of a three-halfpenny medicine stamp. The immense interest involved in the sale of this class of remedies was such as to necessitate the most careful consideration. The revenue to the Government derived from medicine stamps alone, realizing upwards of £117,000 per annum, was some indication of the amount of money passing across the counter in connection with that department of their business. Allusion had been made as to the propriety or otherwise of placing chloral hydrate on schedule A of the Pharmacy Act. Opinions vary much on this question. However, this matter was still under the consideration of the Council of the Pharmaceutical Society, with whom the initiative rests. The parties most anxious to have it included amongst the scheduled poisons were certain coroners and medical practitioners, as well as the medical press. Whilst speaking of chloral hydrate he could not help calling attention to the deaths caused by carbolic acid. For some years past he had taken note of the fatalities arising from that powerful and deadly poison, so far as he had noticed them in the public prints and journals, and found the number to be seventy. Twenty of these were caused by drinking the acid in mistake, instead of spirits, beer, wine, or water, etc. Twenty in mistake for medicine (eleven of these being in hospitals and other public institutions). Eighteen by suicide, and the rest from a variety of causes. Accidents have arisen in several cases from ignorance of the powerful character of the poison; mothers, in some instances, giving bottles containing the acid to their children to play with. It was extensively used as a disinfectant, and the question would be, "Is the number of deaths produced by it of sufficient urgency to necessitate legislative restrictions as to its sale?" With these few remarks he begged to propose that the best thanks of the meeting be presented to the President for his address.

Dr. Symes said that whilst fully appreciating the value of a poison schedule in the Pharmacy Act he felt it his duty, in reply to the last speaker (Mr. Shaw), to protest against its undue enlargement. Many powerful poisons are at present excluded from it for the sake of public convenience,—the strong mineral acids, to wit,—and yet public convenience does not seem to receive one moment's consideration with regard to chloral hydrate, a substance comparatively innocent, concerning which we have eminent medical testimony, based on experiment, that two drachms can be taken in twenty-four hours by a person of ordinary constitution without its acting as a poison. To his mind the proposition to place this in the same category as prussic acid, strychnine, and such potent substances, amounts to an absurdity. With regard to carbolic acid a larger number of accidental deaths have occurred through its being taken by mistake; these have usually arisen from its not being kept in proper poison bottles, but he might safely assert that not a single case of poisoning by chloral hydrate, and few, if any, by carbolic acid, would have been prevented had these articles been a part of the Poison Schedule. He had great pleasure in seconding the vote of thanks to the President for his address.

The motion was supported by Mr. Davies, and being put to the meeting by the Vice-President, was carried by acclamation.

The President announced that at the next meeting, which will be held Oct. 25, Mr. Edward Davies, F.C.S., will read a paper on "The Influence of the Nascent State on Chemical Action," illustrated with experiments.

BLACKBURN CHEMISTS AND DRUGGISTS' ASSOCIATION.

The second annual meeting of this Association was held in the rooms, Church Street, on the evening of Wednesday, October 10. Mr. W. Farnworth, President, in the chair.

After reading a statement of the current accounts for the past year, which showed a small surplus in the hands of the Treasurer, the President remarked that this was a fitting opportunity to take a retrospective view of their doings and progress for the short time they, as an association of chemists and druggists, had been in existence. The first question arising, how comes this Association to be in existence? It appears to have originated in the first instance from an anxious desire by the assistants and apprentices to secure the assistance of such an association in the prosecution of their studies, so as to enable them to meet with credit the demands that will, in the future, be required from them. No institution could have a more worthy birth, and he hoped its progress would be prosperous, and that it would render great service to its members. Shortly after the formation of the Association, it was hinted that some of the wholesale houses would be pleased to contribute to its funds, and aid in the formation of a library, etc. The suggestion was acted upon, and several of the wholesale firms being communicated with, the following handsome contributions were received:—

	£	s.	d.
Messrs. Woolley, Sons and Co., Manchester	5	5	0
Mr. James F. Wilkinson, Manchester	1	1	0
Messrs. Hodgkinsons, Stead and Treacher, London	2	2	0
,, Barron, Harveys, London	2	2	0
,, F. Newbery and Sons, London	1	1	0
,, Clarke, Bleasdale, Bell and Tollinson, York ..	2	2	0
,, Maw, Son and Thompson, London	1	1	0
,, Langton, Harker and Stagg, London	2	2	0
,, Bourne and Taylor, London	1	1	0
Mr. Gibson, Manchester	2	2	0
Messrs. Ayrton and Saunders, Liverpool	1	1	0
,, Southall, Brothers and Barclay, Birmingham, a Cabinet of Specimens of Organic Materia Medica—value	1	10	0
Messrs. Evans, Sons and Co., Liverpool, a Cabinet of Specimens of Organic Materia Medica and Pharmacopœial Preparations	7	7	0
Messrs. Hirst, Brooke and Hirst, Leeds—vols. 1 and 2 of Miller's 'Chemistry,' with promise of vol. 3, as soon as attainable.			

These were all presented with much cordiality, and best wishes for the success of the Association.

In regard to the educational arrangements, many of the younger members were attending the science classes, presided over by Mr. Isherwood, and it was in anticipation to form a class for botany at a later period. He concluded by saying that the opportunity must not be allowed to pass without an expression of thanks to Mr. Whewell, F.C.S., for three gratuitous lectures during the last session.

This Association now numbers twenty members, nineteen associates, and three honorary members.

MANCHESTER CHEMISTS' ASSOCIATION AND SCHOOL OF PHARMACY.

The ninth annual meeting of this Association was held at the Memorial Hall, Albert Square, on Wednesday evening, October 10, Mr. Councillor Brown, President, in the chair.

The minutes of the previous meeting were read and confirmed.

The senior honorary secretary, Mr. Benger, then read the following report of the Council, and the treasurer, Mr. G. S. Woolley, the statement of accounts.

"Your Committee have but few matters of interest to lay before the members in this their ninth annual report. In the absence of any threatening or very exciting attempts at pharmaceutical legislation many members of the trade in this district appear to be indifferent to any attempts which are made to provide opportunities for useful and pleasant intercourse with each other, and the efforts which have for some years past been directed towards this end by the executive of your Association, have, they regret to say, been met by much discouragement. A large proportion of those who willingly pay their annual subscriptions never attend the meetings of the Association; under such circumstances the difficulty experienced in finding gentlemen willing to read 'to a beggarly array of empty benches' papers which have cost them much time and thought can be well understood.

"During the past session the meetings were held in the Memorial Hall, tea being provided. It is proposed to continue this arrangement, and to devote one or two evenings during the year to the discussion of trade questions, which it is hoped may have the effect of bringing together some who have hitherto taken no interest in our proceedings.

"An encouraging item in the year's work has been the success which has attended the School of Pharmacy in connection with the Association. It is gratifying to note that, as was anticipated at the last annual meeting, it has not been found necessary to apply to the Pharmaceutical Society for a grant of money to supplement the fees paid by students as remuneration to the lecturers. At the termination of the session in May, Mr. Siebold and Mr. Grindon presented their reports; these, with the list of questions set in the examination for prizes, were published in the *Pharmaceutical Journal*.

"Courses of lectures for the session 1877-8 have already commenced. The attendance is, as yet, smaller than last year. . .

"It is proposed, subject to the approval of the present meeting, to alter the existing regulations respecting the issue of books from the library of the Association. Many members and associates find it inconvenient or impossible to make use of the library at the hours during which it can be kept open, and a gentleman having kindly consented to act as honorary librarian it is intended to give out the books once a week, on Thursday evenings, from 7 to 8·30 p.m., under certain conditions, such as being returned or exchanged within definite and stated times, etc. Some standard works of reference will of course be retained in our rooms, where they may be consulted at any time on application to the secretaries. It is believed this course will render the existing library more widely useful and perhaps induce members to contribute either donations of books, or of money, to our special library fund. Some much needed additions may then be made to our shelves.

"In the general account there is still a balance due to the treasurer, but as some of the subscriptions due have not yet been received it is hoped that another year will put the balance on the right side.

"At the meeting of the British Pharmaceutical Conference, held in Plymouth, Messrs. Benger and Siebold attended as delegates from this Association.

"In conclusion, your Committee would again urge the chemists of this district to assist them in maintaining the Association in an active and healthy condition, and to show by their presence at the winter meetings that they believe in the importance of the educational and other aims which the Association was established to promote.

Statement of Accounts.

		£	s.	d.
1876-7.				
Oct.	To Cash from 73 Members	36	10	0
,,	To Cash from 39 Associates	4	17	6
,,	To Cash Donation	0	10	0
,,	To Cash for Price Lists	2	10	0
,,	To Cash for Lecture Fees	91	10	0
,,	To Balance due to Bank	2	2	5
,,	To Balance due to Treasurer	15	17	2
		£153	17	1

		£	s.	d.
1876-7.				
Oct.	By Amount due to Bank	2	2	5
,,	By Amount due to Treasurer	19	2	7
,,	By Cash to Mr. Siebold (Lecture Fees)	91	10	0
,,	By Cash, Rent	22	12	6
,,	By Cash to Attendant	0	12	6
,,	By Cash, Advertising, Stationery, and Postage	7	17	4
,,	By Cash, Memorial Hall Meetings	7	6	6
,	By Cash, Sundries	0	6	3
,,	By Cash, Books for Prizes	2	7	0
		£153	17	1

		£	s.	d.
1877.				
Oct. 10.	By Balance due to Bank	£ 2	2	5
,,	By Balance due to Treasurer	15	7	2

Library Fund.

		£	s.	d.
1876-7.				
	To Balance in Bank	6	5	8
	To Cash from Assistants' Association	4	10	5
		£10	16	1
1877.				
Oct. 10.	To Balance in Bank	£3	5	8
,,	To Balance in Treasurer's hands	4	10	5

		£	s.	d.
1877.				
Oct. 10.	By Balance	10	16	1
		£10	[illegible]	1

Audited and found correct.

C. A. Johnson,
S. Paine.

The Chairman, in moving the adoption of the report and Treasurer's statement, commented on the want of interest in the Association shown by the bulk of the trade in Manchester. It was disappointing to find that in such an important district there should be a gradual falling off, instead of a steady growth in the number of those who took an active part in the affairs of this Society. It had been a reasonable hope that after nine years' work there would have been younger men coming forward willing to relieve those who had established the Association of some of the official duties connected with it. He was glad to see around him the same faces he had met for so many years, and a few new ones also. Perhaps the present gathering was as fairly representative as any of their annual meetings had been for some time; still it was far from what it ought to be. The Manchester Association had enjoyed the reputation of being one of the largest and most active in the country, and it had done in past years important service to the trade. It was gratifying to notice the continued success of their school of pharmacy. This success was largely owing to the excellence of Mr. Siebold's teaching, and as in few towns was such a teacher available, the possession of so good a school ought to induce large numbers to join the Association by whose efforts and agency the arrangements were effected, and under whose supervision they were sustained. It would be grievous if the Association were to break down simply because there were no burning questions affecting their trade interests to be discussed, when otherwise some good was being effected. He did not think the report spoke too strongly of this general apathy.

Mr. Robinson alluded to the unwillingness to subscribe which he had frequently met with in his district, even amongst old members of the Association, who "did not see what good they got from it," forgetting that they shared in the general advancement of education as well as business interests.

Mr. Benger said he feared that many who subscribed to the Association regarded the payment as a sort of investment which might in some mysterious way benefit themselves, and, being only a small sum, they did not trouble themselves to look after the way in which it was applied; such men would of course be disappointed in their return, and some would cease to invest. There was a common impression abroad that the subjects discussed at the monthly meetings were not practical, and were therefore useless. Anyone who would read Mr. Southall's excellent address to the students, at the opening of the School of Pharmacy, Bloomsbury Square, might learn what delights a little wider scientific culture than is *necessary* to the chemist and druggist can confer; and how much nobler is he who can deliver such an address, or even fully and intelligently follow it, than one who devotes his whole time and energy to mastering that somewhat difficult, though popularly considered elementary, acquirement of the chemist, how to make $11\frac{1}{2}d.$ profit in the shilling. With a reasonable prospect of an audience, there were plenty of men in Manchester—or, if not, they could be imported from elsewhere—who would bring before them some of the results of modern scientific thought. Their library might soon become a great common stock of knowledge, available for all. Their school of pharmacy might be still further developed, and their Association might be a strong and compact body, capable of exerting powerful influences under circumstances which were not altogether beyond the imagination of the chemist and druggist to conceive. He was as willing as he had been any time during the past ten years to devote time and trouble to the Association, if in doing so he could be of any real service to the trade in Manchester and district.

Mr. Bloor proposed, and Mr. George Wilkinson seconded, the re-election of the following gentlemen, as officers for the year 1877–8:—

President, Mr. W. Scott Brown; Vice-Presidents, Mr. J. T. Slugg, F.R.A.S., and Mr. W. Wilkinson; Treasurer, Mr. George S. Woolley; Hon. Secretaries, Mr. F. Baden Benger, F.C.S., and Mr. Hermann Woolley; other members of the Council, Messrs. Barnaby, Blain, Botham, Fisher, Hargraves, Hughes, Kay, Mumbray, Payne, Robinson, and Slack.

It was then proposed by Mr. Benger, seconded by Mr. Hughes, and unanimously resolved, that Mr. T. Swindells be appointed honorary librarian, and that the books be lent to members and associates, as suggested in the annual report.

Arrangements for the winter meetings were then discussed, Messrs. G. S. Woolley, Siebold, Payne, W. Wilkinson, and others taking part.

Proceedings of Scientific Societies.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The following *résumé* of the proceedings of the Association at its recent meeting is abstracted from the *Druggists' Circular*:—

The twenty-fifth annual meeeting of the American Pharmaceutical Association was held in the City of Toronto, Ontario, September 4, 5, 6, and 7.

The first session was called to order by the President, Mr. Charles Bullock, of Philadelphia, on Tuesday afternoon, 4th ult., at 3.45 p.m. By that hour some sixty or more members had registered their names as present, and the majority of delegates from the various colleges and other organizations had arrived.

The meetings were held in the City Council Chamber, which had, by a unanimous vote of the City Council, been granted for this purpose. In the absence of His Honour the Mayor, Alderman Wright, in the name of the Mayor and City Council, extended a hearty greeting to the officers and members of the Association, to which the President returned thanks on behalf of the Association.

The President, in his annual address, reminded the audience that, although the Association was composed mainly of pharmaceutists of the United States, yet it was now "at home" in Her Most Gracious Majesty's dominions, and that the occasion should be one of interest to both visitors and visited. The major portion of the address was an historical sketch of pharmacy.

The address elicited warm applause, and subsequently was referred to a committee consisting of Dr. E. P. Nichols, Newark, N.J.; John Ingalls, Macon, Ga.; and T. J. Casper, Springfield, O.

Invitations were received to visit the Bank of Toronto, and from Messrs. Gooderham and Worts to visit their distillery, which were accepted with thanks. Invitations were extended to the professors of the Toronto University and the Medical Faculty of the city to take seats with the Association during their sessions.

The Committee on Credentials reported upon the credentials received, accrediting delegates to the Association.

The Local Committee from the meeting of 1876, in Philadelphia, presented a report stating that, after the expenses incurred by their committee last year were all paid, there still remained in their hands an unexpended balance of 525 dollars; and after consultation with the donors they had decided to present this amount to the American Pharmaceutical Association, with the following proviso: that a similar sum or larger should be raised by the Association, that it be securely invested, that the revenue arising from this fund be used for defraying the expenses of members in making original investigations for the Association, and that it be called the "Centennial Fund."

The report was accepted, and on motion was referred to a committee. It was subsequently approved of, and during the later sessions the Treasurer received subscriptions from members present towards that object.

Mr. Geo. W. Kennedy read the report of the Executive Committee. This report recited the work accomplished in preparing and issuing the last volume of Proceedings, gave information as to membership, revenue, and expenses, and concluded with obituary notices of twelve members deceased during the year. It stated that the present membership is 1164, and the revenue of the Association is also adequate to meet its annual expenses, leaving no accumulation of funds; and suggested that some method should be devised for increased revenues.

The various organizations present were each requested to name one person to act on the committee to nominate officers for the ensuing year.

The reports of the various committees were read by title, and the Permanent Secretary read in full his report as to duties performed during the year, and it, with the report of the Executive Committee, was referred to a committee.

The meeting then adjourned to Wednesday morning at 9 o'clock.

WEDNESDAY MORNING—SECOND SESSION.

Soon after 9, the meeting was called to order; after the reading of the minutes of the previous meeting, and their approval, the report of the Nominating Committee was called for. The report was accepted, and on motion the nominees were balloted for, the Secretary, by direction of the Association, depositing an affirmative ballot for the several nominees separately. The principal officers thus chosen were:—President, William Saunders, London, Ontario; First Vice-President, Ewen McIntyre, New York; Second Vice-President, John Ingalls, Macon, Ga.; Third Vice-President, Emlen Painter, San Francisco; Treasurer, Charles A. Tufts, Dover, N.H.; Permanent Secretary, John M. Maisch, Philadelphia; Reporter on Progress of Pharmacy, C. Lewis Diehl, Louisville, Kentucky.

Mr. William Saunders was now presented, and by the retiring President was introduced to the Association and to the duties of the presidental chair.

The Treasurer, Dr. C. A. Tufts, then read the report of the finances of the Association for the past year, which may be briefly summarized as follows:—

	Dollars.
Balance on hand at last report . . .	941 33
Receipts for the year	5573 04
	6514 37
Expenses and disbursements for the year	5559 98
Balance in treasury	954 39

The report was accepted, and referred to auditors. At a subsequent session they reported the accounts of the Treasurer correct. They also recommended an increase of 100 dollars to the salary of the Treasurer.

Professor C. Lewis Diehl read the introduction to his report on the "Progress of Pharmacy."

The report of the Committee on Legislation was next read by Professor Maisch. From this we glean the following facts:

In Kentucky the law requires an examination after three years, and assistants must be sober and of good character. The fee for examination is ten dollars. Any one can own a registered pharmacy, but only one who has passed the examination can use the title. Graduates of medicine are exempt from the regulations of the law. Patent medicines can only be retailed by regular pharmaceutists.

In Maine the State is to be placed under the charge of three commissioners, to be appointed by the Governor. The candidates for examination must be graduates of colleges of pharmacy, or at least three years in the business, before they can be examined.

In New Jersey a law has been passed, after a struggle of seven years, and the examiners were appointed by the Governor.

In Nova Scotia a pharmacy act has been recently inaugurated.

The Committee on Adulterations and Sophistications presented a report.

In the afternoon session an amendment of the by-laws: "A motion to expel a member shall be laid over to the next session succeeding that at which the motion is made,"—was adopted by a three-fourths vote.

The discussion and vote on place of meeting then occurred, which resulted in the selection of Atlanta, Ga., on the first Tuesday in September, 1878, at 3 o'clock.

The greater part of the afternoon was occupied by the reading of replies to queries and discussions.

THURSDAY—MORNING SESSION.

The Association met at 9.15 a m., and, after the opening routine of business, the reading of replies to queries was resumed.

President Saunders then read the report of the Committee on the Drug Market, of which, during the preceding year, he was chairman. The report was of interest, especially as showing some contrasts between English and American goods to the Canadian market, and also giving much information as to the Canadian products used in pharmacy and the arts.

The Business Committee then called up the unfinished business of last year arising out of the discussions and resolutions relative to the proposition of the revision of the U. S. Pharmacopœia by the joint action of the American Medical Association and the American Pharmaceutical Association. In response to this, Dr. E. R. Squibb stated that, in the present condition of the matter, it needed no action. The American Medical

Association had decided that they would not take up the matter, therefore it would be impossible under the resolutions offered last year for this body to proceed further. For his part, after the ignominious manner in which he had been treated, he had no desire to further pursue the matter. His entire object had been only with the intention of securing a better work, and in accord with the advance of science, but he had been misunderstood, and pursued as if he had been guilty of some flagrant wrong. If the medical profession were satisfied with the work as it exists, he was willing that it should be so, and he therefore moved that the whole matter be dropped.

A resolution conveying the thanks of the Association to Dr. E. R. Squibb, of Brooklyn, New York, for his efforts during the past two or three years to inaugurate an improvement in the plan of revision of the United States Pharmacopœia, was carried unanimously.

Dr. F. Hoffman then offered the following preamble and resolutions :—

Whereas, The plan and method adapted for the elaboration of the first edition of the United States Pharmacopœia, and subsequently continued for its decennial revisions, in consequence of the improved means of intercourse, and, moreover, by the altered conditions, resources and requirements of the arts, sciences and practice of medicine and pharmacy, require a reform ; and

Whereas, The Pharmaceutical Convention, as yet the only authorized body for revising and publishing the Pharmacopœia, is so constituted that it meets for this purpose only once in ten years, and has not acted in time, notwithstanding the recognized necessity for an earlier revision, to make the Pharmacopœia conform with the progress and present status of materia medica and the practice of pharmacy; and

Whereas, The American Medical Association, after a full and elaborate presentation of this subject and of a mature plan for action, at its recent meeting in Chicago, has failed to take any action in the important subject of pharmacopœial revision; therefore

Resolved, That the President of this Association appoint a committee of five to take into consideration the advisability and feasibility on the part of the American Pharmaceutical Association, as the national representative organization of the profession of pharmacy, to prepare a complete Pharmacopœia, which may be submitted to the criticism of the medical and pharmaceutical professions, and may be proposed to the final Committee on Revision ; and that that Committee be instructed to report early at the next session, so as to leave time for definite action at this meeting.

The preamble as first proposed was the cause of some discussion by several members, and was modified as above. After some further remarks it was adopted unanimously, and the President appointed a Committee on the resolution.

Some volunteer papers were next read.

In the afternoon session, after the opening business, the Business Committee brought forward the alteration of the by-laws necessary to meet the recommendations relative to the Treasurer's salary, and it was so altered as to make his salary 500 dollars per annum, when it was adopted.

During the afternoon a volunteer paper and replies to queries were read.

The Permanent Committee on the U. S. Pharmacopœia being called upon to report, the chairman, Professor B. W. Bedford, stated that he regretted that he had no satisfactory report to present as to the action of the Committee. Some of its members had done considerable work toward the common cause, but as the body is constituted, with its members at entirely separate localities, and with no place of reunion save at the annual meetings of the body, and where it has been impossible to meet as a whole Committee, he had found great difficulties to overcome, and felt convinced after his efforts that the Committee would fail to accomplish the work as they desired. In view of these facts, and in order to leave the Association free to act in the matter of arranging a more comprehensive plan, and with the entire concurrence of the members of that Committee who were present, he tendered the resignation of the Committee.

The resignation of the Committee was accepted, and the thanks of the Association were tendered to the Committee for the labours they had performed.

The Business Committee then called upon the Committee on Dr. Hoffman's resolution to report, when the following was read:

The Committee appointed to consider the proposition contained in the resolution offered at the previous session, to the effect that the American Pharmaceutical Association prepare a Pharmacopœia which may be proposed to the final Committee of Revision of the National Convention, and to be submitted to the criticism of the medical and pharmaceutical professions, report that they believe that such action is advisable at this time, and they offer the following resolution :—"That this Association appoint a Committee on the Revision of the U. S. Pharmacopœia, consisting of fifteen members, who shall, by a plan to be determined by themselves, be instructed to prepare the text of the proposed new Pharmacopœia, and that they report progress at each subsequent meeting, and finally lay before the Association at its meeting in September, 1879, a complete result of their labours."

After the reading of this report, a little discussion ensued, when it was adopted, and the President was requested to name the Committee, which he promised to do at the next session.

The meeting then adjourned.

FRIDAY—MORNING SESSION.

The meeting was called to order by Vice-President Ingalls, the minutes were read and adopted.

During the morning session, which was the last one of the Association, replies were read to queries, also volunteer papers.

The President named as the Committee on Revision of the U. S. Pharmacopœia, in accordance with the resolution adopted at the last two sessions: Charles Rice, Chairman; F. Hoffman and P. W. Bedford, New York; J. M. Maisch, J. P. Remington and C. Bullock, Philadelphia; G. F. H. Markoe and S. A. D. Sheppard, Boston; J. F. Hancock, Baltimore; A. E. Ebert, Chicago; C. L. Diehl, Louisville; E. S. Wayne, Cincinnati; W. H. Crawford, St. Louis; Charles Mohr, Mobile; and E. Painter, San Francisco. By unanimous request of the Association the name of William Saunders was added.

The Committee was empowered to draw upon the Treasurer for the sum of fifty dollars.

The Committee on the Exhibit of Chemical and Pharmaceutical Products read the report, which was accepted and referred.

Mr. H. S. Wellcome suggested that the object of the annual exhibitions was becoming promoted into a sort of display for pecuniary gain, and thought they should be abandoned in future. After some remarks the subject was referred to the Executive Committee to report on next year.

Several replies to queries and volunteer papers were read during the session.

The remainder of the time was taken up in the passing of various votes of thanks, etc. The "Health of Her Majesty Queen Victoria," was followed by three hearty cheers from the members.

Finally, the President put the motion that this Association do now adjourn to meet in Atlanta, Georgia, September 3 (the first Tuesday), 1878, at 3 p.m., which was carried.

The following are some of the replies to queries:—

Veratrum viride.—As several different conclusions have been reached by late investigations in regard to the active principles of this drug, an accurate analysis is desired in order to definitely settle the subject. By C. A. Robbins, New York.

The writer claimed to have made a very careful and thorough examination of reliable veratrum viride. The results do not appear to agree in all respects with other investigators. While jervia, veratria, resin, and colouring matter were obtained, the mother liquor (from which some of these principles had been separated) yielded still another alkaloidal principle soluble in ether, and separating in the form of crystalline scales. This, he believed to be a substance different from any heretofore described, but from the small quantity obtained, as yet no definite results could be deduced. The name *veratridia* is suggested for this body, which is said to be quite poisonous, but still different in its action from the usual known products of veratrum. The claim to its different character seems to rest mainly on *colour tests*, which are said to be quite distinct from similar reactions with jervia, veratria, etc.

Confection of Senna.—The present officinal formula for the preparation of confection of senna directs the use of cassia fistula, a drug not always easily obtained, and consequently has caused the substitution of other and less active drugs. Cannot this formula be modified or the cassia fistula substituted by some drug more generally in use? By Adolph W. Miller, Philadelphia.

The writer suggested an alteration of the formula, using the following proportions of materials:—

Senna, in fine powder	8 parts.
Coriander	4 „
Tamarinds	16 „
Prunes	17 „
Sugar	30 „
Water, sufficient.	
The final product to weigh	96 „

The tamarinds and prunes are first treated with boiling water, strained through a fine sieve, this process repeated, the sugar is dissolved, excess of water evaporated till reduced to eighty-four parts by weight when the powdered senna and coriander are incorporated.

Dr. Squibb said that cassia fistula could always be had of good quality. The difficulty lay more in the proper exhaustion of it. His practice was to dry it till the pulp was free from excess of moisture, then crush it very fine, when it was readily exhausted.

Cantharidal Collodion.—Mr. Joseph Roberts, Baltimore, recommended the following formula:—

Powdered cantharides, 8 troy ounces.
Stronger alcohol, a sufficient quantity.
Stronger ether, „ „
Pyroxylon, 144 grains.

Mix equal bulks of stronger alcohol and stronger ether. Moisten the cantharides with eight fluid ounces of the mixture, pack in a percolator and add enough of the mixture to obtain fifteen fluid ounces of percolate. Set this aside, and continue the percolation with the same menstruum until four fluid ounces more are obtained, evaporate this to one fluid ounce, and add to the reserved percolate. In this dissolve the pyroxylon.

Dr. E. R. Squibb said that the greatest difficulty was with the pyroxylon of the market. There were several grades of "cotton" and they varied in solubility. He thought that acetic acid or acetic ether should be used in the percolation as a more perfect solvent for the cantharadin.

White Wax.—Professor P. W. Bedford, New York. The writer stated that from examination and inquiry he was lead to believe that fully 75 per cent. of all the "white wax" sold was adulterated. The bulk of this adulterated wax finds its use through other commercial outlets, and is employed by artisans and for domestic purposes, and a much smaller percentage of what is sold by druggists is adulterated. Nearly every wax bleacher, perhaps every one, makes a lower grade or cheaper priced white wax, which is usually sold with the understanding that it is not pure. The impurities are confined almost entirely at the present time to stearin, paraffin or ceresin. These adulterants give wax a much *whiter* appearance than the usual sun-bleaching can ever do. Pure sun-bleached wax is of a cream colour, and when chewed does not cohere together. When of a dead white colour it is never pure. Paraffin and stearin are both of a lighter specific gravity than wax. Bleached or white wax which is of a lighter gravity than ·950 or heavier than ·970 should be rejected. Pure bleached wax is soluble in five parts of chloroform at 85° F., but at a slight reduction of temperature it has the appearance of a smooth emulsion. Stearin may be detected by its ready saponification when a small piece of suspected wax is heated in a tube with dried carbonate of soda and water. Paraffin and ceresin are not destroyed by sulphuric acid, while wax is entirely carbonized.

Oleates of Mercury, Morphia, etc.—Mr. W. S. Thompson, Baltimore, gave a series of formulæ for these preparations, of which the noticeable features were the preparation of freshly-precipitated oxide of mercury, and, in the case of some of the alkaloids, these were dissolved in alcohol before adding them to the oleic acid. He used purified oleic acid, and also advocated the use of cosmolin as a substitute for a portion of the oleic acid.

Dr. Squibb stated that in his experience he had not failed to accomplish satisfactory results by taking the yellow oxide of mercury and dissolving at once in the oleic acid, *without the use of heat.* A twenty per cent. solution of oleate of mercury, which has the consistence of good butter or lard, is the most stable. Alkaloids were perfectly soluble in oleic acid, and it was unnecessary to use alcohol. He deprecated the use of cosmolin or other patented articles when equally good substitutes can be had cheaper.

Both Professor Remington and Professor Markoe said that both vaselin and cosmolin are liable to change and rancidity, and opposed their use.

Mr. George W. Kennedy, Pottsville, stated that boiling water yields a larger quantity of extract than cold water will. Extract made with cold water is, however, much more active, and this kind should alone be made.

Salicylic Acid.—Mr. David Hays, New York, had examined solutions of salicylic acid made with various solvent salts which were added to facilitate the solution of the acid, and found that the results are not simple solutions of the separate bodies, but that some change takes place by which the acid combines with a portion of the alkaline solvent. When phosphate of sodium is added to the acid in definite quantities and the solution examined, there is found in it a noticeable quantity of salicylate of sodium, free salicylic acid, and the original monohydrophosphate of sodium is changed to hydrophosphate of sodium.

In every case a similar change is effected by the usual solvents.

Dr. Squibb, commenting on the subject of salicylic acid, said that the *dialysed* acid was the best form of commercial acid, but this still retained some impurities, which were separated by sublimation. The process for sublimation was almost identical with that for benzoic acid, but that it must be done over a carefully regulated steam-bath, when it left a residue of dark colour. If done by dry heat, it readily decomposed. As an antiseptic he had used solutions of salicylic acid with great success in preventing the growth of microscopic fungi in alkaloidal solutions.

In another paper Mr. R. V. Mattison, Philadelphia, gave a *résumé* of the various processes for manufacturing this acid, the chemical changes occurring and the various tests of purity. The aid of the various solvents recommended were in his opinion of more than doubtful use, as he thought their therapeutic value injured thereby. The opinion was expressed that, aside from its use in preventing decomposition, fermentation, and similar purposes.

that there was but little other pharmaceutical use for salicylic acid.

Ergotin by Bonjean's method.—In determining the yield by this method when using alcohol of different strengths for the extraction of the aqueous extract, Mr. George Zellhoefer, New York, found that the weaker the spirituous strength of the menstruum, the larger the yield of so-called aqueous extract. Ergot was exhausted with water, and the liquid was evaporated so that each fluid-ounce represented the soluble principles of four ounces (av.) of ergot. The liquid was then divided in portions, and each portion treated with alcohol of different strength, and the liquids evaporated separately to the consistence of a soft extract. The yield was as follows:—

Alcohol sp. gr.	·817,	yields	9	per cent.
,, ,,	·832,	,,	11·5	,,
,, ,,	·860,	,,	15·0	,,
,, ,,	·893,	,,	24·5	,,

The following working formula was suggested:—

Fine ground ergot, 16 troy ounces; cold distilled water, 3 pints; macerate twelve hours, strain and express; to the ergot residue add cold distilled water, 3 pints; proceed as before, mix the liquids, evaporate by water-bath to 4 ounces by weight, then pour it into 1 pint of alcohol, sp. gr. ·832. Mix. At the end of twenty-four hours filter, and evaporate by water-bath to the consistence of a soft extract. Yield 11·5 per cent. This has a dark-red colour, is perfectly soluble in water and should be kept in a cool dark place.

Glycerine in fluid extracts.—Mr. J. U. Lloyd, Cincinnati, is of opinion that glycerine can be used advantageously in the preparation of the following fluid extracts: Cinchona, dogwood, geranium, gossypium, matico, pipsissewa, prunus, rhatany, rubus, uva ursi. For the following it is not deemed better than water: Belladonna root, colchicum root, colchicum seed, colombo, digitalis, ergot, gentian, hydrastis, hyoscyamus, sarsaparilla, sarsaparilla compound, senega, spigelia, taraxacum.

The writer is of the opinion that glycerine extracts vegetable astringent principles and holds them in better solution than does water.

The relative therapeutic value of Aloin as compared with Aloes.—Mr. A. P. Brown had used Tilden's process for obtaining aloin. The result was a fair yield. *Aloin* has the advantage that it *does not gripe*. It has the disadvantage that it is not more active than aloes when given in the same doses, and is much more expensive. The resin which is obtained after the deposition of aloin has no purgative effect. Having noticed a statement that the mother liquor after the deposition of aloin was still an active purgative, a portion was evaporated to dryness with care, and administered, but without any effect whatever. He concludes, therefore, that aloin is the purgative principle, and after its removal the residue is inert as a cathartic.

What knowledge of therapeutics should the properly educated pharmacist possess?—Continued to Benjamin T. Fairchild, New York.

This paper was read only in part. The writer assumes that as the pharmacist should never assume the *rôle* of the practitioner, that there is no necessity for any special training in therapeutics. He should of course be conversant with the general use of remedial agents, and their average doses, but beyond this the pharmacist does not need therapeutical training.

The Bromine production of the United States.—Mr. H. S. Wellcome, New York, stated that the Ohio and Kanawha springs yield a brine which holds twice as much bromine in solution as any other known. The principal factories are located at Parkersburg and Mason city, W. Va., and at Pomeroy, Ohio. The product is about 1000 lbs. per day, although their capacity is about three times as great. About 50,000 lbs. were exported the past year. Bromide of potassium is now becoming the favourite product for exportation.

Oil of Bay.—Mr. G. F. H. Markoe, said that during the past year he had worked up nearly four tons of the leaves. From two to three hundred pounds was the usual charge in a 200 gallon still, and from this from 80 to 100 gallons of liquid were drawn off. The oil as obtained at first is colourless, but soon becomes darker, acquiring in time a light brown colour. The oil readily separates into two portions during the process, and from the first fifteen gallons of distillate, by separating it fractionally, the oil had a varying specific gravity of ·870, ·930, ·946, ·964, ·982, ·990. From the following 65 gallons the oil was heavier than water, was much less abundant, and slower to distill. This portion had the sp. gr. 1·023, 1·035, 1·037. The oil when fresh is quite rank and requires several months to "mellow." The crude heavy oil, redistilled fractionally, gives portions varying from 1·025 to 1·048, the portions up to 1·048 being colourless, then a light brown, and finally a dark oil nearly black in colour. The heavy oil has the odour of clove, is pungent and tingling to the taste; is soluble in alcohol of 95 per cent., in ether, petroleum benzine, chloroform and caustic alkalies, with the latter forming crystals, and is doubtless identical with eugenic acid. Other interesting details were given.

Cologne Water.—Mr. William Saunders, having received numerous requests for a formula for a good cologne which resembled the "Farina" variety, had made the attempt and submitted the following:

Oil of neroli	5 drachms 20 minims.
Oil of bergamot . . .	1 ounce.
Oil of rosemary flowers	1 drachm 20 minims.
Pure alcohol	6 pints.
Water	2 pints.

It is stated that the fragrance of this cologne when compared with the foreign was scarcely distinguishable.

It was suggested that acetic ether was an excellent addition to such a cologne for the sick room. In some comments made upon the quality of alcohol, cologne spirits and deodorized alcohol as found in the market, several persons gave their views, and the different methods employed for purification were alluded to. It is generally conceded that what is sold as cologne spirits is the first twelve hours' run of a clean still, and that this portion of an alcohol run is as good as any artificially purified.

Aniline in Syrup of Iodide of Iron.—Mr. L. M. Connor having reason to suspect some syrup of iodide of iron as imperfect, the colour being of an unusually fine green, the syrup was examined and the colour was found to be due to the presence of aniline green.

Dialysed Iron.—Dr. William H. Pile, noticing the fact that chloride of sodium is one of the most rapid crystalloids to dialyse, had used a solution of carbonate of sodium to add to the solution of ferric chloride in place of the ammonia so generally recommended, and with great success. The solution of ferric chloride which has been neutralized by a cold solution of carbonate of sodium is poured into a floating dialyser. Starting with one pint of solution of ferric chloride, which, on being treated with the sodium solution and ready to dialyse, had a sp. gr. of 1·175, it had in five days increased to five pints. The water in which the dialyser floated was changed daily. At the end of five days it had passed through the membrane all the crystalloids, was free from taste of foreign substances, and owing to increase of bulk had now the sp. gr. 1·0295, and on evaporation yielded 5 per cent. dry oxide of iron. Too long dialysation will cause the solution of iron to become gelatinous.

Parliamentary and Law Proceedings.

The Alleged Adulteration of Citrate of Magnesia.

The charge against Dr. George Smith, M.D., 112, Renfield Street, Glasgow, for selling citrate of magnesia alleged to be adulterated with lead to the extent of ·37 grain per pound, continued from last week, was brought up for disposal at the Central Police Court, before Stipendiary Gemmel, on the 11th inst.

The Stipendiary having intimated that no further evidence could be taken,

Dr. Smith said: I have yet had no opportunity of bringing forward witnesses. I was taken quite by surprise by the prosecution, and, quite accidentally, last court day was able to put two gentlemen into the witness-box, but I had no time then to get up a defence. Understanding, however, that the case was continued, and as it is one of a purely technical and chemical nature, I have been at considerable expense in bringing witnesses into court for the vindication of my character, which has been very seriously injured.

The Fiscal: If you had any intention of leading witnesses, you should have intimated that before now.

Dr. Smith: How could I? I supposed at least that I would get a fair hearing, and never supposed for a moment that the case was closed; and from the nature of the prosecution and the publicity given to it,—to the damage of my good name, as I have already had reason to feel,—I almost demand of the Court, as a right, that I shall be allowed to have the case fully investigated on its scientific, medical, and legal merits.

The Fiscal: Hear what the Court has to say.

The Stipendiary: I think it is quite unnecessary to call witnesses. The case was completed last court day, and continued only for judgment, so that no further evidence can now be led. I think, however, that the defender will be satisfied that this is unnecessary. The evidence given in the case was to the effect that Dr. Smith or his servant, for whom Dr. Smith is responsible, had sold to Alexander Johnston Walker, food inspector, half a pound of citrate of magnesia, not of the nature, quality, and substance demanded, and the section of the Act, under which the present prosecution had been instituted, requires that no person shall sell, to the prejudice of the purchaser, any article of food or drugs not of the nature, substance, and quality demanded, under a penalty. The article asked for was citrate of magnesia, and, according to the certificate of analysis, it consisted of citric acid and magnesia, contaminated with lead to the extent of ·37 grains to the pound. It was brought out in evidence that the article became contaminated with lead in consequence of leaden vessels being used in the manufacture of the citric acid, and that citric acid could not be made without the use of such vessels, nor procured free from lead contamination. It having been established that citrate of magnesia could not be obtained without a small proportion of lead, I cannot hold that an offence has been committed, the article not being sold to the prejudice of the purchaser, and could not be said to be not of the nature, quality, and substance demanded. What was demanded was citrate of magnesia, and what was sold is the only article of that name which can be obtained. The person who purchased the article stated in his examination that he did not know what were the component parts of citrate of magnesia, and therefore it could not be said that what he got was not of the nature, quality, and substance demanded. The quantity of lead found in the citrate was infinitesimal. The pound avoirdupois contains seven thousand grains, so that the quantity of lead present would be about the twenty-three thousandth part. There is no doubt that lead is a cumulative poison, but the quantity in this case was very small, and there was no evidence to prove that it was injurious.

The Fiscal: What of the medical evidence?

The Stipendiary: Under the Act I have no power to find the charge proven. There is a remedy for any evil that might arise from the use of the article. The public are warned by this prosecution that citrate of magnesia contains lead, and that lead is a cumulative poison, and the remedy is not to use the article known as citrate of magnesia. I therefore must find the charge not proven.

Dr. Smith: Am I to be allowed expenses?

The Stipendiary; No expenses can be allowed.

The charge against John Campbell, for selling one and a half ounces of citric acid containing ·4 grains of lead in a pound, was also found not proven, being held as decided by the evidence in the previous case.

The Sale of Soda and Potash Waters.

On Wednesday, October 10, James Cooke, of the Commercial Inn, Galgate, was charged at Barnard Castle with selling soda water containing only 3·64 grains bicarbonate of soda, the British Pharmacopœia directing that an imperial half-pint of soda water should contain 15 grains of bicarbonate of soda.

For the defence it was submitted that the liquid was sold as a beverage, and not for medicinal purposes, and therefore the British Pharmacopœia did not apply.

The Bench concurred, and dismissed the case.

J. Hargroves, of the Coach and Horses Inn, Galgate, was charged with vending "soda water" containing no bicarbonate of soda. A fine of 6*d*. and the costs was imposed.

On Friday, October 12, at the Gateshead Borough Police Court, before the Mayor (Mr. Wm. Galloway), Ald. Biggar, and Ald. Charlton, Mrs. Alice Campbell, soda water and potass manufacturer, was summoned for having sold one bottle of potass water to Mr. Robert Nesbitt, inspector of nuisances, to the prejudice of the purchaser, it not being of the nature, substance, and quality of the article demanded. Mr. Swinburne, the Town Clerk, addressing the Bench, said the object of these prosecutions was to induce a better state of things in the manufacture of potash water. With one exception, in all the cases they were to hear that day there were traces of lead in the samples; this, he was instructed, arose from the carbonic acid gas, which, of course, was a necessary ingredient in this article, being generated in a lead tank, and also conducted from the tank in leaden pipes. In some cases block tin had been used instead of lead, which had proved effective, and would be a great benefit if universally adopted.

Mr. Nesbitt proved that the potass was purchased of the defendant, and on being analysed was found to contain 3·65 grains of solid matter per half-pint, part of which was lead.

Mr. Edgar informed the Bench that 3·65 grains of potass in a half-pint bottle was much less than the quantity that should be present. He should expect that, as a beverage, it should contain five grains at the least. There were, however, mere traces of lead. Lead was poisonous; but he did not think it was present in a poisonous quantity. It was an accumulative poison, however, and if taken constantly it might be injurious. As a medicine he would expect 15 grains of potass.

Mr. Joel, in defence, contended there was no evidence showing what really was the standard. Mr. Edgar thought it should contain five grains as a beverage, but there might be people who only wished for three grains in their potash water.

The case was dismissed.

John Middleton and Thomas Pearson, soda water manufacturers, were charged with selling soda water which was not of the nature, substance, and quality demanded by the purchaser. In the samples purchased by Mr. Nesbitt there was a total absence of bicarbonate of soda, and the water was merely charged with carbonic acid gas.

A fine of 20*s*. and costs was imposed in each case.

Ralph Campbell, R. H. Dawson, and Joseph Todd were similarly charged by Mr. Nesbitt. The evidence showed that there was a portion of bicarbonate in each sample, and no standard being proved the cases were dismissed.

POISONING BY CARBOLIC ACID.—A FATAL MISTAKE AT CHESTER.

Mr. John Tatlock, coroner for the city of Chester, held an inquest on Monday, Oct. 15, on the body of Alice Ann Ainsworth, wife of a beerhouse keeper, who died on the previous Saturday from the effects of poison. From the evidence it appeared that the deceased was addicted to drinking whisky, and her husband stated that she drank a great deal of it, generally about half a pint a day. On Saturday evening, having been working rather harder than usual, she went to bed, and was seen before doing this to take a drink of something on the stairs going up. The tumbler out of which she drank was brought down by her son, and as it smelt very strong, the husband became alarmed and went up stairs, where he found his wife speechless. He then called in a doctor. On the sill of a little window on the stairs was found a small bottle containing carbolic acid, which had been used in disinfecting the house; and as the contents of the woman's stomach smelled strongly of that poison, there is no doubt she drank some of it in the dark in mistake for whisky. The jury found to that effect.—*Liverpool Mercury.*

Dispensing Memoranda.

We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be considered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.

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[31]. In reply to the query of J. S. P., Cambridge (No. 31), I beg to say that I have frequently dispensed camphor and hydrate of chloral with lin. saponis or glycerine. J. S. P. will find, what I understand a great many other dispensers are ignorant of, that if he rubs the camphor and hydrate of chloral together in a mortar for a few minutes, they form a thin liquid (why, is easily explained), (*sic*) to which he can add the glycerine, without any trouble. Very often the hyd. chloral and camphor are prescribed alone, and as some of us wild Irishmen can testify is unsurpassed as an anodyne liniment.

HENRY TARAFFE.

Londonderry.

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[31]. Reduce the camphor to a fine powder with spirits of wine, and dissolve the chloral hydrate in a small quantity of glycerine with a gentle heat. Mix the two solutions with the remainder of glycerine.

CHEMIST.

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[31]. If J. S. P. will take the trouble to rub the chloral and camphor in a mortar until dissolved, then add the glycerine, he will obtain an opaque mass about the consistency of vaseline, with the camphor in a state of fine division. If he applies a gentle heat to the mass until it becomes clear, on cooling, he will have the veritable glycerine jelly.

J. L.

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[31]. If J. S. P. powders the camphor finely, and then mixes it with the chloral, he will obtain a damp pasty mass, which when rubbed with glycerine in a mortar gives a substance resembling glycerinum amyli; this must be sent out in a wide-mouthed bottle.

PHARMACEUTIST.

Cambridge.

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[32]. LIN. SAPONIS.—In reply to Mr. Burton I would recommend him in future to use sapo mollis, B.P. This gives a satisfactory liniment without any trouble. I have found sapo cast. and sapo animal. very unmangeable after they once become hard by keeping.

G. B.

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[33]. Could any correspondent kindly inform me the best way of making the following prescription up so as form a clear mixture without filtering it?—

℞	Spirit. Æther. Nit.	ʒj.
	Bicarb. Ammoniæ	ʒiss.
	Tinct. Hyoscyam.	ʒj.
	Sp. Camphor.	ʒiij.
	Liquor Ammon. Acet.	ad ℥viii.

Make an eight ounce mixture.

J. B.

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[34]. What would be the proper way for dispensing the following, which was brought us to day?—

℞	Hyd. Bichlorid.	grs. ij.
	Ext. Opii	,, ij.
	Confect.	q. s..
M.	Ft. pil.	Mitte xxx.

GULIELMUS.

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[35]. FERRI CIT.—When "Ferri" Cit. is ordered in a prescription should Ferri et Ammoniæ Citras be used?

BURTON.

Notes and Queries.

[555]. LIP SALVE.—

℞	Ceræ Albæ	℥j.
	Ol. Amygd. Dulc.	℥iss.
	Ol. Rosæ Conc. (Allchin's)	ʒiij.

Melt, and when nearly cold, add six drops of otto of roses.

CHEMIST.

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[556]. DRUG MILL.—Can any of your readers recommend a small mill in which chemists could grind their own linseed for poultices?

W. S.

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[557]. WHITE OILS.—Will any reader favour me with a formula for White Oils, for horses and cattle, which will be perfectly white, about the consistence of cream, will not separate, and will do to apply to fresh cuts, broken knees, etc.? It must not contain ammonia.

N. W. S.

[558]. COPYING PAPER.—Can any reader inform me as to the mode of preparing a paper for copying tracings, producing a blue ground and white lines after exposure to direct sunshine and washing in water?

NEMO.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

PROSECUTIONS UNDER THE PHARMACY ACT.

Sir,—The *Pharmceutical Journal* of the 13th inst. contains a report of two prosecutions under the Pharmacy Act, of 1868, in the Birmingham Police Court; one against Anson Edwin Martin, the other, John Stuart Careless.

The decision of the magistrates throws a new light on the working of that Act. Had either of the parties been prosecuted under the 15th section, doubtless a conviction would have resulted; but I put aside the non-registration as irrelevant to their alleged offence under the 17th section, and submit that they are actually guiltless of offence under that section.

The object to be attained is primarily the safety of the public. To insure that, it is provided that bottles or packages containing poison shall bear evidence to direct the police to the source from whence the poison has been obtained; to give a clue to the offender if crime has been committed, but no less to avert mischief, if possible, by an immediate discovery of the nature of the poison.

Surely, where a business is conducted under the name of a well-known firm, whether a firm still existing or one which has sold its interest, and probably the right to continue its name, that name on the label points more instantaneously to the establishment at which the article was obtained than would the name of an unknown man who has become the proprietor of the business, keeping the old title over his door, on his invoices, and probably using it as a business signature. I might cite many such cases, as examples, but at the moment one specially occurs to me.

If laudanum be purchased at the Apothecaries' Hall, I believe no name will appear on the label, save the title of the establishment, and, indeed, no other could be needed. Why, then, ask for more, especially when the addition would rather confuse than enlighten? It may be the letter of the law would be more positively obeyed, but certainly not the spirit. I think the magistrates at Birmingham fell into this error, and I regret exceedingly that the gentlemen who were employed to defend the accused did not ask leave for an appeal to a higher court.

Looking back thankfully to the advance which has taken place in the condition of chemists and druggists since the establishment of the Pharmaceutical Society, and onward hopefully for good effects to arise from the temperate administration of the Pharmacy Acts, I can but view the course taken by the prosecutors in these cases as trivial and impolitic, tending only to bring the Acts into ridicule, as some over zealous persons have brought the Adulteration Act, by treating unavoidable impurities, consequent on the "process of collection or preparation," as fraudulent admixtures.

M.P.S.

October 15, 1877.

DANGEROUS COLOURED FIRES.

Sir,—Possibly the following hint may be of some use to those who are in the habit of making coloured fires. I am told that in making fires which contain chlorate of potash and sulphur, their safety from explosion depends upon having the sulphur free from acid; this can be accomplished by washing it in two or three charges of hot water, then with a solution of carbonate of soda, and finally with water again. I adopt this plan and have had no accident, although I have kept for a year coloured stars, etc., made with a similar composition to the one spoken of by Mr. Windle.

In conclusion, I think it would be a boon to a many if the subject were freely discussed by your columns.

G. W. WALTER.

BLEACHING ACTION OF TURPENTINE.

Sir,—It is to the production of peroxide of hydrogen that turpentine probably owes its power as a cleanser and bleacher of wood, and as such it has been used for some considerable time with very good results; the process simply being to sprinkle some turpentine over the staircases, floors, etc., preparatory to the "spring cleansing," but of course, from the inflammatory nature of the material its use as a household cleanser is to be by no means recommended.

That the ol. folii sylvestris contains the peroxide of hydrogen in considerable quantity may be expected from the powerful bleaching effect upon the cork of the bottle containing it and its great tendency to oxidation.

G. C. DRUCE.

Northampton, October 15, 1877.

T. S. Edwards.—You appear to have read our answer of last week carelessly; the sentence placed between inverted commas in your letter does not occur in it, and your strictures are therefore unwarranted. Any information you may possess respecting a breach of the Pharmacy Act should be communicated to the Registrar. We have no objection to your resolution to stamp out what you humbly believe to be wrong, provided that you take reasonable precaution that you yourself are right.

"*Magnes. Sulph.*"—As the questions were optional, and both were moderately easy we do not think it probable that any of the candidates suffered under any disadvantage. Thanks for the correction.

"*Plevna.*"—The only book bearing the title with which we are acquainted is published by Groombridge and Co.

A. Mitchell.—The liq. ammonii caustici spirituosus of the German Pharmacopœa is prepared by passing gaseous ammonia into alcohol of sp. gr. 0·830 until the solution has a sp. gr. of 0·808 to 0·810, when it will contain about 10 per cent. of NH_3.

F. B. L.—(1) We are not aware that the Society has made any arrangement for the publication of its proceedings. (2) The Registrar is Mr. H. J. Fennell, College of Physicians, Kildare Street, Dublin.

B. J. K.—The questions are published as communicated to us officially. We have no other knowledge of what takes place in the examination room. If you wish for further information you are recommended to write to the chairman of the Board.

K. R.—The form is frequently used by physicians and should be translated "every four hours."

E. A.—We do not know; apply to the Secretary of the Society referred to.

Student.—The solubility of salicylic acid in water is considerably increased by the addition of ammonium citrate; borax and sodium phosphate have also been recommended. See however p. 316 of the present number.

"*Associate.*"—Huxley's 'Lessons in Elementary Physiology' (Macmillans).

R. J. M.—*Œnanthe crocata.*

"*Malva.*"—The specimen is a white variety of *Malva moschata.*

J. G. Oliver.—We are unable to say. You are recommended to write to the editor of the *Gardeners' Chronicle* or the *Garden.*

N. W. S.—Blaine's 'Outlines of the Veterinary Art,' (Longmans).

"*Natura.*"—(1) The passage probably occurs in one of the works of Dr. Thomas Thomson on Chemistry. (2) No.

A. Tomline.—Rodwell's 'Birth of Chemistry' (Macmillans).

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Moore, Mr. Howie, Mr. Wallis, Mr. Sparshott, Mr. Edwards, One who has been a Chemist, Associate, J. L., J. W. A.

"THE MONTH."

The reign of flowers is over. No indigenous medicinal plant comes into blossom this month. The trees have been stripped of their leaves by the equinoctial gales, and the early morning frosts have nipped the more tender plants, leaving little but berries, with here and there a bright-tinted leaf, to adorn the now almost naked hedgerows. Flowers must now give place to plants more ephemeral, but often vying with them in beauty of tint, and occasionally in odour also. Fungi are now the order of the day, and mycologists are now hastening from all quarters to their annual festivals and social gatherings at Paris, Hereford, Dunkeld, and elsewhere. Inviting as some species may be to the palate of experienced mycophagists, fungi can scarcely be said to be general favourites, and but few of them possess pharmaceutical interest.

One of the most beautiful of our native species, however, the Fly Agaric, *Amanita muscaria*, Fr., has of late attracted attention on account of the muscarine which it contains, an alkaloid which has been found to have an effect upon the system opposite to that of atropine. This fungus is not uncommon in this country, but is more abundant in the north than in the south of England. It grows most frequently in fir, beech, or birch woods, and may be at once distinguished by the bright vermilion cap or pileus, studded with white, or slightly yellowish warts, the pure white gills and tall white stem, swollen at the base into a kind of bulb, and furnished with a loose ring a short distance below the pileus. Several other British fungi have a bright red cap, but are without the warts and ring, and have a shorter stem not bulblike at the base. When young the whole of the fungus is enclosed in a thin white envelope, which is called a volva; as the stem elongates this envelope is burst, and the upper portion of it, remaining adherent to the cap, is split up by the further growth of the cap into the warts, which form so prominent a feature in this species. A figure of the plant is given by Pereira, who mentions that many Siberian tribes use it as an intoxicating agent. Muscarine also derives further interest from having been considered as identical with an oxidation product of choline or neurine, a substance found both in bile and in the brain.

This is also the time of year when fresh supplies of ergot are coming into commerce. Ergot must not be confounded with the perfect plant of *Claviceps purpurea*. The ergot of commerce, as may be seen by microscopical section, consists only of delicate threads closely felted together into a hard mass or sclerotium, which corresponds in some measure to the spawn of a mushroom or the prostrate threads of mildew. These threads are formed at the expense of the grain and replace it, and the sclerotium so formed is the means by which the plant is kept alive throughout the winter. In March or April the sclerotium gives rise to one or more plants of the true fungus which look like miniature mushrooms, but differ altogether in structure, the spores not being placed on gills but in little sacs, in cavities in the little rounded head of the fungus. This structure is well illustrated in Pereira's 'Materia Medica.'

The hedge banks, although not yielding flowers, yet offer a few fruits of pharmaceutical interest. The dog rose, *Rosa canina*, is now covered with scarlet "hips," familiar to schoolboys as an instrument of torture to their unlucky fellows. The hairs inside the fruit are almost as irritating as those of cowhage. The fruit in this case consists of more than the ripened ovary, since it includes the calyx tube and the thalamus which lines it. It should be stated, however, that what is here spoken of as the calyx tube, is by some botanists regarded as the hollowed out pedicel.

If the fruit be carefully split open it will be found that what appear to be seeds have each a style, terminating in a stigma, and are therefore carpels, which, from their one-seeded indehiscent character, are called achenes. These styles will be seen to pass through an opening at the top of the fruit, where the calyx tube is not perfectly closed. The fruit, on account of its curious structure, has been called a cynarrhodon, from two Greek words, meaning dog and rose. It has, however, exactly the same structure as the etærio, or collection of achenes in the buttercup and clematis fruits, except that the achenes are enclosed in a calyx tube, and it may be therefore regarded as an inverted etærio.

The fruits of *Rhamnus catharticus* are now in good condition for gathering. The structure of the fruit and the difference in shape of the endocarps of the fruit, have already been alluded to in the June number of this Journal.

One plant still remains to be noticed, *Ricinus communis*, L., the castor oil plant. Under the name of palma christi, it is cultivated in gardens and shrubberies as an ornamental annual, the foliage being the chief attraction. In this country the plant usually reaches the height of 5—10 feet. Its large handsome leaves and succulent-looking stem, covered with a fine grey bloom, render it a striking object. The leaves are palmate, and have lanceolate serrate segments. At the point where the leaf-stalk joins the leaf will be found a saucer-shaped gland. The leaves have been used in the shape of a poultice for reducing hard swellings, and are still used in the form of fluid extract, with considerable success, as a galactogogue. The spike of flowers is not very conspicuous; the staminate flowers, which occupy the bottom of the spike, consist of a calyx with 3—5 ovate concave segments, and enclose a great number of stamens, the filaments of which are combined into a number of bundles (polyadelphous); each of these bundles consists of several stamens, the filament of which are united together at different distances, giving each bundle a corymbose habit. The pistillate flowers, which are at the top of the spike, have a more deeply cut calyx and a somewhat globular bristly ovary, surmounted with three long, flattened, forked, bright red, hairy stigmas. Were it not for the colour of these stigmas the inflorescence would scarcely be noticed. The three-celled fruit, when ripe, somewhat resembles that of the thorn apple in appearance, but splits loculicidally and septicidally into six valves, exposing the three seeds. The seeds have a strong resemblance in shape and appearance to the insect known as a sheep tick, whence the Latin name of the plant, *Ricinus*. Although only an annual in this country, one of its varieties, in the north of Africa, attains the height of a tree, and lives for several years. The plant is extremely variable in size and character, and the seeds also vary in size, no less than thirteen varieties being offered for sale by some London florists. The capsule also, in some forms, is quite free from bristles.

The seeds vary exceedingly in size, marking, and colour, the oil obtained from the smaller kinds being supposed to be the best. At the point where they are attached to the carpophore, which occupies the centre of the capsule, they are furnished with a caruncle or strophiole, a growth which is formed from the edge of the hilum. From the caruncle a line (raphe) proceeds along the flatter surface of the seed toward its opposite end where it forks and disappears, the point of its disappearance being where it passes through the testa to the inner coat or urdoplura, on which a dark spot indicates where the veins of the chalaza radiate. These veins can be readily seen by slicing off this part of the nucleus and holding it up to the light. When the seed is split open the veins on the two thin cotyledons can be distinctly seen. These cotyledons adhere so closely to the albumen that they cannot easily be separated, but a similar structure is easily seen by splitting open a croton seed, in which the cotyledons can readily be separated from the albumen. Castor oil seeds were formerly known as *Semina cataputia majora*, those of *Euphorbia lathyris* L., being called *Semina cataputia minora*. The castor oil plant possesses an additional interest from the supposition that the "gourd" spoken of in the book of Jonah was no other than this well-known plant. Certainly the Greek name of the castor oil plant (Kiki) has some similarity in sound to the Hebrew Kikajon, translated "gourd," and the castor oil plant is remarkable for its rapid growth, attaining a height of twenty feet in a single year in hot countries.

The 'Medicinal Plants' for this month contains one American and six Indian plants. *Hydrastis Canadensis* is official in the American Pharmacopœia as a tonic, and like the two next on the list, *Coptis trifolia* and *Berberis aristata*, is remarkable for containing berberine. *Abrus precatorius*, *Cassia fistula*, *Alstonia scholaris* and *Calotropis procera*, are the other species figured. *Cassia fistula* receives a double plate, on which the pod and structure of the seed are well shown. The seed of this plant is remarkable for containing a quantity of horny albumen, which is not common in leguminous seeds. *Abrus precatorius* yields a root which is used as a substitute for liquorice in India. To this plant belong the small pretty scarlet seeds, with a black spot at one end, which are often seen in necklaces, etc. *Alstonia scholaris* yields a bitter tonic bark, and *Calotropis procera* a root bark which is used as an alterative. *Berberis aristata* yields a bark, the extract of which has been long highly esteemed as an application in diseases of the eye. The execution of the plates in the present number is rather above the average.

The *Gardeners' Chronicle* reports that the superintendent of the botanical gardens at Gunesh Khind, Poona, has published a list of the drug-yielding plants cultivated in the garden, with a view to their being utilized by the public in cases where the fresh plant is difficult to procure in the bazaars, etc. The list comprises about one hundred plants.

An interesting discovery has recently been made of a fossil fungus, bearing a close relation to that which causes the potato disease, and which has been named *Peronosporites antiquarius* by Worthington Smith, whose name is so well known in connection with the discovery of the resting spores of the potato fungus. The fungus was discovered by Mr. Carruthers, of the British Museum, in the stem of a gigantic fossil clubmoss (*Lepidodendron*) from the coal measures. The occurrence of a fungus in which the delicate threads and fructification are preserved in all their delicacy of outline offers a hint to microscopists of the possibility of preserving similar structures in a solution of silica. The occurrence at so early an age in the world's history of forms almost identical with those found at the present day, appears to indicate that, however much evolution may cause the appearance of new forms, the weakest do not always go to the wall.

In the medical journals there is very little to be gleaned for pharmacy. The use of salicylic acid in the preservation of leeches is advocated, in the proportion of thirty drops per litre of a three per cent. solution; Dr. Farrar recommends chloride of calcium in solution, containing sixteen grains to a drachm, as the most convenient form for dispensing purposes; a saturated solution of bicarbonate of soda has been spoken highly of as a remedy for burns and scalds, if promptly applied; Dr. Dougall has found that an "ointment," or liniment, made by emulsifying one part of gurgun oil, with three parts of lime-water, is a very convenient form for external administration in leprosy, and he administers internally an emulsion of equal parts of each ingredient in half-ounce doses; choleate of sodium is recommended by Dr. Van Biber, in chronic jaundice, deficiency of bile, and as a preventive of gall stones; and, lastly, picric acid, in the proportions of 30 parts in 1000, is said to have been used with success in mammary fissures.

At the drug sales matico, largely mixed with a smooth-leaved species, probably *A. adunca*, has been noticed, whilst the fruits of the plane tree have been offered as cowhage, and tamarisk galls under the name of African berries.

The "Dispensing Memoranda" column has to acknowledge indebtedness to several correspondents for friendly hints which, though not formally acknowledged, have been thankfully received, and when available, utilized, and embodied in the month's review. A continuance of such suggestions is invited, because the questions, being generally of a varied character, the more freely such a course is taken, the more valuable will be the results. Information coming from different sources will serve to indicate the prevailing customs in several localities, and probably under different circumstances, and if certain correct principles be laid down for general guidance, it may reasonably be hoped that uniformity of practice, to a greater degree, will be the ultimate result.

No. 19 is headed "Cinchonine Preparations." In an eight ounce mixture there is prescribed ℨiv. syr. cinchon. for which a good formula is required. Probably the writer of this prescription meant syrup of cinchona, or syrup of cinchona bark, not syrup of cinchonine; if so, there is no official formula for this preparation in the British Pharmacopœia. About the earliest formula is that in the 'Pharmacopeia Manuelis Antwerpii,' 1812:—"Recipe cinchona coarsely powdered, 1 ounce; distilled water, 8 ounces; macerate 24 hours, express strongly, and add 14 ounces of sugar." Brande gives ext. bark, ʒij.; syr. of orange peel, ℥ij. Other writers on pharmacology give methods for making a syrup of cinchona in a more circuitous way, but as there is no official formula, and the ext. cinch. liq., B. P., a reliable preparation, is always at hand, this syrup may be extemporized by adding ʒj. of the fluid extract to ʒvij. of simple syrup. If syrup of cinchonine be intended, there is a published form in Majendie's formulary, ℈j. of cinchonine and ℥xvj. of syrup, but this proportion of cinchonine is much too small to be of any value in the doses in which syrups are usually given. When a preparation is prescribed, for which there is no official or generally recognized formula, it must be expected that if the prescription is dispensed in different places it will be with different results, and as the first was sent out from the prescriber's own establishment and pleased the patient because it was sweet, it may be accepted that the writer of the prescription succeeded in hitting the patient's taste if he did not succeed in diagnosing the patient's disease.

No. 20.—The aq. caryoph. of this mixture is not in the B. P., and a dispenser would be justified in making it in the same manner and in the same proportion as the aq. menth. pip. or aq. menth. vir. are ordered to be made, by adding the oil to the water and distilling. With aq. caryoph. thus made, this mixture would be almost clear; but if the aq. caryoph. be drawn from the cloves instead of the oil the result will be an opaque water which must necessarily make a more or less opaque mixture, but not a *thick* opaque mixture as described.

Aq. caryoph. drawn from the cloves themselves is more grateful than any one of our medicated waters, with the exception of cinnamon, with which it compares favourably, and is to be hoped that in a future edition of the British Pharmacopœia this water will take its proper place, either as an addition to, or still better, as superseding the inf. caryoph., for which it will be an efficient and elegant substitute.

No. 21.—In dispensing a prescription containing a powder thus, ℥j., the apothecaries' ounce should certainly be used; the symbol ʒj. represents 60 grs. and ℥j. eight times 60 or 480 grs.

No. 23 contains a gargle with tinct. myrrh. and alum. If this prescription contained tinct. myrrh. only, with the diluent, it would be sufficient to fill the bottle three parts full of the fluid, to add the tinct. myrrh. and shake, when a homogeneous mixture would be the result; but on the addition of alum the resin separates and adheres to the sides of the bottle. In this mixture, as in others of a similar character containing tinctures of resins or gum resins the addition of a little mucilage from ʒij. to ℥ss. in an eight ounce mixture will cause a perfect emulsion; it should be added to the bottle three parts full of fluid, and before the tincture is poured in, the subsequent addition of alum will not then cause a separation. The second under the same number, containing tinct. guaiac. am. may be made by filling the bottle three parts with the water, then adding the tincture and finally the chlorate of potash; the mixture is for the time perfect, but in twelve hours or so, there will be a flocculent deposit. This may be avoided and a permanent mixture made by a course of procedure as in the preceding prescription, the addition of ʒij. to ʒiv. of mucilage. There is no occasion in either case for trituration in a mortar.

No. 24.—Pills can be sugar-coated without difficulty, provided that the proper plant be brought into requisition, and the same method adopted as is employed by confectioners for sugar coating almonds and various other confectionery. The pills are put into a jacketed pan, heated by steam, and kept continually in motion, hot syrup being added at intervals until a sufficient coating of sugar has been obtained. There is a small American apparatus, mentioned by Professor Markoe at the Brighton Conference, for sugar coating pills extemporaneously. The apparatus is heated by a spirit lamp; but as it has not been introduced into this country, there is no opportunity to express any opinion as to its value. With regard to the white coating other than sugar, the subject has been frequently discussed in this Journal, and reference should be made to its back numbers. The method usually employed is to coat the pills with the tolu varnish, let them well dry, then moisten the surface of the pills with a mixture of gum and syrup, and roll in French chalk, at the same time applying a little heat. This process should be repeated until the coating is satisfactory; still, however satisfactory at first the appearance of the pills may be, one objection seems to apply to this kind of coating, it cracks and exposes the uncovered surface of the pill.

There is a future for coated pills of two kinds, one that will bear being shaken about without injury, of these the sugar coated pills of the United States may be taken as a type; the other of a more temporary character, elegant specimens of which are also occasionally met with. For the preparation of the former, time may be of little importance, and permanence necessary. For the latter, the coating may be of a more extemporaneous character and quickly done, satisfying the requirements of the dispensing counter by a moderate degree of permanence. These are desiderata not yet supplied, wants felt, but not yet satisfied, remunerative problems for solution, within the reach of an enterprising pharmacist.

No. 25. An important question this, but one not difficult to answer. The emplast. canth. is ordered to be spread for a blister, and if properly made and kept, will usually produce vesication, but to add powdered cantharides, or any other vesicating substance, to the surface of a blister, is not admissible, without the order or sanction of the medical attendant. In fact, this practice is not unattended with danger; the application of powdered cantharides to the surface of a blister has produced strangury, for which the pharmacist would certainly be held responsible. If the emp. canth. of the British Pharmacopœia be unsuitable, or of insufficient strength, to produce the desired result, reliable evidence to this effect would most probably induce a change in the formula in a future Pharmacopœia. The manner of spreading a blister may be a question of taste, or usage, but when once spread, any further addition is going beyond the record, and censurable; it should also be unnecessary otherwise than in exceptional cases, for which it is the duty of the prescriber to make adequate provision by any addition he likes. Many practices of this description owe their birth to unreliable blistering plaster, and the remedy should commence where the evil dates its origin.

No. 26. A formula for ung. hyoscyami is required. In the British Pharmacopœia there is one for unguentum belladonnæ: 80 grs. ext. to ℥j lard, and the same proportions may be adopted in making ung. hyoscyam., more especially as in the German Pharmacopœia there is a formula for ung. hyoscyam. just in these proportions. Another method of making it has been referred to, but as this preparation is not likely to be kept in stock, and cannot be made extemporaneously, the dispenser would be justified in adopting the ung. bellad. proportions in making ung. hyoscyam.

No. 27. Aq. camph. conc. A reference to the early numbers of this Journal will answer this question; the subject was fully discussed in its pages about thirty years ago, and even since that time it has occasionally cropped up. To determine a question of this character, no pharmacist with an atom of self-reliance should sit still and ask questions. A solution of camphor is required, which when added in the proportion of one to seven, of water, will make an extemporaneous aq. camph. The aq. camph., B. P., contains (Squire) gr. ½ to the oz.; to make aq. camph. conc., one to seven, each drachm of this essence must contain half gr. of camphor, dissolved in spirit and diluted to a state that will best mix with water. A few experiments will readily determine the requisite proportions.

No. 28. The difficulty has most likely arisen from the use of precipitated, or *pure* milk of sulphur, which should, probably, now be called the "cream" of sulphur, in contradistinction to the impure milk of sulphur, for which the appellation of "skim milk" of sulphur would be very appropriate; the latter will mix, deposit, and shake up, as required, and is better adapted for making this lotion than the pure precipitated preparation official in the British Pharmacopœia.

While the month of October was yet but a new-born infant the words of science—popularly so termed—dinned in its ears. Professor Tyndall, at Birmingham, was expounding his views of the inherent order and energy of the universe as opposed to those assuming them to be "imposed from without" by arbitrary will exercised, as the professor remarked, "by what Carlyle would call an Almighty Clockmaker." It was the study of the conservation of energy, which the lecturer took up in illustration of his meaning. The human body was to be regarded as a machine possessing no creative power, but capable of doing work in virtue of the combustion process occurring in the blood and in the muscles, or, to put it in Mayer's own words, "As an engineer by the motion of his finger in opening a valve, or loosening a detent can liberate an amount of mechanical energy, almost infinite compared with its exciting cause; so the nerves, acting on the muscles, can unlock an amount of power out of all proportion to the work done by the nerves themselves." Helmholtz, in 1851, affirmed nervous transmission to be a comparatively sluggish process—messages being transmitted at the rate of only seventy feet a second, while light travels at the rate of one hundred and ninety thousand miles a second. The power of doing work in the human body is, beyond doubt, referable to the oxidation process effected in the blood and in the muscles: it is a dynamical problem. But granting this, we are still left without an adequate appreciation of consciousness and will, of emotional and intellectual action; these are properties possessed by no other machines, whether we regard them or not as of an ordinary dynamical nature. This became the sticking point with Professor Tyndall, who asked himself the question, was he not forced by his own exposition "into the hypothesis of a free human soul?" He confessed he could not answer the self-imposed problem, nor could science decide how far every man was a free agent, how far capable of impressing or creating circumstances, or how far the creature of circumstance. But reflection, said the lecturer, would prove that human beings are "not complete masters of the circumstances which create their wishes, motives, and tendencies to action;" there may be a predetermined condition, but it is one which admits of cultivation, perversion, development and repression.

The beginning of the month, saw too, the opening of the winter session of the various metropolitan medical schools, when introductory addresses were delivered to the students; the only one possessing any interest for these columns, namely, that by Professor Lister, has been already noticed.

The Sanitary Institute of Great Britain held its first congress at Leamington early in the present month, its whole conduct being imitative of the plan pursued at the British Association meetings. A very successful exhibition of sanitary apparatus and appliances was simultaneously opened, and various addresses and papers were read to small audiences. Some of these had better never been written, for, beyond the propagation of unproven hypotheses and untrue statements arising from ignorance of the subjects therein treated, they served no other purpose save that of the false glorification of their authors. Dr. Richardson gave the inaugural address and speculated upon the origin and dissemination of zymotic disease. Rejecting the germ theory, he maintained that the poison characteristic of each disease originates in the subjects affected, as the product of a perversion of the process of secretion, just as in the cobra a poison is produced by natural secretion. The change in the secretory process may be brought about or accelerated by such conditions as are afforded by starvation, bad food, overcrowding, etc., and the secretion thus rendered poisonous, independently of any innoculation from without, is capable of being communicated to a second person.

This theory, rational enough so far as it goes, is, like the germ theory, entirely an unproven doctrine as yet; it may be true, but it is as probably untrue. To time and the extended application of chemical and histological methods of research, the decision of such matters must be left. Till then an imperfect knowledge of the relation between the sanitary conditions of individuals and the circumstances of their lives will be the only guide in arresting and exterminating zymotic disease. Mr. Brudenell Carter dwelt upon this matter in a charming piece of oratory on the last day of the congress, and insisted upon the institution of a complete registration of infectious disease, and other matters within the legislative power to effect.

King Sewage came out at the congress with his usual importance and train of followers, but in relation to him it is only requisite to mention one paper, which suggested that since no process of chemical treatment *per se* can efficiently purify sewage, the effluent waters shall be passed through filter beds of "sanitary carbon," the debris remaining after the destructive distillation of kimeridge shale, and constituting practically a kind of animal charcoal. It is stated that as a purifier of sewage its value has been tested at various places; it costs about £3 per ton, and the exhausted filter beds mixed with the sludge give, according to the paper, a portable, cheap, and useful manure.

Dr. Moffatt read a paper on "Turpentine and Terebene as Disinfectants," in which he stated that some years ago he had found turpentine, juniper oil and other essences to be ozonizers. He had compared terebene with common turpentine and found it to be far less efficacious as an ozonizer, and therefore as a disinfectant; next to phosphorus he therefore recommended turpentine as an ozonizing agent. It might shock Dr. Moffatt's science to learn that neither turpentine, terebene, nor phosphorus, are either ozonizers or disinfectants; nevertheless, such is the case. These substances by aerial oxidation in the presence of water all give peroxide of hydrogen and no ozone whatever. If we cannot all be original we should at least curb the passion for authorship.

A recent number of the *Wine Trade Review* has an article on "Australian Wine, and English Duties." It will be known that the English custom-house authorities refuse to admit any Colonial wines exceeding 26 per cent. of spirit as natural wines. As the Australian wines reach this country they contain more alcohol than this, and hence the duty imposed upon them prohibits the Australians from offering their wines in this country at a cheap rate. According to the journal quoted, the English authorities base their action upon the dictum of Dr. Thudichum to the effect that no natural wine exceeded twenty-six per cent. of spirit, and if this be so, the dictum is at least correct. Experiments that have been made with the view to produce an artificial wine containing more than this amount of alcohol, have all failed and led to the same conclusion that fermentation cannot proceed beyond the point at which this proportion of alcohol is attained. The *Wine Trade Review* and the Australian discontents must therefore find another basis for discontent than the dictum of Dr. Thudichum. They maintain that the wine growers of Australia can produce natural wines containing from 28 to 29 per cent. spirit, and even more. If so, they should have no great difficulty in establishing the truth, but in the meantime it is to be regarded as more likely that any such wines are fortified by the addition of brandy.

The *Analyst* for October shows evidence of a fit of indignant virtue, and with a trait of character peculiarly its own, calls attention to an alleged case of poisoning as affording a practical commentary on the paper published in this *Journal* refering to copper in preserved peas. The statement of the *Analyst* would not merit attention, except as an example of the sort of illogical reasoning and precipitate conclusions to which public analysts attain. Mr. Gatehouse, of Bath, analysed the stomach and viscera of the deceased, and found that the liver contained 1·16 grains of copper, and the other viscera 2½ grains. The *Analyst* then goes on to say "It certainly appears that this one case is worth far more than all the experiments made by the authors of the paper in question." The fact is that the possibility of poisoning by a large quantity of a soluble salt of copper was never called in question; but it was shown that the minute traces contained in preserved peas—owing to a number of conditions, one of them being the insoluble combination in which the copper exists—passed through the body without having entered the system at all. Where then is the commentary to which the *Analyst* alludes? Is it sustained by the fact that as much as 0·3 grain of sulphate of copper was taken daily for nearly a fortnight without harm, or by the fact that nearly the whole of this copper passed out with the fæces? Nothing would perhaps afford the authors of the paper in question more enjoyment than an attempt on the part of the *Analyst* to poison them with preserved peas!

Speaking of analytical troubles, it appears that a certificate given by Dr. Muter relative to a sample of suspected butter has been considered insufficient to establish the alleged adulteration to which it referred. The grocer who was summoned obtained a certificate from Somerset House which set forth that the butter was genuine, and accordingly the case was dismissed. Without characterizing Dr. Muter's certificate, or that from Somerset House, in any way, it must be regretted that as yet there is no good method of butter analysis known which would prevent the lamentable exhibition of two or more analysts giving diametrically opposite results.

This is not the only day lost of late by the analysts. A grocer at Goole was prosecuted on the strength of Mr. Allen's certificate for selling adulterated mustard, and the certificate was as follows:—"The sample was a very peculiar one. The usual adulterations of mustard were absent. The sample had a disagreeable taste and smell and dark colour, distinct from those of pure mustard. The taste and smell resembled those of rapeseed and an oil (probably rapeseed oil) had been added to the mustard. I am unable to suggest any reason for such an addition, unless it was made to replace fixed oil of mustard previously removed. On distillation of the sample with water no appreciable amount of essential oil was obtained. I am of opinion that the sample was unfit for food." An analysis from another source stated that the mustard had evidently got spoiled by the addition of oily matter, probably accidentally admixed, and as a warranty was proved with the article the case was dismissed, there being no intention to impose on the public.

At Glasgow another grocer has been prosecuted for selling honey which contained a piece of honeycomb, surrounded by a syrupy substance, which was glucose, "a preparation of starch which had very much the appearance of dropped honey." The analysis of Dr. Clarke certified to the presence of 50 per cent. of glucose, and the grocer was fined accordingly. On chemical grounds it would be interesting to learn how Dr. Clarke can tell which is glucose and which is honey.

In a letter to the *Medical Times and Gazette* of October 20, Mr. Metcalfe Johnson calls attention to a case of poisoning by bichromate of potassium where a French polisher who took two scruples of the salt in mistake for a dose of medicine, and Mr. Johnson is of opinion that had it not been for the prompt measures taken, the case might easily have proved speedily fatal. This case possesses an increased interest now that public attention has been directed to the use of chromate of lead in colouring articles of food, such as American cured hams, etc.

Professors Macalister, Macnamara and Reynolds have recently issued a report on the question whether the flesh of cattle affected with pleuro-pneumonia should be used as food. The Dublin Sanitary Association has also reported on the subject, and has come to the conclusion that such flesh should not be used as food under any conditions, notwithstanding that it has been proposed to render it less liable to putrefaction by careful bleeding. The reasons assigned are that the disease is a specific contagious fever, affecting the entire system, including the flesh and milk, the flesh being particularly prone to putrefaction, that there is also no evidence of a scientific nature to prove that such flesh has not produced injurious results when taken as food.

Professor A. H. Church* has found in the watery extract of the leather scraped off the backs of some volumes from a public library a large amount of sulphuric acid derived from the combustion of coal gas in the library. He obtained the following figures:

	Per cent.
Free sulphuric acid in decayed leather .	6·21
Combined " "	2·21
Total " "	8·42

The injurious action of the products of combustion of coal gas upon leather bindings is well known, Faraday having called attention to the fact many years ago as explaining the destruction of the books in the library of the Athenæum Club, as Professor Church has done in the above instance.

Professor Albert B. Prescott† reports that he has succeeded in decomposing some metallic sulphates by hydrochloric acid. His method of operating consists in treating 1 gram of each metallic sulphate with 4·035 grams of aqueous hydrochloric acid containing 1·251 grams of HCl. (3·5 c.c. of acid of 1·153 sp. gr.) and evaporating to dryness in the water-bath.

The *Popular Science Review*, for October, contains, as usual, much matter of general interest to the scientific reader; the only paper, however, to which attention can be devoted here, is one by Dr. Walter Flight, on "Meteorites and the Origin of Life." It will be remembered that, some six years ago, Sir William Thomson suggested, in his Presidential Address to the British Association, that life on this earth was of meteoric origin. If the theory be accepted, that in the distant ages of the past the earth was a red-hot melted globe, it is necessary to account in some way or another for the existence of life, the history of which is at least contemporary with that of mankind; but although it is not impossible that the earth was itself a mere fragment broken off from a larger mass by collision, yet there is no proof of this, nor can it be said with certainty that it has ever existed in a red-hot state. But Sir William Thomson accepts the latter assumption, and endeavours to account for the widely existing fauna and flora of to-day. He supposes that, by collision of masses moving through space, fragments bearing seed or moss were broken off, and falling on this earth gave rise, by a process of evolution, to the circumstances of to-day. This theory did not only not escape scientific criticism at the hands of Zöllner of Leipzic, and others, but it received also public criticism, and caused not a little ridicule to be directed against science generally, for men said, even if Sir William Thomson's hypothesis be granted, the problem most desirable of solution is not solved, for there still remains the difficulty of understanding how life originated on those masses whose meteoric fragments are assumed to have innoculated this world with life. At the last meeting of the British Association (at Plymouth), Professor Allen Thomson also pointed out this difficulty, and made his observations the substance of a further communication to one of the sections. The discussion that ensued was, to say the least, funny, one speaker having expressed the wish that when Papa Colorado Beetle came down to the earth upon a meteorite he had left Mamma Colorado Beetle behind!

Dr. Flight proceeds to describe the general character of meteorites and their chemical composition, and it is curious to observe that nearly all analysts have isolated from them small quantities of a volatile and crystalline sulphurized hydrocarbon, melting at about 120° C. But reviewing the general results, it appears, from Dr. Flight's remarks, "there is not a particle of evidence to prove the persistence of living germs on meteorites during their passage through our atmosphere;" at the same time, from the composition of meteorites, it is not improbable that the original cosmical bodies from which they were derived may have borne on their surface some forms of organized beings.

In the *Quarterly Journal of Science*, for October, Mr. M. M. P. Muir gives a paper on "Scientific Method," and surprises the scientific reader by his opening sentence, which is as follows:—

"Whether we turn our attention on ourselves, or seek to pursue the study of mankind in general, or on the other hand, confine our view to the natural world around us, there is in each case one method, by pursuing which we arrive at exact knowledge: that method is the scientific." Further on, Mr. Muir says, "there is nothing peculiar in this method; it is but common sense reduced to rule." It must, however, be admitted there is something peculiar in Mr. Muir's paper, though that is not altogether common sense reduced to rule. The bulk of the paper is occupied with extracts from Jevon's 'Principles of Science,' and Charles Babbage's ninth 'Bridgewater Treatise,' as well as Thomson and Tait's 'Oxford Pamphlet,' and other works of erudition, together with observations naturally flowing from them. Any scientific man having read the paper would lay it down and be none the wiser, though perhaps the sadder, for having read it. Where Mr. Muir is correct he is writing what all workers in science know and feel; but he is not always correct, especially in the opening passage above quoted, for if we may accept the views put forward at Birmingham by Professor Tyndall, or those of J. Stuart Mill, the study of mankind and of society involves weighty considerations which cannot be dealt with by science.

The *Practitioner* for October contains a paper on the "Propagation of Scarlet Fever through the Agency of Milk." The outbreak in question occurred at New Barnet and, according to the paper referred to, it "was apparently caused by infected food, in this instance presumably milk." It is endeavoured to prove this in a way which has been attempted before, viz., by first of all assuming the milk to be the cause, and then showing that most of the sufferers were supplied by a certain milk dealer. Such a method is as illogical as the attempt to find out the true cause is commendable. The total number of cases which happened during the two months was 140, and of these 140 cases, 131 were supplied with the same milk. This certainly looks plausible, but against concluding that the milk thus supplied really carried the infectant, the following considerations must be borne in mind. The 131 cases of scarlet fever occurred in fifty-eight houses, but the same milk was supplied to seventy-seven houses in which there was no fever! Again, in houses supplied by other milk vendors nine cases of fever occurred. It is also seen that the one particular

* *Chemical News*, October 19, 1877.
† *Ibid.*

milk vendor whose milk was thus suspected had a considerable monopoly of the trade, and assuming the outbreak to have commenced in the district supplied by him, it would follow as a matter of course that the disease should be chiefly located in that geographical region. There is therefore no safe foundation—as yet no plausible ground even—for assuming that milk was here, or ever has been, the originating cause or the propagating agent of scarlet fever or any other disease.

"Does Vaccination afford any Protection against Small Pox?" is the subject of a pamphlet by T. B. Sprague, M.A., etc., reprinted from *The Journal of the Institute of Actuaries and Assurance Magazine.* The author attempts to arrive at a satisfactory conclusion by an examination of carefully compiled statistics, but he is baffled to some extent by their incompleteness. The general conclusion seems to be that with lapse of time there is a gradual wearing out of the protection afforded by vaccination. It should be mentioned that in this pamphlet the author, who is a spelling reformer, adopts the plan of spelling words according to their pronunciation, and as a result the pamphlet is interesting in more senses than one.

Dr. C. H. Ralfe has reprinted from the *Lancet* his paper on the "General Pathology of Scurvy," and among his inferences are these: that the primary change which occurs in scurvy is a chemical alteration in the quality of the blood, and that—so far as can be judged by analysis of urine passed by patients suffering from the disease, and analysis of what are considered to be "scorbutic," and "antiscorbutic" diets—this alteration points to a diminution of the alkalinity of the blood.

The high commendation given by Sir Henry Thompson to natural mineral water, as a medicnal agent of much greater efficacy than the salts contained in it are when prepared by the manufacturing chemist, has naturally contributed in no slight degree to increase the demand for the water of various mineral springs, enjoying a reputation for specific virtues. Among those kinds most in vogue with the ailing and medicine-loving public, the mineral water occurring on the banks of the Danube has lately become highly popular, and it is therefore worth mention that according to an article published in the *Pester Med. Chirurg. Press* by Dr. S. Hermann, the water obtained from different wells is not in all cases the same in character, though it unquestionably originates from one and the same source. He ascribes the difference to the infiltration of fresh water, which mixes with and dilutes the water of the true mineral spring, and he points out that by adopting suitable precautions this has been prevented in the case of the well bearing the name of Hunyadi Laszlo, with the result that the water obtained from it contains, according to the certificate of the official analyst of Pesth, a larger amount of salts than that obtained from other wells in the neighbourhood, and is in fact the richest water of this kind known.

Considering the cost of transporting mineral water from such a distance as Hungary, it is of course important to avoid, as much as possible, dilution of the true mineral water. Another mode of counteracting this obstacle to the general use of the water has been adopted, and an extract consisting of the salts dissolved in the natural water has been introduced into use in Hungary and Austria, which admits of being sold at a much cheaper rate than the corresponding quantity of the water, while at the same time presenting the saline constituents exactly in the same quantitative and qualitative proportions as in the original water.

Another contribution has been made towards the removal of the difficulty in the administration of medicines in proper doses, which has been repeatedly discussed in these columns. Messrs. Mawson and Swan have forwarded some samples of accurately graduated cylindrical glass measures, which they are about to manufacture for this purpose, holding one and two teaspoonfuls. From their size and lightness these measures are very portable and can be conveniently carried in the pocket by medical men.

It is satisfactory to note that various endeavours are being made to introduce into use the alkaloids so abundantly accompanying quinine in certain kinds of cinchona bark. In addition to the pure salts of cinchonidine and quinidine, made by Messrs. Howard and Mr. Whiffen, as well as the combined alkaloids manufactured in India, and in this country under the designation of quinetum, practical effect is being given to the recommendations of Dr. De Vrij that the entire soluble constituents of cinchona bark should be used. Thus Mr. Schacht's recently introduced alcoholic syrup of cinchona will serve to render usefully available as medicine, the total active constituents of the bark, and another excellent preparation, now introduced by Mr. Umney, under the name of fluid extract of cinchona, furnishing the constituents of bark in a very concentrated form, is an additional step towards obviating the waste of the valuable remedial powers of bark which has resulted from confining attention too exclusively to quinine. These applications of Dr. De Vrij's views are especially important now that Indian cinchona bark is becoming so considerable an article of commerce, though it is not so well suited for the manufacture of quinine. The testimony of various authorities to the medicinal value of the other constituents of bark besides quinine, is so decided that these efforts to provide for their administration are not only creditable to pharmacy but deserving of recognition.

ARSENICAL CAPPING PAPER.

BY J. B. BARNES.

There is in use a magenta-coloured capping paper which contains arsenic to a large extent. The colour of this paper is evidently the product of the oxidation of aniline by arsenic acid; it is very soluble, and I have seen an imperfectly corked bottle of medicine, which had been capped with this paper, coloured pink by its means. The paper in question is rose-coloured, has a smooth surface, and is very nice to use, being strong, thin, and pliable, but it loses its brilliancy when exposed to the light; it is, on that account alone, not the best which can be selected for the purpose, even if it did not contain a deadly poison.

It is needless to enlarge upon the danger attending the use of this paper, as the bare suspicion of extraneous arsenic finding its way into *medicine* must be sufficient to ensure its instant abandonment by those who have not already suspected that it contains arsenic.

THE TANNIC ACID OF GUARANA.*

BY FRANCIS V. GREENE, M.D.

Although guarana has been known in Europe since the year 1817, when it was described by Cadet de Gassicourt, it does not appear that any complete chemical analysis of the substance has as yet been made, or that the component parts have been examined with sufficient care to afford an explanation of its peculiar action on the economy, when used as a therapeutic agent.

The chemical investigations of Theodore Martius, in 1826, proved that it was not a gum-resin, as had been supposed, but a mixture of the seeds of the *Paullinia sorbilis* with starch, and that it contained a crystalline principle, which he styled guaranin, under the supposition that it was a new principle. The true nature of guaranin was not detected until 1840, when Berthemot and Dechastelus submitted it to an ultimate analysis, which established the fact that it was identical in composition to caffeina. Their very valuable researches on the subject (*Jour. de Pharm.*, 1840, p. 578) were, however, confined to the extraction and determination of the characters of the caffeine, and they merely refer incidentally to the gum, starch, tannin and oleaginous matters which exist in the guarana. The *Journal de Pharmacie et de Chimie*, vol. xxxix., 1861, p. 291, gives an extract from a note of M. Fournier in regard to an analysis he had made of guarana; but as it is only stated that he had found gum, starch, a fixed green oil, three volatile oils, a peculiar principle not fully determined, tannate of caffeine, and free tannic acid, without any reference to the relative proportions of the different substances, or the methods that had been employed to separate them, it can hardly be said that the analysis added anything of importance to what was already known in regard to the chemical composition of guarana. It is to be regretted that M. Fournier did not communicate his methods of isolating the different constituents, as an investigation of the physiological action of the component parts in a separate state might have afforded much information in regard to the value of the preparation as a curative agent. As far as I have been able to ascertain, no later chemical investigations of guarana have been made. It is possible, however, that Dr. Peckholt, who has examined a great number of the medicinal plants of Brazil, may have reinvestigated the subject and given the results in his work, 'Analyses de Materia Medica Brazileira.'

During an investigation lately made, with a view to the extraction of the caffeine from guarana, several of the reactions of the accompanying tannic acid were so strikingly dissimilar from those of the tannic acids in general, that I determined to isolate it and examine it carefully. For this purpose a quantity of guarana in fine powder was treated with successive portions of boiling alcohol (75 per cent.), the alcoholic solutions filtered when cold, and the alcohol driven off on a water-bath. The aqueous solution was then diluted with distilled water, and a slight excess of basic acetate of lead added, which threw down a voluminous flesh-coloured precipitate. This was thoroughly washed with distilled water, decomposed by sulphuretted hydrogen gas, and the sulphide of lead removed by filtration. The filtrate, after being heated on a water-bath to drive off the excess of sulphuretted hydrogen, and filtered, gave a clear solution with a scarcely perceptible tinge of yellow. Evaporated to dryness, this solution yielded an amorphous, slightly yellow, semi-transparent, partially scaly mass, which had the peculiar taste of tannic acid. This mass dissolved very readily in alcohol, and on allowing the alcohol to evaporate spontaneously, it was still found in the amorphous condition. That it is not incapable of crystallization, however, was proved by drying a small quantity of the aqueous solution over sulphuric acid under a bell-glass, when acicular crystals, radiating from amorphous centres, were formed.

The following is a brief description of the behaviour of this acid with different reagents:—

With ferric salts it gives a greenish precipitate, turning to brown on standing; with ferrous salts no precipitate is produced, but the colour of the liquid is changed in a short time to a dark green. The fixed alkalies give the solution a dark, reddish-brown colour; with ammonia it forms a lighter brown, while with lime water it gives a greyish-brown precipitate. It gives a green precipitate with acetate of copper, which is soluble in an excess of the precipitant. It does not precipitate the neutral sulphate of copper solution, but reduces the alkaline sulphate slowly in the cold, and rapidly when heated; it also reduces nitrate of silver by the aid of heat, and decomposes auric chloride in the cold. It gives dull white precipitates with barium salts (distinction from caffetannic acid), and a white precipitate with stannous chloride. It resembles caffetannic acid in not precipitating tartrate of antimony and potassa, and by readily precipitating both cinchona and quinia, but differs from it in precipitating gelatin from solution. Its reactions with the alkaloids and gelatin serve to distinguish it from catechuic acid. With lead acetate it gives a dull white precipitate. It quickly decolorizes the solution of permanganate of potash, and gives a dark red colour with molybdate of ammonia, which is discharged by oxalic acid.

It produces white precipitates with morphia and strychnia, and with aconitina and veratria with hydrochloric acid; it does not precipitate atropia, either in neutral solution or in presence of an acid. It gives no precipitate with salicin or santonin, but produces a bright yellow precipitate with piperina, in presence of hydrochloric acid.

As these experiments show that the tannic acid of guarana does not give reactions precisely similar to those produced by any other of the tannic acids treated with the same reagents, it is but reasonable to conclude that it differs from them somewhat in chemical composition, and it should on this account have some distinguishing appellation. It might very properly be termed *paullinitannic acid*, which would be preferable to guaranotannic, as future investigations may show the acid of *Paullinia cupana*, which is used as a diet-drink, and probably of other species, to be identical with that of the *Paullinia sorbilis.*

*From *The American Journal of Pharmacy*, August, 1877.

JAVA RHUBARB.*

BY PROFESSOR HUSEMANN.

Upon the Gunung Unarung and other mountains in Java there grows, at an elevation of two thousand to four thousand feet, a species of *Rheum*, the root of which forms an article of commerce, and is used by the Javanese as a purgative under the name of "*akar kelomba.*" Three varieties of this drug are met with in commerce: (1) *akar kelomba bras*, the top part of the root, with fragments of stalk still adhering; (2) *akar kelomba ketan*, the middle portion of the root; and (3) *akar kelomba keteba*, the bottom portion. Of the three the second named kind is the most valuable, whilst the top portion of the root combined with fragments of stalk is of the least value.

A detailed description of the best kind of Java rhubarb has been given by J. H. Schmidt in the *Tydschrift voor Nederlandische Inde* (xvii., p. 98), according to which the root is fleshy, and long conical, or somewhat napiform. In some places it is still covered with a dark-brown rind, whilst the remainder is peeled, and appears marbled with white and red. In a transverse section the rays run from the centre to the circumference, traversing the concentrical red-coloured rings, and appearing to break off at the cambium, which forms a dense dark-brown, resinous looking layer from 1·1 to 1·5 millimetres thick. The most central concentric rings are bright red and alternate with yellow ones. At the centre, in some fissures resulting from the drying, are seen some fine white felt-like

* From the *Pharmaceutische Handelsblatt*, No. 94.

threads, having a silky lustre; the structure of these can be recognized under the microscope. In a longitudinal section are seen in the centre the almost rectangular parenchyma cells, partially filled with chrysophanic acid. With the aid of a glass cells containing crystals of oxalate of lime can be detected.

The Java rhubarb resembles the Chinese in smell and taste almost completely; but according to some experiments made by Dr. v. Vogelpoel its activity is one-fourth less.

In 1874, Schmidt brought under the consideration of the Dutch East Indian Government the advisability of experimenting whether it was possible to increase the activity of this species of *Rheum* by cultivation, and thus to obtain a drug equal to the Chinese rhubarb but very much lower in price. The plant appears to be very abundant in Java, and the best kind of root, the *akar kelomba ketan*, is sold there at about 1*s.* 8*d.* per kilogram. As the therapeutic value of the Chinese rhubarb root increases, within certain limits, with the age of the plant, even if the experiment be carried out it will be some years before the result is known, but it would be possible in this way to secure roots of one age instead of a mixture of roots of all ages as at present.

The comparative analyses carried out by Schmidt between the official rhubarb and the best Java rhubarb show, however, some differences, and raise a doubt as to how far the Java root possesses the tonic properties of Chinese rhubarb.

In the first place the amount of ash differs. Calcined in a platinum dish the official rhubarb gave 12·15 to 12·24 per cent. of ash; the Java root yielded 6·27 to 6·91 per cent. A more detailed representation of the proportion of the inorganic constituents is given in the following table, in which unfortunately oxalic acid does not appear, the analyst having been prevented from completing the estimation:—

	Radix Rhei officinalis.	Radix Rhei Indicæ Javanicæ.
CaO	46·80512	41·68051
MgO	4·24359	5·26484
KO and NaO	7·35024	16·89486
CO_2	35·34188	19·25190
SO_3	1·11452	2·82191
PO_5	5·11709	6·78689
Cl	0·60683	2·09575
SiO_3	0·59828	1·97869
Carbon and Sand	0·76923	2·98934
	101·94678	90·76469

Schmidt has also attempted to estimate quantitatively some of the organic bodies which play a part in the therapeutic action of rhubarb; the result is shown in the following table:—

	Radix Rhei officinalis. per cent.	Radix Rhei Indicæ Javanicæ. per cent.
Rheotannic Acid	2·106	0·430
Phaeoretin	0·151	0·090
Chrysophan	0·056	0·107
Chrysophanic Acid	4·700	1·646
Emodin	0·580	2·000

From this it would appear that the rheotannic acid and the chrysophanic acid are present in the Java root in much smaller proportion than in the Chinese, whilst chrysophan and emodin are present in larger proportion in the Java root. Although the figures in this table cannot be taken as absolutely correct, in consequence of the great difficulty attending the separation of the organic constituents of rhubarb, it may be assumed that to a degree it is an expression of the differences between the two kinds of rhubarb. If chrysophanic acid be the active principle, then the inferior activity of the Java root depends probably upon the smaller quantity of chrysophanic acid present in it, and the activity might have been still further reduced if it were not for the simultaneous diminution in the proportion of tannic acid, which by its antipurgative action might act antagonistically to the chrysophanic acid. Professor Husemann considers it highly probable that the relative proportions of these constituents might be altered by cultivation so as to approximate the two rhubarbs more closely.

At present no information exists in botanical literature as to the plant from which the Java rhubarb is derived. Rosenthal's 'Synopsis Plantarum Diaphoricarum' does not refer to any species of rhubarb growing in Java. Still the Dutch East Indian botanists ought not to find any difficulty in deciding how far the plant should be treated as a new species or as one of the many continental East Indian species. But certainly this investigation throws no light upon the origin of the true rhubarb root.

THE RELATIVE VALUE OF COLCHICUM ROOT.*

BY THEODORE F. BECKERT, PH.G.

This subject was suggested by several pharmacists, who of late have found it a difficult matter to obtain colchicum root which on breaking presented a clear white colour. The recently imported article, as obtained from the wholesale druggists, consisted of tubers which had been sliced very irregularly. Out of a one pound lot not less than seven whole tubers were taken, the remainder varying from one-sixth to one-half inch in thickness. These pieces, when broken, presented quite a varied appearance, their colour being all shades between white and black; and it was noticed that the lighter coloured roots were mostly easy to break, and many of them of a mealy character, whereas the darker ones were difficult to break, and had a somewhat resinous appearance. A quantity of the root was broken piece by piece, and then separated into three grades, according to colour, white, slate-coloured and brown or blackish, particular care being taken in the sorting. Upon weighing, it was found that the white root constituted only one-sixth, while the grey root comprised not quite two-sixths, and the black root a little over three-sixths of the article examined. These results also agree with the observations of several resident pharmacists.

The methods used to determine were as follows: Two troyounces of each of the three grades of roots were exhausted by means of alcohol, yielding in each case about twelve fluidounces of tincture; these tinctures varied in colour according to the grade of root used, that from the white root being lightest. This indicates the solubility in the alcohol of the foreign colouring matter present in the grey and black roots. In preparing these tinctures, care was taken to percolate them under as similar circumstances as possible.

The tinctures obtained were separately evaporated by means of a water-bath, the residue was treated with distilled water, and poured upon a filter, in order to separate resinous matter; the filtrate was washed with slightly acidulated water until each filtrate measured 100 c.c. Dilute sulphuric acid was used for acidulating the solutions, which were volumetrically tested with Mayer's solution, in quantities varying from 5 to 15 c.c. In the preliminary experiments the solutions were variously diluted, and it was observed that the results were very considerably influenced thereby, an observation previously made by Dragendorff. To serve a sa basis for comparison, the experiments were afterwards made with solutions of uniform strength, as stated above, partly without any other addition, and partly as recommended by Dragendorff, after the addition of a concentrated solution of chloride of sodium, to increase the distinctness of the reaction. The three grades of the root required for 1 c.c. respectively ·0403, ·0414 and ·0462 of Mayer's solution.

Five troyounces of each of the roots were next exhausted by alcohol, percolation in each case being carried on until the liquid passed tasteless. The alcohol was eva-

* From *the American Journal of Pharmacy*, September, 1877.

porated, and the residues were treated with water, filtered and precipitated by a solution of tannin. These tannates of the white, grey and black roots, which, after having been dried, weighed respectively ·32, ·265 and ·27 gram, were decomposed by oxide of lead, and then treated with alcohol, in order to separate colchicia. The three alcoholic solutions were carefully evaporated to dryness, then placed over sulphuric acid for several days, and then their weight taken: the product from the grey root weighing ·115 gram, the black yielding ·104 gram, while the product from the white was unfortunately lost.

I next obtained some colchicum root from Professor Maisch, which was not less than ten years old, it having been in his possession at least nine years. It had quite a handsome appearance, very little dark root being present, and in all respects was a much better looking article than that previously employed. Two troyounces of this root were treated as stated above, and an acid solution obtained, measuring 100 c.c., and which, when treated with Mayer's test, in a similar manner as before, required ·0300 for the precipitation of 1 c.c.

The various results thus obtained are more concisely presented in the following table:—

	1st grade or white root	2d grade or grey root	3d grade or black root	Very old root
Mayer's solution necessary to precipitate 1 c.c. of the solution	·0403	·0414	·0492	·0300
Percentage of alkaloid in air-dry root	·205	·210	·219	·152
Tannate precipitate obtained from five troyounces of root	·320	·265	·270	
Amount of crude colchicia obtained from the tannates	lost.	·115	·104	

By the above table it will be seen that the results obtained with tannin and by Mayer's solution do not agree as to the amount of colchicia indicated. This may be due to the slight solubility in water of the tannate of colchicia, as noticed by Hübler and others, and to the varying amount of water used in the last experiments. But the results seem to indicate that it apparently matters little whether the root has a white, grey or black colour, but that the *age* is of primary importance, and none but a fresh-looking root should be purchased; if this is done I think no fault can be found as to the quality of the preparations made from it.

EXAMINATION OF COMMERCIAL COPAIBA.*

BY CHARLES A. BOWMAN, PH.G.

The author discusses the natural causes of the different appearance of commercial copaiba, which are due to its being obtained from different species of Copaifera, in thd probable mixture of the products of different species, ane in the loss or oxidation of the volatile oil from exposure. The principal varieties used in the United States are Maracaibo and Para copaiba, the former of which is a thicker liquid than the last. Specimens of both kinds were procured for examination from reliable houses.

Para copaiba yielded a clear solution with a small quantity of absolute alcohol and a slight flocculent precipitate with a large quantity. With little alcohol, sp. gr. ·817, a separation into two layers took place; but with a large amount no separation occurred, and the solution was nearly clear. Alcohol, sp. gr. ·835, gave in all proportions two layers, the lower of which was transparent, the upper cloudy. Agitated with half its bulk of ammonia, a perfectly clear solution was obtained. On evaporating a little from paper, a resinous spot without greasy margin was obtained, and when evaporated in a capsule 44·4 per cent. of a hard resin was left.

The Maracaibo copaibas behaved differently; they were cloudy and without flocculent separation with absolute alcohol; milky and without separation with little alcohol, sp. gr. ·817, and cloudy with more. They separated into two layers with alcohol, sp. gr. ·835, gave a permanent milky mixture with half the bulk of ammonia, left on paper a resinous stain with a greasy margin, and on evaporation from a capsule a plastic or soft residue.

The Para copaiba was then adulterated with, first, 30 per cent. of castor oil; second, the same amount of linseed oil, and, third, 20 to 50 per cent. of Venice turpentine. With these mixtures the following behaviour was observed:—

Tests.	Behaviour of First.	Second.	Third Mixture.
Alcohol, absolute . . .	Clear solution.	Clear solution.	Clear, with much alcohol flocculent.
Alcohol, sp. gr. ·817 . .	Slightly cloudy.	Separation; upper layer yellow.	Very slight separation.
Alcohol, Ammon sp. gr. ·835 . .	Separation when cold.	Separation, hot or cold.	Separation, hot or cold.
bulk ia water, half	Milky with 5 per cent. oil.	Milky with 5 per cent. oil; yellowish.	Clear solution.
Dropped on paper . .	Greasy margin.	Yellow greasy margin.	Well defined resin stain.
Boiled with water . .	Soft; with little oil, plastic residue.	Residue soft or plastic.	Hard resin.
Heat	Odour of copaiba, then of burning fat.	Odour of copaiba and of burning fat.	Distinct turpentine odour.
Petroleum benzin, 1 to 4 parts	Clear solution, even in presence of 2 oil to 1 copaiba.	Clear.	Dense floccules with 4 parts of turpentine.
Petroleum benzin, 10 to 12 parts	Separation, even with 10 per cent. oil.		Dense floccules with 4 parts of turpentine.

The oil separated from the first mixture indicates pretty nearly the exact amount of castor oil present, but little remaining dissolved in the benzin. The solution of Para copaiba in petroleum benzin was clear until about eight parts of the solvent had been added, when some floccules separated; the Maracaibo balsams gave clear solutions.

Experiments were also made with acids, oxidizing agents, various chemicals and solvents, without observing any distinguishing characteristic reactions; and though I have failed, as others have before me, to find a reliable test for the purity of the different varieties of copaiba, by which the presence of all adulterations could be detected, yet I may state that petroleum benzin, properly applied, will detect the presence of Venice turpentine, and not only the presence, but also very nearly the percentage, of castor oil.

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PROTECTIVE SANITARY LEGISLATION.

IF the value and utility of the Food and Drugs Act can be gauged by the extent to which the general public have manifested an appreciation of its objects, and availed themselves of the power of self-protection placed within their reach by its provisions, no other conclusion can be arrived at than one decidedly unfavourable to this measure. That this is the case is evident to any one who takes the trouble to note from time to time how prosecutions under the Act are instituted, and the fact is rendered still more patent by the recently issued annual report of the Local Government Board.

It appears from this report that, acting under the 19th section of the Act, the Board issued a circular letter requesting copies of the analysts' quarterly reports to be sent in. The reports thus collected have been subjected to careful examination, and as the result it appears that nearly all the samples referred to in those reports were procured by the officers appointed under the 13th section, so that the extent to which the Act has been enforced has depended mainly upon the action taken under that section, while section 12, which gives power to private purchasers to have samples analysed on payment, appears to have been comparatively but little used.

In some districts it is stated that a large number of samples have been submitted to analysis; in others no samples, or scarcely any, have been sent in any town to the analysts appointed there.

The reports from the Metropolitan districts show that 4177 samples of food have been submitted for analysis, out of which 515 were pronounced adulterated, and out of 110 samples of drugs only seven were found to be adulterated.

Omitting the cases of food, it appears that in Staffordshire out of 17 samples of drugs analysed, 8 were adulterated; in Surrey, 2 out of 3 samples of drugs were adulterated; in Warwick, 1 out of 5 samples; in Liverpool, 1 out of 3 samples; in Birmingham, 9 out of 25 samples; in Brighton, out of 6 samples none were found adulterated; in Bradford, 3 samples out of 6 were adulterated; in Salford, 11 samples out of 33; in Southampton, 5 samples out of 21; in Nottingham, the only drug sample examined was unadulterated; and in Sheffield, the 11 samples examined were all unadulterated. In reference to these cases and those of food, it is added that in a considerable number of them the extent to which adulteration existed did not appear to be such as to require that proceedings should be resorted to. In this enumeration of cases no mention is made of the number of cases that have been decided to be infringements of the law without adequate proof of adulteration, nor is any account given to show that in the cases not taken into Court the assumed adulteration could have been sustained.

These data furnish a very important practical commentary upon the outcry that was raised about the time the Food and Drugs Act was before Parliament as to the poisoning of the public with adulterated articles. At that time we ventured to express the opinion that there was no adequate foundation for many of the alarming statements that were made as to the prevalence of adulteration, and it is with much satisfaction that we find the working of the Act has itself borne testimony to the correctness of the views we then expressed.

From the report before us, we also gather further evidence of the absence of real interest in the Food and Drugs Act, for in many counties and boroughs it is practically disregarded. In Berkshire, Cambridge, Cornwall, Essex, Glamorgan, Nottinghamshire, Oxfordshire, and several other places for which analysts have been appointed, no samples, or scarcely any, have been submitted for analysis. It is, however, some consolation to find that the possibility which existed of making the public analyst a useful official has not altogether been lost sight of everywhere in the pursuit of the *ignis fatuus* of presumed adulteration. This is shown by the reference made in the report to the employment of public analysts to make analyses of water, which is mentioned as being an incidental advantage of their existence, though water is not within the scope of the Act.

Closely connected with the objects of the Food and Drugs Act are those contemplated by the Rivers Pollution Prevention Act, 1876, which gave new and very important powers to the Local Government Board, to Urban and Rural Sanitary Authorities, and to the general public, with the view of preventing the pollution of streams. This Act has for the first time rendered the pollution of streams a statutory offence, in respect of which the County Courts may make a summary order requiring the offender to discontinue the practice.

This is a matter affecting the health and well-being of the community, perhaps much more seriously than any supposed practices of adulteration, and it is eminently satisfactory to find that it has at length received effectual legislative consideration, and as the protection of our watercourses from contamination hurtful to health is a subject of interest to all classes, we give the following *résumé.*

According to the provisions of this Act, sanitary authorities are empowered, subject to certain restrictions, to enforce its provisions in regard to any stream within their districts, or passing through any part of them, and the expenses thus incurred in the execution of the Act are to be payable in the same way as those incurred in the execution of the Public Health Act, 1875.

In addition to this public action of the sanitary authorities, proceedings may also be instituted by individuals aggrieved by the commission of offences against the Act, except in cases where the offence is pollution of a stream by the liquid refuse from a manufactory, or the solid or liquid refuse from a mine. These cases are properly to be dealt with by the local authority, but if on the complaint of any person interested that body refuses to take action for the suppression of any pollution by a manufactory or mine, the Local Government Board is empowered by the Act to commence proceedings on receiving complaint from the persons aggrieved.

As regards the very important and frequent pollution of streams by the drainage of solid and liquid sewage material, by liquid refuse from manufactories, and by solid or liquid refuse from mines, the Act came into force on the 15th of August last, and among the provisions relating to such cases, the Act authorizes properly qualified inspectors appointed by the Local Government Board to grant certificates that the means used for rendering harmless any sewage or other noxious material discharged into a stream are the best or only practicable means under the circumstances of the particular case, and such certificates are to be conclusive evidence of the fact in all courts and proceedings under the Act.

The inspectors appointed for this purpose are Mr. R. Rawlinson, and Dr. Angus Smith, and a hope is expressed by the Board that the enactments above mentioned will conduce in no inconsiderable degree to the mitigation of the existing pollution of streams, as well as to its prevention in the future, and at the same time that these enactments may not be found to have imposed undue restrictions upon either the local authorities or the manufacturing and mining interests of the country.

As regards three main conditions requisite for the maintenance of a good sanitary state throughout the kingdom we may, therefore, congratulate ourselves that legislation has made some progress. There is evidence that the supply of food and drugs is not open to serious suspicion, the Alkali Acts have provided, to some extent at least, against contamination of the atmosphere by noxious gases; and the Act to which attention has just been directed will help to secure greater purity of our rivers and streams than has hitherto been attained.

A NEW FEATURE IN CO-OPERATIVE TRADING.

A Co-operative Stores Company (Limited), trading in the Edgware Road, announces in its price list the institution of a Medical Department, and that the Directors have made advantageous arrangements with a gentleman, who is a member of the Royal College of Surgeons, a Licentiate of the Apothecaries' Company, and a Fellow of the Obstetrical Society, to give professional advice at the Stores, or otherwise, at a fixed tariff. The tariff, which is subject to a reduction of 20 per cent. to members and their families and servants, includes a midwifery fee of one guinea and upwards. We commend this fact to the consideration not only of the newly formed Malthusian League, but also of the Medical Defence Association, as affording a fair field for the exercise of its protective energies.

THE ELECTION OF BENEVOLENT FUND ANNUITANTS.

The result of the election of Annuitants on the Benevolent Fund of the Pharmaceutical Society, held on Wednesday last, will be found in the official report on p. 334. It will be noticed that the number of voting papers received was less than last year, but it may be as well to state that this indicates no falling off in the interest excited by the election. Last year, papers representing votes to which voters were entitled as Members or Associates of the Society were issued separately from those accruing to them by virtue of subscriptions or donations to the Fund, so that in many cases two voting papers were sent in by one person. This year, in all cases where voters have been entitled to both classes of votes, they have been included in the same voting paper.

At present, however, it would be difficult to define very exactly the relative amount of interest in the two elections, as at the time of writing, two days after the election, voting papers are still being received by every post, and probably stragglers will make their appearance occasionally during the next fortnight.

We regret to have to add that one of the annuitants, Mr. Thomas Novis, elected in 1866, died on the 18th instant at the age of 75 years.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Council of this Association announces that arrangements have been made—dependent upon a sufficient number of students coming forward—to commence two classes for the study of Chemistry, in the first week of November. In one class, meeting on Tuesday evenings, a course of lectures on Theoretical Chemistry will be delivered; the other, meeting on Thursday evenings, will be devoted to "Practical Pharmaceutical Chemistry." Both these classes are to be conducted by Dr. Milne. A "Tutorial Class," for instruction in Arithmetic, English, and Latin, will also be conducted on Monday and Friday evenings, by Mr. A. Fairlie. Further information may be obtained from the Vice-President of the Association, Mr. J. M. Fairlie, 1, St. George's Road, Glasgow.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

October 17, 1877.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, and Taylor.

Dr. Greenhow was present on behalf of the Privy Council.

MAJOR EXAMINATION.

Six candidates were examined. *One* failed. The following *five* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Betty, Robert Brown ....London.
Blunt, Thomas Porter ....Shrewsbury.
Dear, Theophilus ....Hornsey Rise.
Nicholson, Richard ....Darlington.
Savory, Arthur Ledsam ....London.

MINOR EXAMINATION.

Twenty candidates were examined. *Ten* failed. The following *ten* passed, and were declared qualified to be registered as Chemists and Druggists:—

Barfoot, John Richard Doughty Chesterfield.
Clower, John........................Nottingham.
Corden, Frederick William W. Streatham.
Cousens, John Stather.............Hull.
Dyer, Edward Henry ....Horncastle.
Kendrick, Alfred ....Limehouse.
Richardson, Joseph ....Birmingham.
Robinson, John Edward ....Boston.
Russon, Henry Albert ....Birmingham.
Whitlock, Draycott Kelly ......Southampton.

MODIFIED EXAMINATION.

Three candidates were examined. *One* failed. The following *two* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bloxam, William Eagleston ......Oxford.
Fouraker, Thomas Edward .....Exeter.

October 18, 1877.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, and Taylor.

Dr. Greenhow was present on behalf of the Privy Council.

MAJOR EXAMINATION.

Six candidates were examined. *One* failed. The following *five* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Bayston, George Coryndon ......Guildford.
Cluett, Benjamin....................Kingston-on-Thames,
Fell, John James ....Lancaster.
Peirson, Henry ....Banbury.
Robinson, William Prior ....Waterloo.

MINOR EXAMINATION.

Twenty-one candidates were examined. *Fourteen* failed. The following *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bessell, James Walter...... .....Ludlow.
Davies, David ....Merthyr Tydvil.
Godsell, Philip George............Great Malvern.
Hugill, John Howden ....Edmonton.
Matthews, John Henry ....London.
Minshull, Rose Coombes.........London.
Stammwitz, Louisa ....Wandsworth Common.

October 19, 1877.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, and Taylor.

MINOR EXAMINATION.

Twenty-seven candidates were examined. *Twelve* failed. The following *fifteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Baker, Matthias ....Hanley.
Bell, John Waller ....Todmorden.
Billinton, Arthur ....London.
Bowness, William..................Wokington.
Clayton, John William ....Preston.
Cocksedge, George Bloomfield...London.
Cridland, Francis Edwd. John Devizes.
Halstead, Harry ....Blackburn.
Keith, John ....Forres.
Lakeman, Stephen ....Norwich.
Owen, Henry..........................Gravesend.
Roberts, David Prosser ....Hereford.
Savory, John Field ....London.
Sugden, Samuel.....................Newchurch.
Taylor, George ....Brinsley.

PRELIMINARY EXAMINATION.

The undermentioned certificates were received in lieu of the Society's examination:—

Certificate of the College of Preceptors.

Bray, Percy Dean.................

Certificate of the Faculty of Physicians and Surgeons of Glasgow.

Bryson, James ....Middlesborough.

Certificates of the University of Cambridge.

Coley, William Henry ....Wednesbury.
Pemberton, George William ...Blackburn.

Certificate of the University of London.

Haythornthwaite, F. Metcalfe...Kirkby Lonsdale.

Certificate of the University of Oxford.

Pridmore, Sydney Spencer ......Hinckley.

EXAMINATIONS IN EDINBURGH.

October 17, 1877.

Present—Messrs. Ainslie, Borland, Gilmour, Kemp, Kinninmont, Stephenson, and Young.

MAJOR EXAMINATION.

One candidate was examined and declared qualified to be registered as a Pharmaceutical Chemist:—

Gorrie, Daniel ....Perth.

MINOR EXAMINATION.

Eleven candidates were examined. *Two* failed. The following *nine* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bean, John ....Edinburgh.
Butters, Robert......................Leeds.
Carter, Henry Ayling ....Winchester.
Cowgill, Benjamin Rangdale ...Bingley.
Delamar, Edward Thomas ......Musselburgh.
De Nance, William Clarke ......Glasgow.
Fraser, Jonathan Innes ....Elgin.
Hammond, Henry...................Bradford.
Jones, Edmund......................Hanley.

October 18, 1877.

Present—Messrs. Ainslie, Borland, Gilmour, Kemp, Kinninmont, Stephenson, and Young.

MINOR EXAMINATION.

Ten candidates were examined. *One* failed. The following *nine* passed, and were declared qualified to be registered as Chemists and Druggists:—

Laing, Alexander Gordon ......Turriff.
Macdonald, Ewen..................Inverness.
Macdonald, John ....Edinburgh.
Mackirdy, John......................Glasgow.
McNaught, Louis Arthur.........Dumfries.
Paris, Walter ....Bathgate.
Plumer, William Cork............St. Albans.
Rohan, Robert Aldor ....Mauritius.
Smith, Charles Albert .... Leeds.

MODIFIED EXAMINATION.

Three candidates were examined. *One* failed. The following *two* passed, and were declared qualified to be registered as Chemists and Druggists:—

McLean, A. Leith Hay Adams...Aberdeen.
Milne, George ....Montrose.

GENERAL MEETING—BENEVOLENT FUND.

ELECTION OF ANNUITANTS.

A General Meeting of the Members, Associates in Business, and Associates of the Pharmaceutical Society, and of the Subscribers and Donors to the Benevolent Fund, was held at the house of the Society, 17, Bloomsbury Square, on Wednesday, October 24th, at twelve o'clock, for the Election of Six Annuitants.

Mr. John Williams, President, in the chair.

The notice convening the meeting was read.

Scrutineers were appointed, who examined the voting papers, and brought up the following report:—

Scrutineers' Report.

We, the undersigned Scrutineers, appointed at the thirteenth election of Annuitants on the Benevolent Fund of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting papers committed to us and report the following result:—

Bensley, George David	**1904**
Braithwaite, John Charles	**4901**
Gilbert, Edward	**1956**
Knight, Charlotte Elizabeth	1122
Naftel, Elizabeth	**2338**
Nichols, Mary	662
Parsons, Ann	**1980**
Short, Martha	**2462**
Whitehead, Annie	514

3557 voting papers were received, of which number 62 were informal, and were disallowed.

John Williams, *Chairman.*
T. P. Gostling.
John Robbins.
W. R. Atkins.
G. W. Sandford.
John Carr.
Matthew Pound.
Thomas Greenish.
William Cornell.
Ralph Rawlinson.
Charles E. Turner.

October 24, 1877.

The Chairman declared the following six duly elected Annuitants:—

Bensley, George David.
Braithwaite, John Charles.
Gilbert, Edward.
Naftel, Elizabeth.
Parsons, Ann.
Short, Martha.

Votes of thanks were given to the Scrutineers and to the Chairman.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

The annual general meeting of the Bristol Pharmaceutical Association was held at the Museum and Library, Queen's Road, Bristol, on October 1.

In the absence of the President, Mr. Boorne (whose health is unfortunately still impaired), Mr. Schacht was requested to take the chair.

The following report having been read, its adoption was moved from the Chair, seconded by Mr. Barker, and carried unanimously:—

"Report 1876–7.

"The report which the Council has now the pleasure to offer presents points of somewhat unusual interest to the members and associates.

"The arrangements long pending between the Council and the Committees of the Bristol Museum and Library, were brought to a fortunate conclusion about the end of last year. The details were explained in a circular which was immediately issued; but the Council would once more remind the members and associates that, in virtue of that arrangement, connection with this Association conveys the right to enjoy, within the premises, the entire resources of the museum and the library in Queen's Road.

"The Council of the Pharmaceutical Society of Great Britain, in reply to an application on behalf of this Association, most generously accorded it a double grant. This consisted of a valuable collection of drugs for the technical museum, and a sum of £50 for the purchase of books for the lending library. The former was placed in the hands of a sub-committee, consisting of Mr. Stoddart and Mr. White, for proper arrangement, and the money was handed to Mr. Schacht, with instructions for its disbursement.

"Messrs. Stoddart and White report as follows:—

"'The glass case for holding the materia medica collection is now in its place and ready for the specimens, many of which are deposited on its shelves. The dimensions of the case are 23 feet long by 8 feet high and 2 feet deep. The greater part of the shelves are placed in a sloping position, so that a better view may be afforded of the specimens. The remaining shelves are horizontal, for the reception of bottles and other preparations that must be kept standing upright. Our Bristol Association is greatly indebted to the parent society and other kind friends for the donation of various beautiful specimens, many of them of great rarity. Almost all are now ready for arrangement in the case, which, although a large one, is manifestly too small for a complete systematic series of materia medica. It has been therefore thought advisable to confine the samples to those drugs and chemicals most rarely met with, leaving the ordinary ones to be studied in the stock of ordinary business. Several rare and uncommon samples are already received, both of an organic and inorganic nature. The case, it is hoped, will soon be completely fitted up, and be a credit to the Bristol Pharmaceutical Association.'

"Mr. Schacht reports thus:—

"'The books enumerated in the list submitted to the Society were all ordered, and, with the exception of a few volumes in the course of publication, have been all purchased. I have still in hand £9 18*s.*, with which to pay for those already ordered, and such others as may be deemed useful additions to the list. The books, duly catalogued (a list of which is enclosed), have been placed in a convenient department of the Bristol Library, in Queen's Road, under the charge of its librarian; and the conditions on which they may be removed for home study are stated on the first pages of the catalogue.'

"The prize scheme of the Association for the past session was as follows:—Two prizes in Inorganic Chemistry; two prizes in Botany; three 'Hills' Prizes' in Materia Medica and Pharmacy.

"For the 'Hills Prize,' all associates of the Bristol Pharmaceutical Association were eligible who had not yet passed the Minor or the Modified; for the others it was required in addition that the candidate should have attended one of the systematic courses of instruction now open to him, either at University College, Bristol, or at the Mining School, in the subject in which he competed. The examinations were conducted by a committee nominated by the Council, and which consisted of Mr. Stoddart, Mr. Schacht, and Mr. White, and it resulted as follows:—

"*Chemistry.*—1st prize, £3 3*s*., Mr. Morris; 2nd prize, £2 2*s*., Mr. R. S. Cuff; extra prize, £1 1*s*., Mr. W. Stroud.

"*Botany.*—2nd prize, £2 2*s*., Mr. W. Stroud.

"*The 'Hills Prizes.'*—1st prize, £3 3*s*., Mr. S. W. Hall; 2nd prize, £2 2*s*., Mr. W. Stroud; 3rd prize, £1 1*s*., Mr. W. Powell.

"The course of monthly evening lectures for the past session was limited to three in number, but, being most kindly undertaken by gentlemen of high scientific repute in the city, they were full of interest, and attracted large audiences. The Council were careful to record their sense of obligation to Dr. Tilden, Mr. S. P. Thompson, and Dr. Letts, at the time of their lecturing and are glad to repeat it now.

"The number of members now enrolled on the books of the Association is fifty-three, and that of associates is thirty-three. These numbers compare favouraly with the experience of past years.

"The financial position of the Association will be seen to demand the special attention of the next Council, but in other respects the Association may be fairly congratulated upon its past work and its prospects for the future."

The financial statement showed that the receipts during the year had been, 53 members' subscriptions, at 10*s*. 6*d*., £27 16*s*. 6*d*.; 33 associates' subscriptions, at 5*s*., £8 5*s*.; total, £36 1*s*. 6*d*. The expenditure, including a payment of £5 14*s*. 10*d*., due to the Treasurer on the previous year's account, amounted to £47 9*s*. 4*d*., leaving a balance due to the Treasurer of £11 7*s*. 10*d*.

A ballot having been taken, the following gentlemen were declared elected as the Council for the current year:—

Mr. Stoddart, President; Mr. White, Vice-President and Treasurer; Mr. Tucker, Hon. Sec.; and Messrs. Berry, Boorne, Boucher, Pitman, Plumley, Schacht, Stroud, Towerzey, and Townsend.

Parliamentary and Law Proceedings.

Prosecution under the Pharmacy Act.

The Council of the Pharmaceutical Society of Great Britain *v.* Robert Hird.

This case was tried on the 17th instant, at Brigg County Court before the Judge, Mr. J. Stephen, LL.D.

Mr. Lucas, from the office of Messrs. Flux and Co., appeared for the plaintiffs. The defendant did not appear.

George Birkett proved that on the 7th April last, he went to the grocer's shop, kept by the defendant at Ashby, near Brigg, and asked for two pennyworth of white precipitate, and was supplied by the defendant with two packets, for which he paid two pence. The packets purchased he took to Mr. Thomas Couldrey, and left them with him.

Mr. Thomas Couldrey, M.R.C.S., proved that he practised at Scunthorpe, near Brigg. He received from George Birkett the packets produced, and subsequently tested the contents and found them to be ammoniated mercury, commonly known as white precipitate of mercury. The packets were labelled "Precipitate—Poison. From Spouncer and Son, Chemists, Gainsborough."

The Learned Judge gave judgment for the £5 penalty with costs.

Prosecutions under the Sale of Food and Drugs Act.

Adulterated Cream of Tartar.

At the Huddersfield Borough Police Court on Tuesday, October 16, Mr. Charles Oates, chemist and druggist, Longroyd Bridge, was charged with selling 4 ozs. of cream of tartar which was mixed with a certain material which affected injuriously its quality. The defendant, through Mr. Morrison, pleaded not guilty.

Mr. Kirk said that the information was laid under the 4th section of the Sale of Food and Drugs Act, which stated that any person who should sell any drug mixed with a foreign ingredient, so as to injuriously affect the quality, was liable to a penalty not exceeding £50. On the 5th of October he went to the defendant's shop and purchased 4 ozs. of cream of tartar, for which he paid 5*d*. He told the young man in the shop that he had made the purchase for the purpose of having the cream of tartar analysed, and asked if he would accept a part, and he said he would. Witness divided the cream of tartar into three parts—one he gave to the young man, one he retained, and the third he submitted to the borough analyst. In cross-examination, he said he bought 6 ozs. of spirit of nitre, but he did not put it to any test, and he had not yet got the analyst's certificate with regard to it. He did not know that the defendant bought his goods from a wholesale firm at York.

Mr. George Jarmain said he was public analyst for Huddersfield. On the 5th October he received a sample of cream of tartar, and he found that of 100 parts 97·6 parts were cream of tartar and 2·4 parts were ground heavy spar (sulphate of baryta). He was of opinion that the addition of ground heavy spar had been wilful, and that the same affected injuriously the quality of the drug. In cross-examination he said it was not at all probable that a foreign ingredient could get into the drug in course of preparation. He was of opinion that the foreign ingredient had been put in wilfully.

Mr. Morrison said the defendant had been a chemist and druggist for thirty-five or forty years, and had dealt with Clark, Bleasdale, and Co., York, wholesale dealers. In the month of February he bought from them 14lbs. of cream of tartar, and he had no reason to believe that it was not proper cream of tartar. The fifth section of the Act said that a person should be exempt from fine if he showed to the satisfaction of the justices that he did not know the drug had been mixed, and that he could not with reasonable diligence obtain that knowledge. The defendant would tell them that he had no knowledge that there was the slightest adulteration in it. He (Mr. Morrison) was instructed that the cream of tartar was not adulterated. The defendant said he did not know that the cream of tartar was mixed with any foreign ingredient. Had he known that he should not have sold it. He tasted the cream of tartar when it came, and it seemed all right. He further stated that he tried the cream of tartar and found a slight sediment at the bottom, but it appeared that he did not ascertain this until after the inspector had been to the shop.

The Bench said they thought the defendant had been guilty of a legal offence, and he would have to pay 20*s*. and the expenses.

Sale of Adulterated Sweet Spirit of Nitre at Co-operative Stores.

At the same Court Benjamin Parker, manager of the Co-operative Stores, Bradford Road, was charged with selling 6oz. of sweet spirit of nitre which was adulterated.

Mr. Armitage appeared for the defendant and pleaded not guilty.

Mr. Kirk said that on the 25th September he went to the shop in question and purchased 6oz. of sweet spirit of nitre, for which he paid 1*s.* 6*d.* He told the defendant who he was, and for what purpose he bought the material. He gave the defendant a part and he submitted another part to the borough analyst, who had given a certificate showing that of 100 parts 56 parts were sweet spirit of nitre and 44 parts were of water. The witness said he did not know there were two qualities recognized. The defendant told him he got the article from Mr. Dickinson, Kirkgate, and that they had been particular to sell nothing but what they believed to be genuine articles.

Mr. Jarmain said that the liquid was adulterated with water to the extent named in the certificate he had given. In cross-examination, he said he believed that the defendant had done his best to sell articles that were pure, but people should not sell articles which they did not understand.

The defence was that the society had discontinued selling certain articles, and the defendant had done his best to sell only articles which were pure. He had managed the shop for twelve years, and he did not know but that the sweet spirit of nitre was pure. It was sold exactly as it was supplied to the society. In cross-examination, he said he did not know that any water had been added to the sweet spirit of nitre. After further evidence, the Bench said it was necessary that they should make a mark, as it was very important that the people should have drugs of a pure nature. The defendant was fined 10*s.* and the expenses.

Fred. Sykes, manager of the Beehive Co-operative Stores at Paddock, was charged with selling 6oz. of sweet spirit of nitre, which was adulterated. Mr. Kirk stated that on the 5th inst. he purchased from the defendant (who was represented by Mr. John Thornton) 6oz. of sweet spirit of nitre. He gave the defendant a part and sent one part to the borough analyst, who gave a certificate showing that the liquid was made of 60 parts of sweet spirit of nitre and 40 of water.

Mr. Jarmain gave evidence as to the quality of the drug.

Mr. Thornton said the drug was purchased at Mr. Dickinson's, and was sold as it was bought. No water was added to the drug in their shop that he knew of, and they had no desire to sell any article that was not pure.

The Bench fined the defendant 10*s.* and the expenses, and expressed the opinion that they ought to give up selling drugs if they knew nothing about them. Mr. Thornton said he was inclined to agree with the Bench.—*Huddersfield Daily Examiner.*

Poisoning by Eye-Water.

An inquest was held on Tuesday, by Dr. Hardwicke at the Buffalo Head, Marylebone, on the body of James Dooley, aged 2½ years. Deceased had been under treatment for nine weeks for ophthalmia, medicine and a belladonna lotion for the eye being prescribed. The lotion was put in a large bottle by the dispenser at the Marylebone General Dispensary, Welbeck Street, but, according to the mother's statement, it was never labelled "poison." On Saturday morning the mother administered to deceased a dose from the lotion bottle, believing it to be the medicine bottle, there being a similarity in the bottles. The mother saw a great change come over the child and found out her mistake. and ran with it to the dispensary, where it was seen by Dr. Lendon, the medical officer, who gave an emetic. Deceased, however, got worse and died at ten the same evening, having been delirious nearly all day. The cause of death was poisoning by atropine. The dispenser of the eye-lotion would not admit that the word "poison" was not on the bottle, but after due inquiry the jury returned the following special verdict:—"That deceased was poisoned by atropine contained in an eye-water lotion, which lotion was given by the mother in mistake for medicine, and the death was from misadventure. The jury are of opinion that carelessness was shown by the dispenser of the eye-lotion in not affixing a label with 'poison' written or printed on the bottle, and that the bottle was not a proper one for a small quantity of lotion as prescribed."—*Standard.*

Poisoning by Strychnine.

An inquest has been held at Marrow, near Wisbeach, on a young woman poisoned by strychnine. It appeared from the evidence that deceased before her death had stated that her sister's husband was the father of her unborn child and had given her a powder. On the other hand the brother-in-law, who is in custody, asserts that he bought the strychnine to kill himself, because deceased had said that she was *enciente* by him, and that she snatched the poison from him. The jury found that deceased died from the effects of taking strychnine, but how it was administered there was not sufficient evidence to show.—*Bristol Times.*

Alleged Poisoning of a Child.

On Monday, A. F. Vulliamy, Esq., held an adjourned inquest, at Needham Market, on the body of Robert Hall, an infant aged seven months, who died on Saturday week.

Margaret Hall, the mother of the deceased, re-examined, said: I gave one of Steedman's powders to my other child, two and a half years, two or three days before I gave the half to the deceased. The elder child had been slightly sick, I believe from eating unripe grapes, without diarrhœa, and I gave it the powder in consequence. The sickness got worse. I called in Mr. Griffin, who attended him a couple of days, and then he got quite well. The deceased suffered very much from diarrhœa during his illness. I have several times before given Steedman's powders to both my children. They always caused the child to sleep more soundly afterwards, and slight diarrhœa the next day. The diarrhœa was such as would be caused by an aperient medicine.

Mr. Thomas Griffin, surgeon, Needham, re-called, said I have made a *post-mortem* examination of the deceased. I found patches of congestion in the stomach and inflammation in parts of the bowels, which in some portions had gone on to the extent of mortification. Remembering the symptoms of the deceased's illness I believe the condition I have described of the stomach and intestines was induced by the action of an irritant poison, and I believe that poison was the cause of death. In certain states of the system calomel in medicinal doses have been known to prove fatal, even in as small a dose as a quarter of a grain. This would happen in very exceptional instances. The state of the intestines could not have arisen from natural causes, because acute inflammation of the stomach and intestines as a disease is almost unknown. In the case of the deceased child there had been vomiting and diarrhœa, and that circumstance, combined with the condition of the bowels found after death, caused me to ascribe death to the action of an irritant poison. The change of food arising from the weaning may have caused some general disturbance in the child, but the symptoms I found could not have arisen from mere change of food.

Albert James Bernays, Professor of Chemistry at St. Thomas's Hospital, deposed to making an examination of the stomach and intestines of the deceased. He said: The stomach appeared to be perfectly healthy, and did not exhibit the slightest sign of inflammation. The same remark applies to the intestines, with the exception of a few occasional brown patches, which I have understood are very common in cases of dysentery and typhoid. All that could be obtained from the whole of the intestines only weighed 226 grains. This was as nearly neutral as possible to test paper, which could be accounted for by the chalk found in the contents of the intestines. There were a few yellow stains, too small in quantity to recognize their exact character. I have not been able to discover the presence of any of the so-called irritant poisons. I found a trace of morphia, but in quantity too small to weigh. By electrolysis I found the merest trace of mercury in the tissues, but not in the contents of the intestinal canal. From what I have heard from Mr. Griffin, I consider that it is more than possible that the greater part of any irritant poison would have been removed. I have analysed Steedman's soothing powders, and I know them to contain a small dose of calomel, but I have never heard the quantity. I do not think it amounts to a quarter of a grain. I never heard of half a grain of calomel causing death. Steedman's powders seem to be carefully prepared. I have examined them three times, and the result has been the same in each case. If I had not been told that the person died from an irritant poison, unless I had been ordered, I should not have thought it worth while to make an analysis, on account of the perfect healthiness of the stomach.

Mr. J. Wiggin, public analyst, made a report on the sample of Steedman's powders forwarded to him, which showed that the powder contained a small quantity of calomel, it was about 25 per cent. of the powder, but the quantity was too small to say exactly.

The jury, after a long consultation, returned a verdict of "Died from an irritant or irritants, but what or when taken the jury were unable to say." They desired to add the expression of their opinion that no blame attached to any one in connection with the death of the deceased.—*East Anglian Daily Times.*

PAPERS PRESENTED TO PARLIAMENT.

Report of the Warden of Standards.

The eleventh annual report of the Warden of the Standards, Mr. T. H. Farrer, on the proceedings and business of the Standard Weights and Measures Department for 1876–7, has just been issued, and an abstract of its principal points may not be without interest to the readers of this Journal.

The main business of the office is (*a*) the custody of the imperial standards of length and of weight; (*b*) the periodical verification of these primary standards; (*c*) the maintenance of exact secondary standards for official use; and (*d*) the periodical verification of the local standards used by the inspectors of weights and measures.

In carrying out that portion of the business included under the first two heads, during the past year the three "parliamentary copies" of the imperial standards, which are deposited severally at the Royal Mint, with the Royal Society, and in the Royal Observatory at Greenwich, were temporarily removed to the Warden's office from their places of deposit, and compared with the imperial standards and with each other. It was found that no change had occurred in the relative lengths of the imperial yard or of its three parliamentary copies since their original verification in 1855, and that no appreciable change had occurred in the relative weights of the imperial pound or of its three parliamentary copies.

The department has also to take care that the "Board of Trade standards" are duly compared with the imperial standards at least once in every five years. During this year the Board of Trade standards requiring such legal comparison were the gas-meters, the "fluid ounce" measures, the "liquid measures of grain weights of distilled water," and the "cubic inch" measures.

The use of weights of one-third and of two-thirds of an ounce avoirdupois was legalized by Her Majesty's order in council of 4th June, 1870, for foreign postal purposes, in consequence of the postal convention of 1869, by which the postage upon international letters was charged by a scale of ten grams, or one-third of an ounce. As this convention is no longer in force such weights are not now required.

The number of inspectors' standards verified or reverified during the past year is slightly below the average. It appears that several counties and towns have neglected to comply with the law and have not had their inspectors' standards duly reverified. The department therefore calls the attention of these counties and towns to such omission, as any conviction for using false weights and measures in these places would appear to be illegal.

The erection by local authorities of public standards of length, although recommended by the department in the last report of the Warden of the Standards, has not been carried out so generally as could be desired, owing probably to the large expense of standards of the form at first proposed. It is announced therefore that with the view of facilitating the erection of such public measures of length the Board of Trade is prepared to approve standards of much less cost and of lighter form than those exhibited at Trafalgar Square. To engineers such standards are of undoubted use. Sir J. Whitworth has always contended that available standards of length in the form of end-measure bars with plane ends should be placed in the care of corporate bodies in large cities, and should be accessible for the use of the public, and the convenience to land surveyors, tradesmen and mechanics of having public standards of length by which they may at any time test their chain, yard, and foot-rule measures, is evident.

The attention of the Board of Trade having been called to a public and official announcement by the municipal authorities of Dublin, declaring certain measures of length laid down on the floor of the City Hall "to be correct and opened for the verification of all measures throughout the country," it was deemed necessary in respect to this instance of "home rule" to call the attention of these authorities to the laws regulating weights and measures which authorize the Board of Trade only to verify standards for such purposes, although the Board of Trade fully appreciated the example set by that city in the erection of measures for public use.

The Government of Russia, through General Gloukhoff, having expressed its desire that the department should verify the Russian primary standards of length and of weight, the Board of Trade authorized such verification. By the Russian imperial ukase of November, 1830, it is enacted that the *sagéne* of seven English feet, divided into three archines, each *archine* being of twenty English inches, or fifteen *verchocs*, should be the Russian unit of measure.

The amount of accuracy obtained by different methods of weighing was well shown during the verification of a standard kilogram for the Norwegian Government. The kilogram was weighed both by Dr. Broch and at the Warden's office, and the observations of the weighings were reduced to a vacuum by Professor Miller's method, and also by that of Dr. Broch. The difference between the weighings of the kilogram by the two methods amounted to only 0·015 milligram.

To meet the requirements of modern science a balance is needed by which the weights of bodies may be determined most accurately and quickly. Professor Mendeleef, of St. Petersburgh, and Herr Bunge, Mechanicus, Hamburg, have shown that it is possible to weigh quickly and accurately by the use of a balance whose beam has much shorter arms than those now in general use. A practical test of the relative merits of a beam with long arms and of one with short arms has been made in the department. By this test as well as from the mathematical consideration of the question, it has been ascertained that whilst the probable error of a weighing made with the short-arm balance is slightly greater than the probable error of a weighing made with the long-arm balance, yet a weighing by the long-arm balance occupies twice as much time as one made with the short-arm balance. Consequently great economy of time is obtained by the use of a short-arm balance. Only those chemists, physicists, inspectors of weights, etc., who have sat for hours watching the motion of a pointer moving slowly over a balance index can fully appreciate this economy of time.

Professor Barff's process for preventing the corrosion of iron appeared to the department to be likely to prevent the oxidation of standard weights made of iron, and Professor Barff has undertaken to submit some specimens of iron weights to this process. It is intended to place these weights in the hands of some local inspector of weights and measures so that it may be ascertained whether iron standard weights thus protected could safely be used in place of the expensive bronze or brass standard weights at present used.

The department has been recently applied to by engineers for the weight of a cubic foot of water. The legal weight of a cubic foot of water depends on the interpretation of the Acts 5 Geo. IV. c. 74, ss. v. and xiv., and 22 and 23 Vict. c. 66, s. ii. By the latter Act the cubic foot is declared to weigh 62·321 lbs. when the water is of the temperature of 62° Fahr., and the barometer is at 30 inches. The weight of a cubic foot of water adopted in this country differs, however, from the weight of the cubic foot calculated in terms of the scientific units adopted in other countries, and further inquiry into this matter appears therefore desirable.

All weighings of standard weights in this department in which special accuracy is required are reduced to a vacuum, and such reduction necessarily involves the question of the volume of air displaced by the standard weight. The weight of the volume of air which would fill the metric measure of capacity of a litre, the unit of measurement in these calculations, taken at the temperature of 0° C., and under a pressure of 760 mm. and weighed at the Standards Office, has been found to be 1·2938146 gram. In ordinary air of the temperature of 62° F., when the barometer is at thirty inches, a cubic foot of air would appear therefore to weigh 531·33 grains.

In consequence of an application made last year by Mr. Brunel, the Commissioner of Inland Revenue, Canada, for information respecting Sikes's hydrometer, the legal instrument used by the revenue authorities in Canada as well as in this country for ascertaining the strength of spirits, some researches have been made at this office, with the view of ascertaining the correct indications of this hydrometer when placed in spirits of temperatures below 30° Fahrenheit. In Canada, where the temperature of the spirits to be taxed falls occasionally to 0° Fahrenheit, it is stated to be of fiscal importance that such indications should be known.

The annual trial of the pyx took place this year, as usual, at Goldsmiths' Hall, and the trial plates of gold and silver, together with the standard weights, were severally produced by the Warden of the Standards, as required by law, and were referred to by the jury then empannelled by the Queen's Remembrancer to test the accuracy of the coins of the realm, such testing being conducted with that care and attention to scientific details which so important an inquiry demands.

The testing of the coin by an improved method of weighing in air and in water, was referred to by the Queen's Remembrancer in his charge to the jury. The recent researches of the Chemist of the Mint show that it is possible to assay a coin most accurately without destroying it, as in the present method of assay.

The standard weights of the Royal Mint have been duly reverified, as required by law.

Although the Coinage Act, 1870, declares that all weights used for weighing coin shall be compared at this office, yet the number of coin weights compared here continues to be very small. This year only sixty-one coin weights have been stamped. Any one using a weight not so compared and stamped is liable to a penalty of £50.

In carrying out the duties of the department under the Sale of Gas Acts, the models of the standard gas measurers or gas holders sent in 1860 to the Lord Mayor of London, to the chief magistrates of Edinburgh and of Dublin respectively, in pursuance of sect. 3 of the Act 22 and 23 Vict. c. 66, have now been reverified by comparing them *in situ* with proper standards, sent for that purpose to each city, in charge of an officer of this department. The results of these comparisons were communicated to the authorities of these cities, with a statement of the error of each model, and an expression of the satisfaction of this department at the state of the valuable models thus committed to their charge. The Sale of Gas Act, however, makes no provision for the use of these models, and it is a matter of regret that such instruments should have been sent to these cities without some instruction as to their probable use.

During the visit of the officers of the department to the gas-meter inspector's offices, at London, Edinburgh, and Dublin, they had the opportunity of examining also the condition of the working standard gas-measurers used by the inspectors of these cities in the actual testing of gas-meters. It was found that in no case had these working standards been reverified since their original verification in 1860. The condition of the working standards issued to other places is probably similar. After a period of seventeen years, the errors of these working instruments may now be considerable, and the accuracy of any results obtained from them is doubtful. The attention of the department has been called by inspectors of gas-meters and others to the omission in the Sale of Gas Act to provide for the verification of their gas-measuring standards.

An important question brought under the notice of this department is the question of testing the index of a gas-meter. At present the inspector of gas-meters is not required by law to examine into the accuracy of the index, and consequently gas-meters are stamped as correct although the inspector's examination is a partial one. Three recent instances have been reported to this departmart in which consumers of gas were charged for gas much in excess of what they had consumed, owing, as it was subsequently accidentally discovered, to the inaccuracy of the index only. In one instance a "3-light" meter registered five times more than was really consumed; in a second instance a "300-light" meter registered three times more than was really consumed, and in a third instance, Mr. W. B. Davis of Torquay complains that his meter although stamped as correct had been found to register 86,000 feet in excess.

There is in the office a collection of ancient standards of the time of Henry VII. These ancient weights and measures are interesting, both as works of art and on account of their historical associations. It is proposed to transfer them to the South Kensington Museum so that they may become more accessible to the public view than they are at present.

The engraving machine, by which it was intended to engrave the official stamp of verification on measures of length and capacity instead of by the present rude method of impressing the office stamp upon them by a hammer, has become practically useless owing to the failure of the water company to deliver a sufficient pressure of water throughout the day to the turbine which works the engraving machine. The Office of Works cannot consent to the introduction of a gas-engine, and as no other motive power is available at present it appears impossible to introduce in this building this improved mode of certifying the inspectors' standards of length and capacity.

There have been presented to the department by Messrs. Thomas and Bryan Donkin several standard measures of length, formerly the property of the late Mr. Bryan Donkin, F.R.S. These standards are nine in number; they were placed in boxes specially fitted for their reception, and are valuable on account of their accuracy and of the expeiiments on expansion of metals made with them by the late Mr. Donkin.

Applications have been made by the India Department and by several hydrometer makers also to verify hydrometers, but although for its own purposes the department has provided itself with acurate hydrometers, it has no authority to verify copies of them.

The question of the contents of a sack of coke has been this year several times brought under the notice of this department. It has been already shown (*vide* 10th report) that the capacity of a sack varies in different localities. The size of a sack should depend on the construction of the Acts 5 George IV. c. 74. s. VII., and 5 and 6 Will. IV. c. 63. ss. VII., VIII., as to whether "heaped measure" is abolished or not. The gas companies who make coke sell it generally by "heaped measure." Three heaped bushels make a sack whose capacity is 8446·4661 cubic inches. The retail dealers appear generally to sell coke by "stricken measure." Three stricken bushels equal only 6654·576 cubic inches. This difference of capacity is considerable.

During the past year no question has arisen relating to the metric system of weights and measures. In this country the use of metric weights and measures in shops, etc., is illegal. The metric system, however, may by the Act 27 and 28 Vict. c. 117, be referred to in contracts and written agreements, and its use for scientific purposes by chemists and others is now almost general. This department has found it desirable, therefore, in aid of scientific research or otherwise, to maintain accurate weights and measures of the metric system.

The rude and antiquated method of teaching weights and measures in our schools has been referred to in previous papers of this department. It would appear, however, from present arithmetic books that the student may still be taught the particulars of weights or measures which can be of no possible use to him in after-life. The student may be taught, among many other useless terms, that 8 lbs. make a stone of butcher's meat, although the stone is expressly declared by 5 and 6 Will. IV. c. 63, to be equal to 14 lbs.; that cloth is measured by the Flemish ell which expired forty years ago; that the hide is a measure of land, although the hide was obsolete in 1701; that coal is sold by measure called the chaldron, although coal can only be sold by weight.

On the retirement of the late warden, the department was revised with the assistance of a committee appointed by the Treasury and Board of Trade, and it was arranged that the office of Warden of the Standards should no longer be held as a separate paid office, but should be associated with that of the Permanent Secretary of the Board of Trade. The business of the Standards Department has, in pursuance of the usual practice of the Board of Trade, been connected with one of the divisions of that office, viz., the Harbour Department, and the practical duties of this department are discharged by Mr. H. J. Chaney, who is in immediate charge of the standards.

Dispensing Memoranda.

[31]. In answer to the above I beg to say that a few days ago I dispensed a similar prescription to one under observation, of which I give a copy—

℞ Camphoræ . . . . ʒj.
Chloral Hydrate . . . . ʒj.
M. Ft. Lin.

Sig. To be applied with a brush as directed. I found that after reducing the camphor to powder by the addition of a little S.V.R., and rubbing well together, and placing in a phial, that it was some time before it became liquefied. I think "J. S. P." would be quite correct in using ʒj instead of ℥j camphoræ, as I do not see how ℥j could unite with ʒj of chloral to form a liniment.

J. N. C.

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[34]. I do not see any difficulty in dispensing the prescription as it stands. I suppose the stumbling block is the dose of hyd. bichlor., and should recommend the return of the prescription to the prescriber with a query.

FRANK ROOKLEDGE.

Easingwold.

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[36]. Can any one inform me the way to mix the enclosed receipe without separating?

ASSISTANT.

℞ Ol. Macis . . . . ʒj
Ol. Olivæ . . . . ℥ss.
Liq. Ammon. . . . . ℥iii.
Spt. Rosmar. . . . . ℥ii.
Aq. Rosæ . . . . ℥iv.
M.

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[37]. In dispensing the enclosed prescription should the double sulphate of the B. P. be used?—A. P. S.

℞ Aluminiæ Sulph. . . . . gr. ij.
Bismuthi Subnit. . . . . gr. ij.
Ext. Gentianæ . . . . q.s. ad pil.

Notes and Queries.

[558]. COPYING PAPER FOR PRODUCING WHITE LINES ON A BLUE GROUND.—Take 1. Red prussiate of potash, 120 grains, water, 2 ounces. 2. Ammonio-citrate of iron, 140 grains, water, 2 ounces. When dissolved, mix together, and filter. (This solution should be kept in the dark.) Now take some good note paper and give it an even coating of the above solution by means of a flat camel's hair brush. (This operation should of course be done by gas-light.) Then hang up the paper in the dark, and when dry it is ready for exposure to light, under a negative, tracing, etc., placed in a photographic printing frame.

G. W. WALTER.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE JACOB BELL MEMORIAL SCHOLARSHIPS.

Sir,—Not long ago an experienced examiner (I think it was Professor Huxley) made some useful remarks upon the character of questions proper for examinations. His observations went strongly against the system of "catch questions," which permit me to say are both a cause and a justification for "cram." My own experience of pharmaceutical examinations in the remote past does not altogether acquit them of this tendency, and I have observed a similar propensity in the published questions of later years. A year or two ago I called attention to the question put in a Preliminary examination paper "What is the plural of *die*?" and I asked *which* answer the examiners wanted, as they did not explain what "*die*" their question referred to. Probably the "lucky" answer would have been "*dice*," which I hold to be wrong, unless the word "*die*" is used in a limited sense, and this was not stated. I know that one candidate, who passed well up in the list, made the inexcusable mistake of taking the word for the Latin ablative for "*day*," which he rendered into its nominative plural "*dies*," but whether he scored off his blunder I never knew, as the examiners did not condescend to explain their meaning when appealed to. Neither does it appear that they have taken my protest much to heart, for I observed that the questions for the Bell Memorial Scholarship are of a similar "catch" character.

Agreeing with the views so well expressed by Professor Huxley, I think those questions generally too difficult, and calculated to throw the prize into the hands of the lucky rather than the meritorious candidate. Passing over the scientific and arithmetical questions, to which, however, my remarks equally apply, I take the difficult Latin passage from the first book of the Æneid,* difficult because separated

* See Journal, Oct 6, p. 273.

from its context and made still more perplexing by the presence of the extremely rare word "Cæsariem," which occurring at the beginning of a line and therefore spelt with capital "C" is calculated, and I should think intended, to "catch" the unwary. To the youth fresh from his Virgil the passage offers no difficulty; to a much better Latin scholar who happened not to have met with this identical passage it would most likely be fatal. Is that a proper characteristic of a test passage of four lines in which no opportunity is afforded of compensating for a misapprehension sufficient to spoil the sense of the whole sentence? It is no good to denounce "cramming" if our examiners adopt a system directly calculated to encourage it.

DETUR DIGNIORI.

PROSECUTIONS UNDER THE PHARMACY ACT.

Sir,—I sympathize with the closing remarks of your correspondent "M. P. S." in to-day's Journal in reference to the "over zealous" conduct of some analysts in their working of that Act, but I cannot in any case agree with him in the strictures he makes against the recent prosecution of unregistered men trading as chemists and druggists under assumed names. The two cases are very different. On the one hand, there is a staff of highly scientific men, who in most cases know little or nothing of the details of trade or of a manufacturing business, placed in a position, that with a stroke of their pen, a prosecution is instigated against perhaps the most respectable of business men, and in most cases without their knowing who the parties are. On the other hand, there is a class of usurpers, who are either too ignorant or too lazy (or both) to go forward and qualify themselves by passing the Pharmaceutical Society's examinations, carrying on a legitimate business; but must needs adopt some plan which will enable them to evade both the spirit and the letter of the law. The instance of the Apothecaries' Hall, given by "M. P. S." does not apply to the cases tried at the Birmingham Court. The Apothecaries' Hall is a registered and licensed place, or at all events the Company is so, and in the event of any accident occurring, the manager who is known to be a qualified person, is there to represent the Company. The same may be said of many old established firms in and out of London, who cannot be expected to change the title of the firm with every change in the partnership; but it is imperative and I think necessary, in common fairness to the great bulk of the trade, that such old-established firms should place on all poison labels, and on the door of their establishments, the names of the responsible managers, who, of course, must be qualified. Mr. Martin was the responsible manager of the business in question, and as such was he liable to prosecution, being unregistered himself. I think the officers of the Trade Association deserve the best thanks of the trade for their energy and perseverance in instigating and carrying through successfully prosecutions which ought long ago to have been carried through by the Pharmaceutical Society.

JAMES M. FAIRLIE.

Charing Cross Corner, Glasgow,
October 20, 1877.

COLOURED FIRES.

Sir,—The preparation of coloured fires has been attended with several severe accidents, and is, when sulphur and chlorate of potassium are included as ingredients, always accompanied with danger. Any one interested may, on referring to the back numbers of this Journal, see various reports of accidents arising from the mixing of red fire, even when apparently great care has been used.

But what especially impressed the danger of these mixtures upon my mind, was an explosion which occurred in this town some few years back, in the house of a firework maker, who had placed for extra security a quantity of firework cases containing a mixture of sulphur, sulphuret of antimony, nitrate of potash, and gunpowder in a closet in his bedroom, where during the hot summer night they spontaneously exploded, and in the furious fire that ensued some six or seven people lost their lives. In the inquiry which followed, it was proved pretty conclusively that the explosion was owing to the spontaneous ignition of the mixture above mentioned, probably accelerated by the unusual heat and disturbed state of the atmosphere.

This occurrence acted as a warning to have nothing to do with the mixing of fires containing sulphur, though possibly Mr. Walter's plan of washing the sulphur might somewhat reduce the chance of accident.

But why use these mixtures when the formulæ for coloured fires given in vol. ii., n. s., *Pharmacectical Journal*, and originally contributed to the Journal of the Chemical Society, by J. R. Bramschweiger, give better colours, yield no choking sulphurous vapours, and are free from the risk of spontaneous combustion?

For convenience the forms are here reprinted:—

Red Fire.

Nitrate Strontia	9 parts
Shellac in powder	3 ,,
Chlorate Potash	1½ ,,

Green Fire.

Nitrate Baryta	9 parts
Shellac	3 ,,
Chlorate Potash	1½ ,,

Blue Fire.

Ammonio-Sulph. Copper	8 parts
Chlorate Potash	6 ,,
Shellac	1 ,,

These have given great satisfaction for some time past, and I should strongly recommend them to the notice of your readers.

G. C. DRUCE.

Northampton.

Erratum.—On page 310, col. ii., line 19 from the bottom, *for* "oxalate of barium" *read* "oxalate of cerium."

"*A Country Assistant.*"—The preparation of the article in question is the subject of a patent, a copy of the specification of which may be obtained at the Patent Office, Chancery Lane.

F. G. Gough and W. H. Baldwin.—Your communications have been forwarded to the Publishers, Messrs. Churchill, 11, New Burlington Street, to whom all advertisements and payments for copies of the Journal should be sent.

J. S. Hicks.—The letter was considered unsuitable for publication.

F. H. Alcock.—*Polygonum Persicaria.*

A. P. S.—*The Sale of Quinine Wine.*—No licence is required for the sale of quinine wine, if made according to the B. P. formula and not sold as a proprietary or patent medicine. See before, vol. iii., p. 327.

W. Johnson.—(1) *Orobus macrorrhizus;* (2) *Petroselinum segetum;* (3) *Lapsana communis.*

W. Bray.—See a formula for Phosphorized Cod Liver Oil in the *Pharmaceutical Journal* for March 31st last, p. 808.

T. Lewis.—As a mere matter of individual opinion we should say that a stamp is required; but if you wish for an authoritative decision the best plan will be to apply to the Inland Revenue Board.

A. P. S.—Church's 'Laboratory Guide' or any other manual of analysis.

G. Taylor,—Apply to the Secretary for a copy of the pamphlet, 'Hints to Apprentices and Students.'

R. Watson.—The proof has been received.

H. W. Story.—The advertisement agents are Messrs. Churchill, 11, New Burlington Street, to whom we must refer you.

A Tamed Saxon.—We presume that the statement was the result of a slip of the pen.

"*A Chemist and Druggist.*"—In reference to your letter we do not think it expedient to discuss the merits of a case that is still pending; but if you were to communicate your suggestions to the persons conducting the defence of the case in question it is possible they might consider them useful.

COMMUNICATIONS, LETTERS, etc., have been received from Ms. J. L. Thomson, Mr. Reynolds, Mr. Williams, Mr. Evans, An Indignant Chemist, Assistant, Operarius, Mr. J. Laurie and Mr. Gostling are thanked for their communications, A. P. S.

SWEET SPIRIT OF NITRE.

What it Was—Is—And Ought to Be.

BY F. M. RIMMINGTON.

From the very unsatisfactory state in which I found the literature of this subject I have had to answer these questions for myself. And as some of the data and the facts I have made out may be of interest to others I presume to give them in this paper. In doing so I am fully conscious that there are some who may probably know more of the subject than myself. But my main hope is that I shall convince the trade and the medical profession that the spiritus nitri dulcis as at present ordinarily sold ought to be discarded from every respectable pharmacy as a worthless and useless preparation.

Spiritus nitri dulcis was introduced into English pharmacy some time in the early part of the eighteenth century, and it appeared in the London Pharmacopœia of 1746, the formula for its preparation being as follows:—

℞ Sp. Vinosi Rect. . . . M. Libras duas.
Sp. Nitri Glauberi . . P. Libram dimidiam.

M. Misce infundendo nitri spiritum alteri, et distilla leni calore, quamdiu, quod prodit, fermentationem cum sale lixivioso non suscitat.

The spiritus vinosi here ordered is by measure, as indicated by the small letter M, and the sp. gr. ·825, or of the strength of excise alcohol. The acid is by weight, and would measure less than five fluid ounces. With these proportions the operation is one of no little risk. The product is a highly ethereal fluid, of fragrant odour, and yellow colour, and yields 18–20 per cent. of nitrous ether.

The same formula was retained in the Pharmacopœia of 1788, with the modification that only twenty-six fluid ounces were to be distilled.

The difficulties and mishaps that would be frequently encountered in those primitive days of chemical science by the pharmacist, would neither be few nor trifling, and there can be no doubt that a strong reason was felt for an alteration of the formula. Therefore, in 1809, the Pharmacopœia ordered the acid to be reduced to three ounces, or one half, and only twenty-four ounces to be distilled. No other change was made until the Pharmacopœia of 1836 appeared, when the proportions of alcohol and acid were again altered to four troy ounces of acid, and three troy pounds of spirit. vini rect., sp. gr. ·838, and the distillate was to measure thirty-two fluid ounces, and have a sp. gr. not to exceed ·834.

The remarkable feature about this formula is, the fact that it was framed by a chemist of no mean reputation, and that the process is directed to be stopped just at the time when the chemical action, which is the object of the process, is about to commence. The result being that the product is little better than alcohol, and hence may have arisen the anomalous and unsatisfactory character this article has so long possessed.

The British Pharmacopœia of 1867 has attempted to restore this preparation to something like a respectable and useful position, as a therapeutic agent in the list of materia medica, but the process given is unnecessarily complex and probably does not meet with universal adoption. It does, however, fulfil one duty by specifying what the preparation ought to be, and gives three tests by which to determine its nature and quality.

Four or five per cent. of nitrite of ethyl, the quantity contained in the spirit of the British Pharmacopœia is, I think, a fair standard to adopt, and contains as much ether as can, perhaps, be conveniently kept without loss. This proportion of ether, too, is sufficient for all the medical uses required of it. Nitrite of ethyl contains about half its weight of nitrous acid and is easily decomposed when introduced into the stomach. It is easy to conceive the probable effects of such an agent in certain febrile or zymotic diseases. Its antiseptic power must be very considerable, but its diuretic properties are probably mythical.

Spirit of nitre when free from aldehyde and other oxidized products, will keep four or six months with but little change in bottles filled and well stoppered; any addition of water greatly accelerates decomposition, which may go so far as to annihilate all the ether.

I may, perhaps, be pardoned for pointing out one or two defects in the process of the present Pharmacopœia. The direction to suspend the process after twelve fluid ounces have distilled until the retort and contents have cooled, for the introduction of the second portion of the nitric acid, is quite impracticable on a larger scale. Supposing a manufacturer operating on ten or twenty gallons in an earthen still by means of a steam heat, it would require some hours for such an apparatus to cool a few degrees, and during this period of suspension, an active and destructive chemical action would all the while be in operation in the body of retort. Many compounds that are injurious to the purity and quality are generated under such conditions. The question may suggest itself to some, why has this article remained so long in so unsatisfactory a condition? I think, the answer must be, that tradition, prejudice, and the price at which it has been sold for so many years, have all tended to prevent any improvement in the quality being made. Any attempted improvement has been at once condemned and rejected, on one or other of the grounds I have named. The sooner this state of things is changed the better, or this agent, so venerable for its antiquity and respectable for the hold it has taken of the affections of the public and the profession, must ere long be consigned to oblivion.

NOTES ON MALTESE DRUGS.

BY ROBERT WATSON,

Apothecary (Malta).

The following are a few of the vegetable drugs in use in Malta. For the local names I am indebted to my esteemed friend Signor Guido Abela Pulis, of Valletta.

Ruta graveolens.—*Local name*, Feigel.

Used by the lower classes for abrasions and contusions. The leaves are powdered and mixed with olive oil and applied hot to the parts affected.

Borago officinalis.—*Local name*, Fidlokkom.

Used in infusion and syrup in cases of cough.

Hyoscyamus albus.—*Local name*, Mamma Zeiga.

Grows in great quantities in all uncultivated parts of the island. Used mixed with bread as a poultice in tumours on the breast.

MARRUBIUM VULGARE.—*Local name*, MARRUBIA BAIDA.

Used in infusion in cases of cough.

PAPAVER SOMNIFERUM.—*Local name*, XAHXIEH.

An infusion of the dried fruit is given to allay pain in young children. Many cases of death occur from its use.

MYRTUS COMMUNIS.—*Local name*, REHAN.

The leaves dried and powdered are used as violet powder in excoriation in young children.

PUNICA GRANITUM.—*Local name*, RORNMIERR.

An infusion of the peel of the root is used as an anthelmentic.

SMILAX ASPERA.—*Local name*, SALSA PAISANA.

A decoction of the root is used by the lower class as a remedy to cool the blood in skin diseases.

SAMBUCUS NIGER.—*Local name*, SEBUKA.

The boiled leaves are used as an antidote for erysipelas.

PLANTAGO MAJOR.—*Local name*, BISBULA.

This plant is to be found in cultivated parts during November. The lower superstitious class attribute imaginary virtues to it.

VERBENA OFFICINALIS.—*Local name*, BUKEX-RERN.

The boiled plant is used in cutaneous eruptions in children.

GLECHOMA HEDERACEA.—*Local name*, EDERA TERRESTRI.

The infusion of the leaves is used as a preventive against pectoral and other complaints.

SCILLA MARITIMA.—*Local name*, GHAUSAL.

This plant is very abundant on the island; the bulbs are exported.

THE TURPENTINES AND RESINOUS PRODUCTS OF THE CONIFERÆ.

BY DR. JULIUS MOREL,

Professor of Chemistry in the Industrial School, Ghent.

(*Continued from page* 283.)

VIII. BURGUNDY PITCH.

Synonyms.—L.: Pix Abietina. Gr.: Fichtentarr; Tannenharz. F.: Térébenthine de Bourgogne*; Poix des Vosges; Poix jaune; Poix blanche; Barras.

Botanical Source.—Abies excelsa, DC.

Picea, Plin., Hist. Nat., xvi. 10; Mathiol, Valgris., 107; Clus., Hist. Pl., 33.

Abies, Dodon., Pempt., 863.

Picea Latinorum, J. Bauh., Hist. i. 2, 238.

Picea major prima, sive *Abies rubra*, C. Bauh., Pin. 493.

Abies tenuioro folio, fructum deorsum inflexo, Tourn., Inst., 585.

Pinus Abies, L., Spec. 1421; Flor. Suec., 789; Fl. Lap., 347; Willd., Baumr., 221; Lamb., Pinet., ed. 2, i. 41, 27; Wahlenb., Fl. Carp., 312; Fl. Suec., 630; Fl. Lap. 256; Gaud., Fl. Helvet., vi. 191; Koch, Syn., 769; Aut. Conif., 90, t. 35, f. 2.

Pinus Picea, Du Roi, Obs. Bot., 37; Harak., ed. Pott. ii. 156; Endl., Syn. Conif., 116.

Pinus excelsa, Lam., Fl. Fr., ed. 2, 202.

Abies Picea, Mill. Dict., No. 3; Desf., Hort. Paris, ed. 3; Spach, Hist. Veg. Phaner., xi. 469; De Chambr, Tr. Prat. Arbr. Resin., 118, pl. i., f. 4, 5.

Pinus cinerea, Rocling, Deutschl. Fl., 376.

Abies excelsa, DC., Fl. Fr., iii. 275; Rich., Conif. 69, t. 15; Loud. Arbor., iv. 2293, f. 2212; Encycl. of Trees, 1026, f. 1922, 1923; Forb., Pinet. Wob., 87; Loisel, Nouv. Duham., v. 289, t. 80; Desf., Hist. Arbr., 580; Schonn. Ann. Sc. Nat., 3rd ser., iii. 239; Lindl. and Gord., Journ. Hort. Soc., v. 212; Knight, Syn. Conif., 36; Gord., Pinet., 3; Henk and Hockstli., Syn. der Nadelh. 136; J. E. Nelson, Pinæ, 47.

Picea vulgaris, Link., Abhandl. d. Berl. Akad. 1827, p. 280.

Abies Longoniana, Hort. Aliq.

Abies excelsa gigantea, Hort.

Abies Carpathica, Hort.

Abies rugosa, Hort.

Abies excelsa communis, Loud., Encycl. of Trees, 1026.

Abies excelsa nigra, Loud., l. c.

Picea excelsa, Link. in Linnæa, xv. 317; Carr., Man. des Pl., 343; Tr. Gén. Conif., 945.

E.: The Lofty, or Norway, Spruce Fir; Common Spruce; Prussian Fir.—G.: Gemeine rothe Tanne; Gemeine Fichte.—F.: Faux Sapin; Epicea; Sapin Pesse; Serente, or Scrinto; Sapin gentil; Pinesse; Sapin rouge; Sapin du Nord; Sapin de Norwége.

The *Abies excelsa*, like the fir, is a tree found in mountainous regions, where the atmosphere is humid, but it supports a lower degree of cold; it is also disseminated over a wider area towards the north and it attains in the mountains a greater altitude, which would doubtless be increased did not the dryness of the atmosphere interfere with its growth. It is abundant in the Jura and the Alps, rather common in the Vosges, and rare in the Pyrenees. If a certain degree of lightness and freshness be present it developes with an equal vigour upon the granitic or silicious ground of the Vosges and the calcareous soil of the Jura. It attains a height of 100 to 160 feet.

The bark is intermediate between fir bark and that of the pines. After the fall of the epiderm it presents a reddish and fragile suberous tissue, a green envelope in which can be seen resiniferous glandules, and the liber, which is composed of nacreous fibres, the oldest of these appearing to be transformed on the exterior into a hard and compact reddish cellular tissue. At the age of about thirty years an internal periderm is organized; this becoming dried causes all that covers it to fall off, producing a reddish suberous rhytidome that finally cracks and exfoliates on the surface in small superposed more or less rounded flakes, covered with fine pellicles that are constantly separating.

Extraction.—According to Flückiger, Burgundy pitch is produced in Finland, in the Black Forests, in the Grand Duchy of Baden, Austria and Switzerland. On the estate of Baron Linder, at Svarta, near Helsingfors, it is obtained by melting the crude resin in contact with the vapour of water, and straining. In the neighbourhood of Oppenau and on the Kniebis mountain in the Grand Duchy of Baden, the stems of the firs are wounded at equal distances by making perpendicular channels, one and a half inches wide, and the same in depth. The resin which exudes from these channels is scraped off with an iron instrument made for the purpose, and

* Under this name the Belgian Pharmacopœia describes a preparation obtained by melting white resin (galipot) with water, and filtering while hot.

purified by being melted in hot water and strained. This is performed in three or four small establishments at Oppenau and the neighbouring village of Löcherberg. In this state the resin, which is opaque and contains much moisture, is called *Wasserharz.* By a further straining and evaporating a portion of the water, its quality is improved.

The manufacture in that part of Germany is on the decline, partly in consequence of the timber being injured by the wounding of the trees, so that the collection of resin is not permitted in the large forests belonging to the Governments of Basten and Würtemberg. Flückiger has had the opportunity of observing that in the establishments in question, French turpentine, or galipot, imported from Bordeaux, as well as American resins or colophony, are used in quantities certainly exceeding that of the resins grown on the spot.

Characters.—Purified Burgundy pitch is an opaque resinous substance, yellowish-brown in colour, hard and brittle when cold but softening slightly in time and taking the form of the vessel in which it is kept. Its odour is strong, agreeable and aromatic, especially when it has been warmed, recalling then the odour of pine forests. The taste is sweet, aromatic, and without bitterness. Its texture is not at all crystalline, although it is not rare to observe the resin crystallized upon the branch of the tree.

Burgundy pitch is very soluble in glacial acetic acid, acetone, absolute alcohol, and even 75 per cent. alcohol; but its solubility is considerably modified when it contains water and essential oil. This character is sufficient to distinguish clearly between Burgundy pitch and the artificial product prepared with white pitch and water. The modification is more evident still when the resin contains much abietic acid. The same causes which modify its solubility influence its fusing point. The resin of *Abies excelsa,* freed from the essential oil it contains, and brought to the state of Burgundy pitch, when dissolved in one part of absolute alcohol, rotates the plane of polarized light 3° to the left. The essential oil rotates it 8·5° in the same direction.

Chemical Composition.—In 1864, Maly made an analysis of Burgundy pitch, according to which it is constituted, like most of the exudations from the plants of this genus, of an amorphous resin ($C_{44}H_{62}O_4$) and essential oils, represented by the formula $C_{10}H_{16}$. Burgundy pitch contains only a relatively small quantity of these essential oils; colophony contains none.

Uses.—In this country Burgundy pitch is used in the making of plasters; it forms the basis of Emplastrum Picis, B. P. Herlant properly observes that this product ought to be substituted for white pitch in the making of plasters, as the latter substance is a mixture of variable composition. In Germany it is much used, mixed with colophony and galipot, under the name of *Brauerpech,* for coating beer vats.

Adulterations.—Upon this subject Flückiger and Hanbury remark:—"No drug is the subject of more adulterations than Burgundy pitch, so much so that the very name is understood by some pharmacologists to be that of a manufactured compound. The substance commonly sold in England is made by melting together colophony with palm oil or some other fat, water being stirred in to render the mixture opaque. In appearance it is very variable, different samples presenting different shades of bright or dull yellow, or yellowish-brown. Many when broken exhibit numerous cavities, containing air or water; all are more or less opaque, becoming in time transparent on the surface by the loss of water. Artificial Burgundy pitch is offered for sale in bladders; it has a weak terebenthinous odour and is devoid of the peculiar fragrance of the genuine. The presence of a fatty oil is easily discovered by treatment with double its weight of glacial acetic acid, which forms a turbid mixture, separating by repose into two layers, the upper being oily."

In Belgium an artificial Burgundy pitch is prepared, to which the name "*poix blanche*" is given, by melting galipot with water, stirring the mixture and filtering while hot. In France this artificial pitch is also called "*poix blanche factice,*" and is obtained by melting a mixture of galipot and turpentine with water, stirring whilst hot, and after thoroughly incorporating the ingredients with each other the mixture is allowed to cool; or better still, the galipot, or pitch resin, is melted with a little oil of turpentine or Bordeaux turpentine. Guibourt recommends that the galipot should be replaced by colophony and the turpentine by oil of turpentine.

Guibourt mentions the following means of distinguishing this false pitch from the true Burgundy pitch. The resin which exudes from the *Abies excelsa,* either naturally or artificially, is colourless, at first semifluid and cloudy, and its odour has considerable resemblance to the Strassburg turpentine; but upon drying in the air it undergoes a singular change. Some parts remain white and soft, and preserve their citron-like odour, whilst others become reddish and take a peach-flower colour or that of wine dregs, similarly to asafœtida. The latter portions also contract a stronger odour, which without being disagreeable presents some analogy with that of castoreum. The whole melted together with water, as is done in all countries where the resin from the *Abies excelsa* is worked, gives an opaque pitch of a rather dark fawn colour. Its odour is quite characteristic, rather strong and balsamic; its taste is sweet and aromatic, not bitter. Apart from the impurities that may be present in this resin it does not dissolve completely in rectified alcohol, and although the quantity of insoluble resin is not very great, it is sufficient to distinguish it from the factitious pitch, which dissolves completely. The alcoholic solution of the natural pitch has a rather dark reddish colour, and it has a rather bitter taste, although the undissolved resin appears insipid.

The "*poix factice,*" which is obtained from the maritime pine is pale yellow, and its colour becomes blanched in proportion as it is beaten up with water. It readily becomes dry and brittle on the surface, and is less tenacious and less adherent than Burgundy pitch. It has a very marked bitter taste even when not dissolved in alcohol, and it possesses the strong and disagreeable odour of Bordeaux turpentine and its oil. It is entirely soluble in alcohol.

The true Burgundy pitch has a more pronounced and much more uniform irritant action than the false, which cannot replace it in any case. It is a very grievous substitution, depriving the medical practitioner of an efficacious medicament. For this reason the author has not followed the example of Herlant and made a special article of the false Burgundy pitch, which is recommended only in some very rare pharmacopœias and these of ancient date.

With the false Burgundy pitch may be connected the boiled turpentine, still known under the name of "Greek pitch" of the ancients, "yellow resin," "pitch resin," and according to Lemère, "colophane de 1ere sorte." It is obtained by stirring colophony melted with water, or, preferably, stirring with water the residue of the distillation of turpentine before it has lost the whole of its essential oil; lastly, by boiling a mixture of galipot or turpentine with water until the mass becomes solid and whitish.

It will be seen that this product approaches the false Burgundy pitch in its composition and it is only when it has been prepared from turpentine that it contains a large quantity of the essential oil.

This pitch resin is solid, variable in consistence according to the temperature, yellowish in colour, opaque, and has a more or less pronounced odour of Bordeaux turpentine, that turpentine being most frequently employed in its preparation. It is a preparation no longer met with in modern pharmacies.

XI. GALIPOT.

Synonyms. — Garipot, Barras, Torche, Résine blanche, Résine commune, and Encens marbré, when the source of the galipot is the *Pinus maritima*, Poir., *Pinus sylvestris*, L., or the *Pinus Laricio* of Europe; and Serape, Common Frankincense, Gum Thus, Thus Americanum, Thus vulgaris, when it is yielded by the *Pinus australis* or *P. Tæda* of America.

Botanical Origin.—This substance is yielded by the different pines which give common turpentine.

Extraction.—In the Landes department galipot is collected just as the turpentine working for the summer is finished. The oleo-resinous juice, much impoverished, still runs from the latest wounds, but as the temperature is not sufficiently elevated to cause the resin to run down quickly to the foot of the tree, or because the essential oil is present in it in less quantity, it dries in the air on the trunk from the incision to the base, forming upon the tree a white nacreous substance in stalactiform tears. It is collected in winter. According to Mathieu, "galipot" is the matter solidified along the squares, and which is detached in pieces without being mixed with the *débris* of the bark. The name of "barras" is specially reserved for the solidified and adherent matter that cannot be obtained without scraping, and which is only an impure galipot, mixed with chips, fragments of bark, etc.

Characters.—In commerce galipot is met with in solid masses, yellowish white in colour, of a granular texture, and having a strong and terebinthaceous odour and a bitter and aromatic taste. Its granular texture is explained by the presence of small crystals of abietic acid, quite visible under the microscope. This galipot is completely soluble in alcohol.

The American galipot, the common frankincense or gum thus, consists of soft or solid masses, yellowish or slightly greenish yellow, resembling in this certain American elemis. Its odour and taste recall those of *Pinus Tæda* and *P. australis*. It, also, is entirely soluble in alcohol. Pine leaves, chips of wood, and other impurities occur in it, so that it requires to be filtered before being used. By keeping it becomes dry, brittle, darker, and less strong in odour. Examined under the microscope crystals of abietic acid may be discovered in it.

Chemical Composition.—Galipot is very poor in essential oil, either because the oil evaporates during the exudation, or because it becomes resinified; and probably also because at the period of its exudation the essential oil is less abundant in the tree than during the time the tree is worked for turpentine. When galipot is soft, and consequently richer in essential oil, it is not dried in the open air, but it is distilled with water, and the essential oil thus obtained is known as "*huile de rase.*" The odour of this oil is more aromatic and not so strong as that of oil of turpentine; the oil is less esteemed by painters, but without the cause being known.

Uses.—Galipot is employed in the preparation of some plasters. In Belgium it is very rarely used. Formerly, common frankincense was employed in English churches as a substitute for more expensive incense.

XII. PITCH.

Synonyms.—E.: Black Pitch.—L.: Pix sicca, vel solida, vel navalis, vel vegetabilis; Arida Pix. —G.: Schiffpech; Schwarzes Pech; Schusterpech.—F.: Poix noire; Poix navale des anciens.

XIII. WOOD TAR.

Synonyms.—L.: Resini pini empyreumatica; Terebinthina empyreumatica; Pix liquida.—G.: Flussiger Theer. Holztheer; Fichtentheer.—F.: Goudron de Norwége; Goudron Tare; Brai liquide; Pissa; Goudron végétal; Poix liquide.

XIV. JUNIPER TAR.

Synonyms.—E.: Cade Oil.—L.: Pyroleum Oxycedri; Oleum Juniperi empyreumaticum; Oleum Cadinum.—G.: Cade Oil.—F.: Goudron de Cade; Huile de Cade.

The last-mentioned three products,—especially pitch and wood tar, are so admirably described in Flückiger and Hanbury's 'Pharmacographia,' a work probably within reach of most English pharmacists, that the author does not think it necessary to repeat the description here.

(*To be continued.*)

NOTE UPON A REACTION OF EMETIA.*

BY FREDERICK B. POWER.

Towards the many reagents commonly employed for the ready recognition of the principal alkaloids, by means of which their presence and identification may be unmistakably proven, emetia seems to maintain a neutral character, and independent of its emetic properties, and of the characteristic sparing solubility of its nitrate, no reaction has been observed by means of which its presence could be readily identified in the course of forensic analysis.

Although probably never having met with an intentional criminal application, yet in view of the frequent and extended application of ipecac root, a marked reaction of its active principle seems deserving of notice, especially as reliance upon physiological experiments might possibly lead to its confusion with veratria, which possesses equally powerful emetic properties.

Chlorinated alkalies, which were proposed some time since as a test for morphia, and the behaviour of a solution of chlorinated lime toward morphia and some other alkaloids and neutral principles, more recently examined by Wellcome,† afford with emetia a reaction which is apparently characteristic of this body. While most of the alkaloids examined by Wellcome were found to

* From *The American Journal of Pharmacy*, August, 1877.

† *American Journal of Pharmacy*, vol. xlvi., No. 7, page 305–7.

assume a reddish coloration with a solution of chlorinated lime—and to the number of these, according to Dragendorff, may be added physostigmia—it was observed that a solution of chlorinated lime produces with emetia a bright orange or lemon yellow coloration, and is conveniently employed by touching a trace of the alkaloid upon a porcelain plate with a drop of the alkaline solution; the reaction being much favoured by the addition of a drop of acetic or other weak acid, to insure the liberation of the hypochlorous acid, upon which the reaction apparently depends, as chlorine is incapable of producing the coloration, which is permanent and may be quite indefinitely retained.

A few drops of a solution of one part of emetia in 1000 parts of water, when evaporated to dryness and brought in contact with a drop of the alkaline solution, readily produces the coloration; and with a solution containing one part of the alkaloid in 5000 parts of water the yellow coloration is still perceptible.

In view of the isolation of the alkaloid when mixed with complicated organic substances, it must be remembered that it is not absorbed from acid, but very readily from alkaline solutions by amylic alcohol, chloroform, benzol and petroleum benzin.

The reaction may also be employed as a means of testing the value of various species of ipecacuanha. If a gram of the root of *Cephaelis ipecacuanha* in fine powder, or the cortical portion therein contained, be treated according to the process described by Professor Flückiger,* for the isolation of emetia, *i. e.*, mixed with a small amount of quicklime and a few drops of water, the mixture allowed to dry upon the water-bath, subsequently exhausted by chloroform, and the filtrate allowed to evaporate in a capsule containing a few drops of dilute acetic acid, the nearly colourless residue thus obtained affords with the alkaline solution the characteristic coloration.

The root of *Richardsonia scabra*, Lin., or undulated ipecacuanha, which is occasionally quoted as a source of emetia, when similarly treated does not produce this reaction, and which may confirm the supposition already entertained, that this root is destitute of alkaloid.

COMMERCIAL DRUGS OF THE CHINESE PROVINCE OF KUANG-TUNG (CANTON).†

BY DR. F. HIRTH DU FRENES, OF AMOY, CHINA.

(*Concluded from p. 88.*)

In reference to *Galangal* or *Galgant* root, it may not be out of place to remark that its botanical source has been ascertained only a few years ago by Dr. H. F. Hance, English vice-cousul in Whampoa, and probably the greatest living authority on the flora of Eastern Asia. He found specimens of the plant in the neighbourhood of the city of Hai-an-so, on the south shore of the peninsula Lei-chou, which runs out towards the island of Hai-nan. The results of his investigations were published in the 13th volume of the *Journal of the Linnæan Society*.‡ According to these, the plant is a new species of Alpinia designated as *Alpinia officinarum*, and is found native in Kao-chou-fu, in the district Hsü-wen (situated in the most southern part of the peninsula), and upon Hai-nan. A Chinese work on the geography, products, etc., of this district, entitled, "Kuang tung hsin-yü," or "New Reports on Canton," contains the following passage on *galangal:* "The root of this plant resembles ginger, and is used as a drug; the seed occurs in the market under the name of 'red cardamoms' (hung-tou kou-tzu), and is said to have purgative properties, when eaten in an unripe state. The natives use these red cardamoms pickled in sweet sam-shu (a Chinese rice- or fruit-wine), as condiment for meats or fish. Towards the end of winter, that is, in January and February, the seed looks like a piece of amber, has a bitter aromatic taste, and forms a grateful addition to chopped meat. The root is not used as food, but only as medicine; hence it bears a name different from that of the plant."

The list of commercial drugs which form important articles of exportation, is, according to our showing, not very large; but the home-trade in domestic products is exceedingly active and extended. Among these, *sugar* undoubtedly occupies the front rank, although the market of Canton cannot bear comparison, in this respect, with those of Swatow, Amoy, and Takow.

Plantations of sugar-cane are found along the shores of nearly all the rivers of the province, chiefly along the Eastern River; and in the districts of Pan-yü (Eastern Canton), Tung-Kuan and Tseng-cheng, nearly 40 per cent. of the arable soil is planted with sugar-cane. In the centre of this region lies the city of Shih-lung (or Sheklung), which is the principal market for this industry. Another important sugar district extends along the shores of the small river Mo-yang, which empties into the sea opposite the island Hai-ling-shan. In the district of Yang-chun, which occupies about the middle course of this river, where it flows through a fertile valley between low mountain chains, six-tenths of the cultivated soil are made to produce sugar.

Next to sugar *betel* deserves particular mention. The areca-palm, from which betel is obtained, is found abundantly upon the island of Hai-nan, upon the opposite peninsula of Lei-chou, and in the department of Lien-chou-fu, which extends along the northern shore of the bay of Tung-King (Tonquin). The betel produced in the district of Hui-tung, at the west coast of Hai-nan, is considered the best; next to it is said to rank that coming from Lo-hai.

The neighbouring sea furnishes *Agar-Agar*, a gum-like mass obtained from a species of algæ, which is used for sizing and calendering paper and silks, for giving a transparent coating to the gauze-covering of lanterns, and many other purposes. It is principally collected by the fishermen of Hui-tung (at the seaport Sha-lao), on the east coast. Upon the small rocky islands of the south coast, near Ai-chou are obtained the well-known *eatable swallow-nests*, and large quantities of shells, often of great beauty and rarity.

* 'Pharmacographia,' page 335.

† From *New Remedies*, August, 1877.

‡ *Journ. of Linn. Soc.*, 1873, 1.

THE ACTION OF CICUTA VIROSA AND SOME OTHER POISONOUS PLANTS.*

The most poisonous part of the plant, according to Trojanowski, is the root. The ethereal oil contained in this has no poisonous action, but the activity appears to reside in certain bright yellow drops contained in the resinous cortical zone, and from this a homogeneous, tenacious, non-drying amorphous highly poisonous resinous material can be obtained. Two or three milligrams are sufficient to poison a frog, and a cat is killed by the intravenous injection of ·007 of a gram. It is proposed to name it "Cicutoxin." It is absorbed slowly, the symptoms only appearing after twenty minutes, and sometimes not till after the lapse of several hours. The mode in which it gains entrance into the blood when ingested is not clear, since it is insoluble in water. In medico-legal cases, where no part of the structural elements of the plant can be discovered, it may still be possible to obtain sufficient of the resin by macerating the stomach in ether to make a physiological experiment on a frog. The actions of cicutoxin are remarkably similar to those of picrotoxin (from the *Anamirta cocculus*), of coriamyrtin (from *Coriaria myrtifolia*), of the resin of digitalis and taxus, and those of the baryta salts. These collectively form the so-called "group of

* *Der praktische Arzt*, June, 1877. From the *Practitioner* for September, 1877.

convulsive poisons." They act as violent excitants of a limited region of the medulla oblongata near the apex of the calamus scriptorius; of the convulsive centre discovered by Heubel in the frog, the existence of which has also been demonstrated by Nothnagel in mammals, and also to some extent to all the other centres situated in the medulla oblongata. The general symptoms produced by these poisons are well shown by the injection of a small quantity of cicutoxin beneath the skin of a frog. After twenty minutes the hind legs become stiff, the thighs are thrust out at right angles to the body, and the toes separated. The respiratory movements are much accelerated (irritation of the vagus centre), and owing to the inspiratory acts preponderating over the respiratory, the abdomen is blown up; whilst in consequence of the convulsive contraction of the abdominal muscles the air is forcibly driven through the contracted glottis with a very characteristic shriek. Tonic-clonic contractions of the muscles generally now supervene, the respiration is arrested, the movements of the heart are retarded, and death occurs with general paralysis after some hours or days. In mammals, after a period of restlessness of variable duration and abundant flow of saliva, the respiratory movements become more rapid and deep, and soon the most violent tonic and clonic convulsions of the voluntary muscles set in, during which the respiration is stopped by tetanus of the diaphragm, the cardiac beats are rendered much more energetic, and in the height of the attack are, with the circulation, brought to a standstill. The urine and fæces are expelled with convulsive violence. The attacks occur with increased frequency, and the animal dies exhausted from inadequate respiration. During the whole period the reflex excitability is enormously increased. Dr. Planat has suggested the employment of picrotoxin in the treatment of epilepsy. He commences with small doses and gradually increases them. In twenty-two cases thus treated more or less complete cures were effected.

THE PREPARATION OF DIALYSED IRON.*

BY E. B. SHUTTLEWORTH.

As there appears every probability that dialysed iron will become quite popular, at least for a time, a few practical directions, unincumbered by unnecessary facts or speculations, may serve a useful purpose.

Many methods and modifications of methods have been proposed for obtaining the solution for dialysis, and most of them may be followed successfully. The object is to prepare a solution tolerably concentrated, fully saturated with ferric hydrate, and containing as little acid as possible. I shall describe two methods, each of which has its peculiar advantages. Where time is not an object, as far as the duration of the process is concerned; and also in point of economy of labour and materials, the first may be adopted. Where it is desirable to produce a solution that may be finished quickly by dialysis, the second process has the advantage, and, taken altogether, I believe it to be the best.

The first consists in adding ammonia to a solution of perchloride of iron so long as the precipitate formed is redissolved. A solution is produced which contains ferric hydrate dissolved in ferric chloride, with free chloride of ammonium. Either the *liq. ferri perchlor. fort.*, B. P., or the *liq. ferri chloridi*, U. S. P., may be conveniently used, and the liq. ammoniæ, sp. gr. ·959 or ·960, of either pharmacopœia, will be found a convenient strength. It will be remembered that this is made by adding to the strong ammonia of commerce about twice its bulk of distilled water. If the ammonia be added to the strong solution of iron, considerable heat is evolved, and, on cooling, the preparation becomes gelatinized—often so much so that the vessel containing it may be inverted. It is better to avoid this result, and to this end the solution of perchloride must be diluted until of a specific gravity of about 1·300. This degree may be nearly enough approached by diluting two measures of the B. P. liquor with one of water; or adding one measure of water to five of the U. S. P. preparation. This solution will generally remain permanently bright and fluid. The amount of liq. ammon. required will of course vary with the acidity of the perchloride. The liquor ferri, B. P. will sometimes bear as much as an equal volume. A gelatinized solution, even when made from the undiluted liquor, will often become fluid when put upon the dialyser, but, as I have said before, it is better to work with bright solutions.

The second method consists in adding to either solution of the perchloride a quantity of recently precipitated ferric hydrate. Mix any given quantity of the liq. ferri with about five times its bulk of water and add excess of liq. ammon., also diluted with water. I think a more soluble hydrate is produced when the iron is added to the ammonia, as remarked in the case of the hydrate precipitated from the persulphate; but, in order to proceed in this way, it is necessary to know, approximately, the amount of ammonia required. The precipitate should be washed well, by decantation, with several waters, and then thrown upon a filter to drain for a short time. It may then be dissolved, by the aid of a gentle heat, in as much strong liq. ferri as may be required for solution. The exact quantity cannot be stated, but, in no case will it exceed the volume of the liquor precipitated, and sometimes only one-fourth of this amount will be necessary. The solution is now ready for dialysis.

With the majority of pharmacists the dialyser will have to be extemporized out of such materials as may be at hand. The hoop may be a bell-jar, an inverted glass funnel, or what is even simpler and handier, made from one of the flat hoops of an ordinary flour barrel. This may be smoothed a little with a knife, or sand paper, and made to the required diameter; ten or twelve inches is a convenient size; if much larger the dialytic septum is liable to belly in the centre and thus make the layer of liquid too deep at that point.

Parchment paper is generally used for forming the septum. This is not the paper that stationers in this country generally supply under this name, but a paper made less pervious, and strengthened by being dipped in sulphuric acid. Some of the strong and well-sized papers, as those used for legal documents, may be made to answer. It is absolutely necessary that there be no holes in the septum, and to ascertain this it is best to sponge with water the upper side of the paper and then carefully examine the other side. If any drops appear, the places should be marked, and a little white of an egg may be applied and coagulated by heat; or a drop of collodion or shellac varnish may be put upon the spot. Bladder, previously washed, may be used, and will be found to work well, especially if divested of its outer coat.

The septum should be two or three inches larger than the hoop, and should be secured around it, with twine, not bound tightly, and the edge should be allowed to stand up around the hoop, so that if any liquid escapes through the joint or hoop, it will be retained by the paper. The dialyser will now resemble a drum or sieve, and into this the liquid to be dialysed is poured, to a depth of, at most, half an inch. It is then floated on the surface of some distilled water contained in a suitable vessel. If the hoop be of some heavy material it must be supported so that the septum is but barely below the level of the water.

The time required for dialysing either of the solutions whose preparation has been described will vary with the nature of the septum, its extent of surface, the depth of liquid, the frequency of changing the water beneath, temperature, and other conditions which need not be enumerated. If everything works well, and the water

* From the *Canadian Pharmaceutical Journal*, October, 1877.

is changed daily, the process will be finished in one or two weeks. Distilled water is always preferable, and indeed necessary, especially, for the first two or three days. Clean rain water is the best substitute. The process may be said to be complete when the water no longer shows traces of chlorides, and the preparation becomes nearly tasteless, or, at least, not ferruginous.

A pig's bladder, completely filled with the iron solution, securely tied, and immersed in water, frequently changed, answers well for making this preparation. The process requires a longer time than with a carefully regulated and properly conducted dialysis, but it entails considerably less trouble. When I first tried this plan I was not aware that Professor Dragendorff, of Russia, had some five years ago suggested its application to dialysed iron. I can, however, corroborate all that he says. I may also mention that I think it an advantage to procure the bladder perfectly fresh, as it is then easily cleaned by pure water, and alkaline ley need not be used. Great care is necessary in tying the neck carefully. This can be best accomplished by a few turns of iron wire. Above this may be secured a piece of twine to suspend the bladder, by means of a stick or rod, placed on the edge of the vessel containing the water. The bladder should be perfectly full, and immersed altogether in water. The attraction of the solution for the water is so great that considerable pressure is manifested, and should any weak parts, or holes, be in the bladder, the liquid will be forced out, water will take its place, and failure result.

As to the strength of the dialysed solution I can say nothing, except that with care, and by using the solutions above mentioned, it may be kept over 5 per cent., the quantity of oxide which appears to have been chosen as the standard. One hundred grains of the liquor should be placed in a tared capsule, and evaporated to dryness. The residue should weigh about five grains. If more, distilled water must be added in the calculated proportion. If less, the solution may be placed in a warm and dry place until reduced to the proper volume. If much heat is employed, and often in any case, the oxychloride of iron will be deposited as normal oxide, and the preparation will be spoiled. The evaporation of the solution may, as a rule, be considered a very unsatisfactory process, and every care should be taken to render it unnecessary.

HISTORICAL NOTES ON OPIUM.*

(*Concluded from Vol. VII., page* 1042.)

The most thorough and important study of opium, so far as the progress of science permitted at that time, was made by Wedel or Wedelius,† the author of the celebrated 'Opiologia,' or treatise on opium, from which the following abstract is taken:—By heating opium in a retort, Wedel obtained: (1) a residue; (2) a volatile spirit; (3) a blackish oil, to which opium owes its narcotic power. According to the mode of expression then in use among chemists, opium contained therefore a good deal of "sulphur" (the oily substance), "mercurius" (the volatile matter), and besides, "aqueous, earthy, and salty ingredients." Wedel employed opium with preference in the form of tincture, in doses of ten to twenty drops. In cases of poisoning by opium he administered first an emetic, then *essentia castorei, elixir cephalicum,* and principally *spiritus formicarum*‡ internally and externally afterwards aloe pills. He also mentions that others had recommended camphor and lukewarm baths. He recounts many instances of accidental poisoning, and unmercifully rebukes the authors of these accidents, "the *medicaster parochus*" (parish quack) and the "*tonsor*" (barber). Occasional accidents are also attributed to the physician's writing *opium* instead of *apium.* He also quotes remarkable instances of opium-eaters; among others, that of a French ambassador who took opium by the ounce. The maximum dose he puts at five grains, and gives general directions as to its administration. "Above all, the condition of the patient must be taken into consideration; if this is low and the vital powers feeble, all other indications are placed into the background. Opium is a life-anchor for him who uses it properly and with circumspection, but in the hands of the unskilled it is a semblance of Charon's boat, and pernicious as a sword in the hands of a madman. Great care is therefore to be exercised, that the *narcotic* may not be converted into a *necrotic.*"* After a general introduction, the author discusses the diseases of all parts of the human body in which opium may be used. His principal indications are about the same as those which obtain in our days. The work is accompanied by an appendix treating of the *Maslach*† of the Turks; by its use before a battle, the Turkish soldiers were said to have been excited to such a reckless and fanatic courage as to make them a terror to their foes. This was said to have contained opium. The great traveller, Thurnhäuser, one of the most adventuresome followers of Paracelsus, pretended to know its mode of preparation.

In opposition to Wedel, his celebrated pupil, Stahl,‡ the founder of the phlogiston theory, discouraged the use of opium, as well as that of cinchona and of alteratives.

But the teachings of the celebrated English physicians, Sydenham,§ Cullen,|| and Brown,¶ raised opium to the highest importance. The first one of these termed opium and blood-letting the "*crura medicinæ*" (the legs on which medicine stands), and preferred opium to all other

* From *New Remedies,* July, 1877.

† Georg Wolfgang Wedel, born 1645, at Golzen, died, 1721, at Jena. Celebrated physician and professor at the university. Wrote many medical, pharmaceutical, and chemical works; his 'Opiologia' appeared first in 1674.

‡ *Essentia Castorei:*—1 lb. of castoreum is cut up fine, 6 lbs. of alcohol are added, and after allowing to macerate for eight days the alcohol is distilled off and reserved. The residue is treated with strong wine vinegar, the mixture filtered, and the vinegar distilled off. The residue lef from this distillation is then dissolved in the reserved alcohol.

Elixir cephalicum:—Rad. Pæoniæ, ℥i; Galangæ, Valerianæ, Doronici, Fol. Rosmarini, Mari veri, Salviæ, āā ℥ss; Flor. Anthos, Lavandulæ, Liliorum convall., Pæoniæ, Stœchados Betonicæ, Cubebarum, Succini, āā ʒvi; Visci corylini, Ligni Aloes, Ladani, āā ʒiij; Costi veri, Anacardiorum, āāʒi. Comminute the whole and extract them with alcohol.

Spiritus Formicarum (Cnœphelii):—Urticæ Rom. recent, *man.* i; Betonicæ c. flor., Chamædryos, Salviæ, Rosmarini, Majorani, āā *man.* ss; Flor. Lavandulæ, Sambuci, Primulæ veris, āā *man.* i; Flor. Basilici, Stœchados Arab., āā *pug.* ij: Rad. Rhœados. Confect. Anacardiorum, āā ℥i; Tartaris crudi, ℥iss. Comminute the whole, add 10 lbs. of alcohol, and, after macerating, distil. Then add to the distillate 3 manipuli (handfuls) of living ants and ℥i of crude alum, and after twenty-four hours distil again.

* Lest the ναρκωτικόν (narcotic) become a νεκρωτικόν (death-producing).

† Maslach, or Malach, is a vulgar name for *hemp,* used by the Egyptians and Turks. The intoxicating properties of *Cannabis* seem to have been but little known in Europe at Wedel's time.

‡ Georg Ernst Stahl, born 1659, at Anspach, died 1734, at Berlin. His phlogiston theory, which attempted to explain the various phenomena attending light and combustion, maintained its authority for seventy years, when i was exploded by Lavoisier.

§ Thomas Sydenham, born 1624, at Winford Eagle, died 1689, in London. He is sometimes called the English Hippocrates.

|| William Cullen, born 1712, in Lanarkshire, died 1790, at Edinburgh.

¶ John Brown, born 1735, at Bungle, died 1788, in London, a victim to his own teachings, in a state of chronic intoxication.

narcotics. According to him the three principal indications for its use are: (1) sharp pain; (2) persistent vomiting or purging; (3) considerable disturbance of vital powers. But he rejects it in cases of "inflammation of the blood, upon which many acute diseases depend." Cullen declared fever to be a weak condition of the nervous system, accompanied by an increased heart's action, and he recommends in such cases opium, wine, cinchona, and tonics. But the chief votary of opium was John Brown, who used to say that Sydenham would certainly be a follower of his theory, if he were still alive. His ardent and fanatic worship of opium originated from the soothing effect which he found it to have upon his gout, and he was frequently in the habit, during his lectures, of taking brandy and opium. His system, usually termed Brownianism, may briefly be explained as follows:—Life is a series of actions, which the body is compelled to perform in consequence of its irritability, by external or internal irritations. The disturbances of vital action—that is, diseases—may be consequently divided into sthenic or asthenic conditions, caused by excessive or deficient irritation. The latter condition may have two causes: either the irritability is normal, but irritation is absent, in which case an irritant remedy will furnish relief; or, in consequence of previous over-irritation, the irritability has become diminished; in this case a series of gradually decreasing irritants must be employed until the normal condition is restored. Among the sthenic remedies opium occupies the front rank, besides musk, volatile alkali, camphor, and ether.

Brownianism soon gained a host of adherents; it even was made the official basis of treatment in the Austrian army. A military surgeon praised the cheapness of this method of treatment, as the cure of intermittent fever required only eight kreuzers' worth of opium and thirty-two kreuzers' worth of brandy.* As a counterpart of this may serve the report of another, who states that of six hundred patients treated by this method, two hundred died in the course of twenty-one days, chiefly from alcoholism.

The excitant powers of opium had been observed and pointed out, before Brown, by a German physician, Balth. Ludwig Tralles, of Breslau. The Italian physician, Carminati,† although differing from Brown in the mode of accounting for the operations of opium, nevertheless also acknowledges its excitant properties.

A new epoch in the history of opium begins with the time when chemistry was endowed with better methods of investigation, the immediate consequence of which was the discovery of the alkaloids. The most important of these is morphia, which was discovered by Sertürner,‡ in 1804. From this time to the present the repeated examinations of opium have proved it to be an exceedingly complex substance, and it is likely to prove a fruitful source of research for a long time to come.

* 100 kreuzers (=1 florin). It is hardly necessary to remark, that the system was, after a while, rejected, and that no obligatory "system" has been in use since.

† Bassian Carminati, born 1750, at Lodi, died 1830, at Milan.

‡ Friedrich Wilhelm Adam Sertürner, born 1783, at Neuhaus, died 1841. Apothecary at Eimbeck, afterwards at Hamlin. His researches on morphia and meconic acid, which he had discovered in 1804, were not made fully known until 1817.

TINTED PAPER FOR COVERING CORKS.

Tinted paper may be prepared in any desirable shade as follows: 1 gm. of any aniline colour is dissolved in 30 gms. of strong alcohol, 300 gms. of distilled water are added, and finally a solution of 1½ gm. of tannin in 15 gms. of alcohol. The tannin acts as a mordant. Moderately-sized white paper is spread on a marble slab, or other smooth, hard surface, and the colouring liquid is applied in even horizontal lines by means of a small sponge. The paper is then hung up to dry, and may be covered after a few days with a concentrated solution of sodium silicate, to every 100 parts of which 10 parts of glycerine have been added, if it is desired to impart to it a gloss.

LIST OF PROPOSED ADDITIONS TO THE UNITED STATES PHARMACOPŒIA.

Crude Drugs.—Arum (maculatum and triphyllum), Aurantii folia (Citrus Aur.), Baptisia (tinctoria), Cactus (grandiflorus), Calendula (officinalis), Chelidonium (majus)?, Coca (Erythroxylon Coca), Eriodictyon (Californicum), Eucalyptus (globulus), Fucus (vesiculosus), Galanga (Alpinia officinarum), Galium (Aparine)?, Grindelia (robusta and squarrosa), Guarana (Paullinia sorbilis), Hamamelis (Virginica), Pilocarpus (pennatifolius), Kalmia (latifolia)?, Malva (rotundifolia, etc.)?, Pulsatilla (Anemone Pulsatilla)?, Rhamnus (Rhamnus Frangula), Sumbul (Ferula Sumbul), Symphytum (officinale)?, Thea (Chinensis), Thuja (occidentalis)?, Tilia (ulmifolia; flowers), Trifolium (Menyanthes trifoliata)?, Triticum (repens), Tussilago (Farfara), Verbascum (Thapsus)?, Viburnum (prunifolium).

Chemicals.—Acidum Hydrobromicum dilutum, Acidum Oleicum, Acidum Salicylicum, Acidum Thymicum (or Thymol), Æther aceticus, Amyl Nitris, Apomorphia, Auri Chloridum, Bismuthi Citras, Bismuthi et Ammonii Citras, Chloral butylicum (Croton chloral), Caffeinum, Calcii Bromidum, Calcii Hypophosphis, Calcii Iodidum, Calcii Saccharas, Calcii Sulphuretum, Camphora bromata (monobromated C.), Cinchonidiæ Sulphas, Codeia, Colchicia?, Conia, Emetia, Ferri Bromidum, Ferri Carbonas saccharata (dry), Ferri Hypophosphis, Lithii Bromidum, Magnesia ponderosa (Heavy Magnesia; "Magnesia" might be made to denote the heavy variety alone), Morphiæ Hydrobromas, Paraffinum, Piperinum?, Platini Chloridum, Potassii Arsenias, Potassii Hypophosphis, Potassii Sulphocarbolas, Propylamia?, Quiniæ hydrobromas,—Salicylas,—Tannas, Quinidiæ Sulphas, Salicinum, Sodii Arsenias, Sodi Bromidum, Sodii Chloras, Sodii Hypophosphis, Sodii Iodidum, Sodii Santonas, Sodii Sulphocarbolas, Sodii Sulphovinas?, Trimethylamia?, Zinci Bromidum, Zinci Iodidum, Zinci Phosphidum, Zinci Sulphocarbolas.

Pharmaceuticals.—Acetum aromaticum, Apiol?, Argenti Nitras fusa diluta (⅓ arg. nit., ⅔ pot. nit.)?, Chinoidinum (objected to by some on account of its varying composition), Dextrinum, Elæosacchara, Elixiria—various, Emplastrum ichthyocollæ, Emplastrum fuscum, Extractum carnis, Extractum ergotæ (the fluid extract evaporated), Extractum jalapæ alcoholicum, Extractum malti, Extracta sicca (various), Extractum capsici fluidum, Extractum castaneæ fluidum, Extractum cocæ fluidum, Extractum euphatorii fluidum, Extractum petroselini fluidum?, Extractum tritici fluidum, Extractum vanillæ fluidum, Fel bovis depuratum, Glyceritum vitelli (or Glyconinum = Glyconin), Liquor ammonii anisatus, Liquor chloroformi compositus (Chlorodyne)? Liquor opii compositus, Liquor sodii silicatis. Hydrargyri oleas, Aconitiæ oleas, Morphiæ oleas, Quiniæ oleas, Veratriæ oleas; (being solutions of the salts in excess of oleic acid, they cannot well be classed among chemicals; perhaps it would be best to put them under a special heading "Oleates"). Oleum phosphoratum, Oleum santali?, Opium denarcotisatum (in powder, and of standard morphia strength), Pepsinum, Pulvis glycyrrhizæ compositus, Pulvis morphiæ compositus (Tully's powder), Spiritus odoratus (Cologne), Syrupus calcis lactophosphatis, Syrupus hypophosphitum, Syrupus manganesii iodidi, Tinctura calami, Tinctura calendulæ, Tinctura chinoidini (objected to by some for the same reason as in the case of chinoidine), Tinctura eucalypti, Tinctura ferri acetatis, Tinctura gelsemii, Tinctura thujæ?, Unguentum diachylon (Hebra's Oint.), Unguentum paraffini (or Oleoparaffinum in place of the patented "Vaseline"), Vinum ferri amarum, Zinci nitras fusa.

The Pharmaceutical Journal.

SATURDAY, NOVEMBER 3, 1877.

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AMERICAN VIEWS OF PHARMACOPŒIA REVISION.

WE have on several occasions* placed before our readers a *résumé* of the proceedings of the various bodies concerned in the revision of the *United States Pharmacopœia*, inasmuch as the subject is not only of general interest to the pharmacists of this country, but also because the discussion of it presents special features of interest as regards the position pharmacists should hold in the execution of the work involved in the revision of a pharmacopœia. A further step of some importance is now being taken by the pharmacists of the United States which we think will be of interest.

At the late meeting of the American Pharmaceutical Association at Toronto, a committee was appointed for the purpose of preparing a complete pharmacopœia, which was to be submitted to the medical and pharmaceutical professions, and laid before the final Council of Revision at the Convention of 1880. The short time that is available makes it necessary that the work should be commenced at once in a systematic manner, and that those who take part in its execution should each promptly enter upon his share of the work. The committee consists of C. RICE, W. SAUNDERS, F. HOFFMANN, P. W. BEDFORD, J. M. MAISCH, J. P. REMINGTON, C. BULLOCK, G. F. H. MARKOE, S. A. D. SHEPPARD, J. F. HANCOCK, A. E. EBERT, C. L. DIEHL, E. S. WAYNE, W. H. CRAWFORD, C. MOHR, E. PAINTER. In order to save time six of the members living in New York and Philadelphia and nearest to each other have discussed the general principles which they consider should be followed in the preparation of the new pharmacopœia. A statement of their conclusions has been published in the hope that they will meet the views of other members of the committee as well as the general body of pharmacists.

In the first place it is suggested that the present distinction between materia medica and preparations in both the primary and secondary list shall be abolished, and that all articles shall be described in one alphabetical order, retaining them however under such subordinate headings as acida, aquæ, decocta, etc., whenever it is found useful to give general directions relating to a particular class of preparations, but all formulæ for the preparation of single members of the several classes are to be made complete in themselves. It has also been suggested that the name of a part of a plant should be put first so as to make classes of flores, folia, radices, etc.

Acting on the principle that it is advisable to have a pharmacopœia too full rather than to have it defective, it is proposed not to omit any article at present officinal, but to leave the responsibility of cancelling to the final Committee of Revision; at the same time, however, a list of remedies to be discarded is to be submitted to that committee.

A preliminary list of new drugs and new preparations is put forward by the Committee, comprising most of those which have been recommended for reception during the last ten years, but since some of them are only of questionable value they are mentioned chiefly with a view to eliciting the expression of opinion. The list is, of course, incomplete, and criticism of the list as it stands is invited as well as suggestions of other additions.

The descriptions of all crude drugs are recommended to be concise and clear, sufficient to indicate the istinctive characteristics immediately apparent to the eye, and, when necessary, those visible with a good pocket lens. Common sophistications and admixtures are to be mentioned, and the differences pointed out. The botanical names of plants are to be accompanied by the names of the botanists by whom they were determined and by the name of the natural family. Chemicals are to be described and defined only by tests of identity and of purity, except in cases where differences of preparation may furnish different resnlts. The only cases in which it is considered that processes are required are the following solutions:

Solutions of chemicals (liquores, etc.), Acid. benzoic., Acid. nitro-muriat., Acid. phosphor. dil. (should be made stronger), Acid. hydrocyan. dil., Acid. hydrobrom. dil., Acid. sulphurosum, Aconitia, Arg. nitras fusa, Bismuthi et ammon. citras, Calcii phosphas ($CaHPO_4$), Calcii saccharas, Ferri et quin. cit., Ferri et strych. cit., Ferri citras, Ferri et amm. cit., Ferri et ammon. tart., Ferri et pot. tart., Ferri iodid., Ferri oxid. hydrat., Ferri pyrophosph., Ferri sulph. exsicc., Ferrum redactum, Hydrarg. iod. vir., Hydrarg. oxid. flav., Hydrarg. ammon. chlor. Hydrarg. sulphuret. nig., Potass. sulphuret., Quiniæ salicylas, Quiniæ tannas, Sulphuris iodid., Sulphur. præcip., Antim. oxysulphur., Arsenici iodid., Digitalinum, Acidum oleicum depuratum, Zinci phosphidum.

Temperatures are to be expressed in degrees of both Fahrenheit and Celsius, and under the names of those chemicals which admit of it, the formulæ according to the new notation and the atomic weights are to be given.

All measures of capacity are to be abandoned, and quantities expressed only in parts by weight. As regards the difficulty in carrying out this rule in the case of galenical preparations if it be required to preserve their present strength, it is considered that those tinctures, wines, etc., where a slight variation of dose is of no

* See vol. vii. of the present series, pp. 159 and 597.

account, should all be made of uniform strength, but in the case of aconite, opium, nux vomica, veratria, etc., the present strength of the tinctures should be as nearly as possible retained.

In the case of liquid extracts it is proposed to ascertain, by examining a carefully made series of samples representing minim for grain, the weight of the product obtained from drugs of known hygrometric condition, by means of menstrua of known strength, and the figures thus determined are to be adopted as those indicating the proper weights of liquid extracts. Although the figures thus obtained will vary among themselves, the result will be that these preparations will conform to the rule of being made by weight, and they will represent the drug minim for grain.

Under all officinal articles directly used as remedies the average adult dose is to be stated. In case a remedy, such as opium, has a peculiar effect upon infants, the maximum infant dose is likewise to be stated.

It is also suggested that the Pharmacopœia should comprise tables of the maximum single and daily doses of powerful remedies—poisons and antidotes; the solubilities of officinal chemicals in water and alcohol at 60° F. (15·5° C.), and at the respective boiling points of those liquids; an alcoholometric table; specific gravities of officinal liquid acids; a table of reagents and their proper dilution, and a list of volumetric solutions; a table of the relation between weight and measure in all liquid preparations, in order to facilitate prescribing by weight alone; a table of the various kinds of mineral water used medicinally, showing the nature and amounts of the chief constituents; a comparative table showing the strength of powerful galenical preparations as prepared in America and in other countries; and another table showing the differences in strength of the preparations made by the previous Pharmacopœia and by the new one.

Since the work to be done by the Committee is naturally divided under the three heads of pharmacognosy, chemistry, and pharmacy, it has been thought best to form a Sub-Committee of three, to be called the Expert Committee, each member of which will take charge of one of these departments when necessary, awaiting the co-operation of other members of the General Committee. Professor J. M. Maisch has consented to take charge of pharmacognosy, and Dr. F. Hoffmann has consented to take charge of chemistry. The department of pharmacy includes some open questions requiring settlement and it will be for the present taken charge of by Mr. C. Rice, the Chairman of the Committee, who will also conduct the general management of the business and the codification of whatever is contributed.

ALLEGED ADULTERATION OF MORPHIA.

A paragraph which appeared in the *Lancet* of last week, recommending medical men to be on their guard against adulterated or spurious morphia at present in the drug market, is calculated to cause some alarm. We have not been able to ascertain the authority upon which the statement was made, nor to learn what salt of morphia was referred to, or what kind of adulteration, although it would be very desirable to make these particulars known. Failing in this, however, we have examined several samples of morphia salts obtained from the stocks of wholesale druggists and from retail establishments, but in no instance has any trace of adulteration or impurity been discovered. So far therefore as our inquiry has extended there does not appear to be any ground for apprehension that the salts of morphia are in any way open to suspicion, nor is there any reason to think that there is any difficulty in obtaining these articles in a state of purity. At the same time we endorse the suggestion of our contemporary as to the propriety of exercising caution, not so much in this particular case, however, but as a constant quantity in reference to the purchase of drugs, and we believe that this course will be no less appreciated by the vendors of them, than useful to those who purchase.

IMPURE CREAM OF TARTAR.

Consequent upon the recent case of prosecution under the Food and Drugs Act, at Huddersfield, we have received communications from correspondents which seemed to indicate that the contamination of cream of tartar with barium sulphate had been met with at other places, and that there was reason to fear it might be more general than was supposed. We have therefore had six samples of this substance, obtained from various sources, submitted to analysis, with the result that two out of the six were found to contain barium sulphate in addition to the small amounts of lime and silica which are generally present in cream of tartar, and originate from the grape.

We therefore think it desirable to warn our readers that there is in the market cream of tartar which contains barium sulphate, and to advise them to exercise especial care in regard to this article.

THE NEXT EVENING MEETING.

An Evening Meeting of the Pharmaceutical Society will be held on Wednesday next, the 7th inst., when a paper will be read by Professor Redwood, "On the Poisonous Properties of Yew Leaves." The chair will be taken at half-past eight o'clock precisely.

COUNTER PRACTICE IN THE STATES.

According to the Chicago *Pharmacist* a skirmish of resolutions has taken place between the Medical Society of Alleghany and the druggists of that State. The medical body having passed a resolution that it was the duty of its members to withdraw their prescriptions from any druggist who puts up nostrums, or "who prescribes or recommends any patent or other medicines for any class of cases whether grave or trivial," the druggists have retorted with another to the effect that they will, "in the alleviation of suffering amidst all classes," pursue, as heretofore, the legitimate mode of conducting their own affairs.

PYROTECHNICAL PHARMACY.

A circular has been issued by the Chief Constable of Oldham, addressed to "Chemists and Druggists and all Shopkeepers who sell any fireworks or other explosives," requesting them not to supply such articles to boys or other persons likely to make use of them improperly.

Transactions of the Pharmaceutical Society.

Addendum.—At the examination in Edinburgh, reported on p. 333 of last week's Journal, Professor Maclagan was present on behalf of the Privy Council.

BENEVOLENT FUND.

List of Subscriptions and Donations to the Benevolent Fund received during the months of September and October, 1877:—

Acton, Samuel F., 16, Sheendale Terrace, Richmond, S.W.	0	5	0
Allen, Thompson, 15, High Street, Boston	0	5	0
Archer, J. S., Guiseley, Leeds	0	2	6
Ashley, William, Cheapside, Derby	0	10	6
Atkinson, George, Wolverton	0	5	0
Atkinson, James, 226, Blackfriars Road, S.E.	0	2	6
Baigent, Thomas G., Darlington	0	5	0
Balkwill, Joseph, Kingsbridge, Devon	0	10	6
Ball, William, 65, Russell Street, Landport	0	5	0
Balmforth, A., 5, Pershouse Ter., Ardwick, Manchester	0	10	6
Barker, Thomas, Lozells, Birmingham	0	10	6
Bates, Henry, George Street, Oldham	0	10	6
Bathgate, W. L., 23, Canning Place, Liverpool	0	10	6
Beasley, F., 74, High Street, Clapham	0	10	6
Birch, H. C., Upper Norwood, Surrey	1	1	0
Bishop, T. N., High Street, Cradley Heath	0	10	6
Blain, William, Bolton	0	10	6
Bray, William J., Romford	0	5	0
Bridge, C. H., 33, Euston Square, N.W.	0	10	6
Bridgman, W. L., St. Marychurch, Torquay	0	5	0
Bright, Richard, Peterborough	0	10	6
Brownridge, P. F., Openshaw, Manchester	0	10	0
Brunt, Thomas H., Market Street, Hyde	0	10	6
Buchanan, James, 52, North Bridge, Edinburgh	1	1	0
Burgoyne, Burbidges and Co., 16, Coleman Street, E.C.	2	2	0
Bush, Thomas, Paulton	0	5	0
Callaway, L., Ipswich	0	10	6
Chaplin, J. L., 55, Corn Market, Wakefield	0	10	6
Clarke, Thomas E., Market Place, Shifnal	0	5	0
Clifton, Frederick, 34, Corn Market, Derby	0	10	6
Cockshott, William, 32, Westgate, Bradford	0	2	6
Collier, John A., 55, James Street, Cardiff	0	2	6
Cook, Thomas, 52, Northgate Street, Gloucester	1	1	0
Cooper, W., 238, Hornsey Road, Holloway, N.	0	5	0
Cranston, John, Darlington	0	5	0
Crawshaw, Henry, 240, Moorfields, Sheffield	0	10	6
Cullen, R. H., 96, Westbourne Grove, W.	1	1	0
Curtis, Frederic G., Plough Court, Lombard St., E.C.	0	5	0
Dadley, Elijah, 21, Carter Gate, Nottingham	0	10	6
Dawson, John, 55, High Street, Dudley	0	5	0
Doubell, James, 1, Tavistock Cres., Westbourne Pk., W.	0	5	0
Doulton and Co., 63, High Street, Lambeth	1	1	0
Duffin, Thomas, Wakefield	0	10	6
Edisbury, J. F., Bersham Hall, Wrexham	1	1	0
Entwisle, Joseph, 7, Tanfield Street, Leeds	0	5	0
Evans, Lescher and Evans, 60, Bartholomew Close, E.C.	1	1	0
Everatt, Robert, Newbald, Yorks	0	2	6
Fallowfield, Jonathan, 36, Lower Marsh, Lambeth	1	1	0
Farnsworth, Thomas, Codnor, near Derby	0	5	0
Ferguson, W. H., Elm Bank, Hornsey Lane	1	1	0
Fletcher, H. B., 3, Ellin Street, Moor, Sheffield	0	5	0
Flowerdew, W. C., Walter Street, Nottingham	0	2	6
Foster, A., Dewsbury	0	10	6
Freeman, Frederick, Wendover	0	5	0
Frith, John B., Coggeshall	0	5	0
Gain, Frederick, 139, Brecknock Road, Upper Holloway	0	10	6
Gibson, J. P., Fore Street, Hexham	0	10	0
Gould, Robert G., Fowey, Cornwall	0	10	0
Govan, Alexander, St. Andrews	0	10	6
Greaves, Eccles, 49, High Street, Mexborough	0	10	6
Griffin, Henry S., Bourton-on-the-Water	0	10	6
Griffiths, John M., Waltham Abbey	0	5	0
Grimwood, W. A., 22, Brook Street, Bond Street, W.	0	10	6
Grose, Nicholas M., Swansea	0	10	6
Hall, Ephraim, Luton, Beds	0	2	6
Harris, D. R., 55, St. James's Street, S.W.	1	1	0
Harris, James, 7, Alexandra Terrace, West Cowes, near Swansea	0	7	6
Hay, Thomas A., Wavertree, Liverpool	0	10	6
Hayton, Peter B., Lingdale, Guisborough	0	10	6
Hayles, W. W., 21A, Arundel Street, Landport	0	5	0
Hickman, William, Archer Street, Kensington, W.	0	10	6
Hogwood, Edward, 12, Commercial Place, Plough Road, Rotherhithe	1	1	0
Insull, Edward S., Hanley	0	5	0
Jackson, F. J., Bawtry	0	5	0
Jackson, Geo., 759, Rochdale Rd., Harpurhey, Manchester	0	10	0
James, A. W., Sketty, near Swansea	0	2	6
James, John B., Dragon Wharf, Truro	0	10	6
Johnson, Benjamin, 18, Long Causeway, Peterborough	0	5	0
Johnson, W. and R., Leek	0	10	6
Jones, Charles, Bromyard	0	5	0
Jones, Owen, Llanrwst	0	2	6
Kay, Brothers, Lower Hill Gate, Stockport	1	1	0
Kearnes, Robert W., Bilston	0	5	0
Keyworth, G. A., Hadley House, Hastings	0	10	0
Knight, G. E. M., 45, High Street, Winchester	0	5	6
Knowles, Richard, Great Crosby, near Liverpool	0	5	0
Laycock, John, Skipton	0	5	0
Leath and Ross, 5, St. Paul's Churchyard, E.C.	2	2	0
Leech, R., 34, Upper Duke St., Hulme, Manchester	0	10	6
Levick, George A., Caistor	0	4	0
Livsey, J. W., Middleton	0	2	6
Linford, John S., The Quabbs, Drybrook, Gloucester	1	1	0
Logan, Francis, Market Street, Lichfield	0	5	0
Lomas, Joseph, Nottingham	0	5	0
Longman, John H., 3, St. Mary's Street, Weymouth	0	2	6
Lloyd, John, London Road, Croydon	0	5	0
Lloyd, W., 26, High Street, Carnarvon	0	5	0
Luff and Woodland, 13, Lisson St., Marylebone Rd., N.W.	1	1	0
Luff, Richard, 1, Bute Street, South Kensington	0	10	6
Mackinlay, F. J., 31, St. James' Street, Liverpool	0	10	6
Maleham, H. W., 7, West Bar, Sheffield	0	10	6
Marsden, T. B., Snaith, via Selby	0	10	6
Marsh, John, Treville Street, Plymouth	0	5	0
Marten, Frederick, Plough Court, Lombard Street, E.C.	0	5	0
Mayfield, J. T., Newcastle-on-Tyne	0	10	6
Monkhouse, Henry, Allsaints, Derby	0	5	0
Mumbray, R. G., Richmond, Surrey	0	5	0
Nicklinson, Thomas, Derby	0	5	0
Northcroft, J., Plymouth	0	5	0
Ordish, Thomas, Ingleby, Derby	0	5	0
O'Neill, James, South Bank	0	5	0
Padwick, T., Red Hill	1	1	0
Penrose, Arthur P., 5, Amwell Street, E.C.	0	10	6
Pepper, John, 237, Tottenham Court Road, W.	0	10	6
Perks, F., 37, High Street, Stourbridge	0	5	0
Pick, Richard, 5, Woodhouse Square, Leeds	1	1	0
Picken, Thomas Wm., Newport, Salop	0	10	6
Pipe, Walter, 1, King's College Road, N.W.	0	10	0
Powell, Thomas H., 7, Poultry, E.C.	0	10	6
Raimes and Co., 58, Hanover Street, Liverpool	1	1	0
Randall, T., Wareham	0	10	0
Raw, James H., Parkgate, Darlington	0	5	0
Rawlinson, Ralph, 2, Lawn Villas, Eltham Road, S.E.	1	1	0
Ridding, W., 237, Tottenham Court Road, W.	0	5	0
Rivett, A. J., 21, Gloucester Road, South Kensington	0	5	0
Robinson, A. F., Darlington	0	10	6
Robinson, James, 25, Tubwell Row, Darlington	0	5	0
Roberts, James, Victoria Place, New Brighton	0	5	0
Roebuck, Alfred, King Street, Knutsford	0	2	6
Rossiter, George, Tiverton	0	5	0
Rowden, Lewis, 89, Princes Road, Notting Hill, W.	0	5	0
Rump, Robert R., Wells, Norfolk	0	5	0
Rouw, W. T., Market Place, Ruthin	0	10	6
Sanders, George S., Gold Street, Tiverton	0	2	6
Saxby, H. and R., High Street, Lewes	0	10	6
Shirley, J. G., 2, Westbourne Grove, Bayswater	2	2	0
Simcock, J. S., 2, Copenhagen Street, N.	0	5	0
Simpson, Robert G., Stowmarket	0	5	0
Simpson, T., and Son, Stowmarket	0	10	0
Simpson, W., Beverley	0	5	0
Smith, Wilson & Co., Leith	1	1	0
Smith, J. G., J.P., Dover	1	1	0
Smith, J. S., Northfleet	0	5	0
Smith, R. F., 35, High Street, Barton-on-Humber	0	5	0
Smith, Wm. B., Horton Road, Alverstoke	0	2	6
Sowden, Samuel, 262, Wakefield Road, Bradford	0	5	0
Staning, W., 55, Cogan Street, Hull	0	5	0
Stedman, William, Ashford, Kent	0	10	6
Stewart, John, Regent Place, Birkenhead	0	10	6
Stone, Thomas W., Market Place, New Malden	0	5	0
Storey, E. H., 42, Castle Street, East, W.	0	5	0
Strawson, George, Bishops Castle	0	10	6
Talbot, W. J. C., Finkle Street, Selby	0	2	6
Taylor, J. B., Bedford	0	5	0
Teasdale, Thomas, Youlgreave	0	5	0
Thomas, John, Cowbridge	0	5	0
Troake, R. J., 126, Whiteladies Road, Clifton, Bristol	0	10	6
Trotman, A. C., 16, Cambridge Street, Hyde Park	0	10	6
Upjohn, F. W., 55, King Henry's Walk, Mildmay Park, N.	0	5	0
Watson, T. E., 65, Clayton Street, Newcastle-on-Tyne	0	10	6
Watts, Edward, Haywards Heath	0	5	0
Waugh, Mrs. E., Rose Cottage, Leatherhead	1	1	0
Welborn, G., The Dispensary, Grantham	0	2	6
West, D., Keighley	0	5	0
Wheeler, F., Guildford	0	5	0
Whitaker, Mrs. E. H., 105, Cemetery Road, Stockport	0	5	0
Wilcox, G., 11, Prospect Row, Birmingham	0	10	6
Williams, Richard W., Manor Road, Liscard	0	10	6
Williamson, Edward, Darlington	0	10	6
Wills, G. S. V., 62, Lambeth Road, S.E.	0	10	6
Wilson, John, Darlington	0	2	6
Woolford, James, 61, Kirkgate, Leeds	0	5	0
Wooster, J. R., Broadway, Turnham Green	1	1	0
Wrigley, W., 182, Manchester Street, Oldham	0	10	6

Donations.

Andrew, Rev. Samuel, Tideswell Vicarage, by Sheffield	0	10	6
Jones, John, The Dispensary, Llandudno	1	1	0

Provincial Transactions.

HULL CHEMISTS' ASSOCIATION.

The annual meeting of the above Association was held at the Cross Keys Hotel, on Thursday evening, October 18. The President, Mr. C. B. Bell, occupied the chair. The minutes of the previous meeting having been confirmed and two new members elected, the President called upon the Secretary to read the following annual report:—

"The officers of your Association have pleasure in presenting the usual annual report, at the termination of the official year, and hope that it will meet with your approval. During the session seven members have been elected, two have resigned, and one has died, leaving at the present time fifty-five members.

"The first matter requiring the attention of the Committee was the introduction of the suicidal policy of selling patent medicines and proprietary articles to the general public at reduced prices. This was commenced by a firm of grocers with whom the Committee were unable to deal. Had it, however, been confined to them it would not have been of much consequence. Unfortunately, a chemist in the neighbourhood adopted the same plan, and it has been followed by some few others. Your Committee have reason to believe that it has not been found to answer as expected, and would strongly urge all to continue selling at the legitimate prices, feeling sure that it will be found to be the best and safest plan in the end.

"The annual supper was held at the Cross Keys Hotel, in December, and your Association was honoured by the presence of the Mayor, K. King, Esq., M.D., and other gentlemen.

"The chemistry class has been conducted by Mr. J. Baynes, F.C.S., Borough Analyst, at his laboratory, in Scale Lane. He reports that the session comprised a series of twenty lectures, attended by eight students, and that good progress had been made by those who attended regularly. The examiners, Messrs. J. F. Smith and Stoakes, report that five students competed for the prizes at the end of the session, Mr. T. Brown carrying off the senior, and Mr. Barlow the junior prizes.

"It had been thought advisable that the following session should commence earlier. The class has, therefore, been inaugurated by an address from Mr. J. F. Smith, and from the fact that twelve students have joined already, your Committee feel justified in having commenced thus early.

"Mr. Niven reports that the botanical class consisted of a series of twenty-six lectures, commencing on May 9, and terminating on October 5. Thirteen students attended, six of whom rarely missed a lecture, and the attention paid was everything a lecturer could desire. The competition for the herbarium prize, given by Dr. Sawdon, consisting of books, to the value of thirty shillings, has been most satisfactory. Three students competed all showing admirable specimens, the most important difference being in the number. Mr. T. Brown stood first, with a collection of more than four hundred species, beautifully dried, mounted and arranged, scarcely one plant being wrongly named. It represented more than one-fourth of the flowering plants indigenous to Britain. Mr. A. D. Markham stood second in order of merit with a collection of three hundred and ten species, equally as well selected and mounted as the previous one, only two or three trifling errors occurring in the naming. Mr. O. Lambert, the youngest competitor, stood third with a collection, although inferior to the others in point of numbers, consisted of one hundred species, and was most commendable, and in former competitions would have taken a better position. Dr. Sawdon expressed himself as more than satisfied with the result, and for himself, Mr. Niven felt bound to endorse his good opinion in a practical way, by giving books to the value of a sovereign as second prize, and recommended the Association to give a book of the value of ten shillings for a third prize.

"For the prize offered by Dr. J. H. Gibson to the student who passed the best examination in physiological botany, a sufficient number of students did not come forward, and it was therefore withheld.

"The annual meeting of the Pharmaceutical Society, also the annual meeting of the Chemists and Druggists' Trade Association, both being held in London, were attended by your President. The Conference was not attended by any member of your Association.

"In March a resolution was unanimously carried at one of the meetings, and a copy forwarded to the Secretary of the Pharmaceutical Society, calling the attention of the Council to the fact that opium and its preparations, put up in the form of patent medicines, and bearing a government stamp, were being sold by unregistered persons. Your Committee have since noticed with satisfaction, that a grocer who had been selling the same, and against whom the Pharmaceutical Society commenced proceedings, had paid the penalty of five pounds; and it is hoped that proceedings will also be taken against many others who are doing the same thing.

"In April your Association had the pleasure of receiving S. U. Jones, Esq., the President of the Chemists and Druggists' Trade Association, as a deputation from that Society. A trade meeting was held at the Hull Church Institute, your President occupying the chair. Resolutions were unanimously carried pledging the meeting to support by every means in its power the Trade Association in its aims and objects.

"In May, Dr. Lush, M.P., proposed to introduce into Parliament a Bill intituled "A Bill to amend the Medical Act of 1858." Had this Bill become law, no chemist could have recommended any drug or medicine to a customer, for the most trivial complaint, or in the most simple case, without infringing the Act. It therefore called up strenuous opposition throughout the country, the Chemists and Druggists' Trade Association taking the initiative, and your Committee are glad to say it was abandoned.

"Your Committee also notice with great satisfaction that the much vexed milk of sulphur question has been settled, and trusts that such cases will not again be brought forward by the public analysts.

"The trade has also been harassed by the Medical Defence Association on the question of the legality of counter practice, and it is hoped that when the Court of Queen's Bench decides the case which will be brought before it in November, the decision will be found to be on the side of common sense and public expediency. Should it be otherwise your Association will have more work before it immediately. In this, as in the milk of sulphur case, also in reference to Dr. Lush's Amended Bill, the thanks of all chemists are due to the Chemists and Druggists' Trade Association, and your Committee would urge all who have not hitherto joined it to become members at once.

"Your Treasurer will present a report of the finances of the Association which shows a credit balance of 20*l*. 11*s*. 1*d*.

Statement of Accounts.

Receipts.

October, 1876-7.	£	s.	d.
To Cash in Hand	2	9	2
,, Cash in Bank	10	0	0
,, 58 Annual Subscriptions	14	10	0
,, 7 Fees Chemistry Class	7	7	0
,, 1 Part Fee for Two-Thirds Course	0	15	0
,, Donation	1	1	0
,, Interest on 15*l*. deposit in Bank	0	2	6
,, Part Cost of Prize for Chemistry Class	0	19	6
,, Balance from Annual Supper	0	8	0
,, 13 Fees Botany Class	6	16	6
,, 8 Fees Chemistry Class Session 1877-8	8	8	0
	£52	16	8

Expenditure.

October, 1877.	£	s.	d.
By Postage Cards, etc.	0	9	6
,, Cash to Mr. J. Baynes, F.C.S. (Lecture Fees)	15	15	0
,, Cash, Mr. Niven (Lecture Fees)	7	17	6
,, Printing, Bookbinding, etc.	2	8	0
,, Books for Prizes	1	16	7
,, Advertising	1	14	0
,, Hire of Room	0	5	0
,, Reporting	1	1	0
,, Expenses of Deputation	0	19	0
,, Cash in Bank	10	0	0
,, Cash in Hand	10	11	1
	£52	16	8

The annual report and the balance-sheet were then adopted, and the following gentlemen elected as officers of the Association for the ensuing year:—President, Mr. C. B. Bell; Vice-President, Mr. G. Myers; Secretary and Treasurer, Mr. B. M. Stoakes; Committee, Messrs. J. Bradley, J. Grindell, J. Oldham, and J. F. Smith.

LEEDS CHEMISTS' ASSOCIATION.

The winter session of this Association was inaugurated by a tea in the Assembly Room, Queen's Hotel, on Wednesday evening, October 17th; the President, Mr. Peter Jefferson, occupying the chair.

The Secretary having given a *résumé* of the minutes of the annual meeting, held in May last, the prizes given by the Association to the four most successful students attending its classes on chemistry and botany last session were distributed; Mr. Robert Stewart taking the first and Mr. George Coverdale the second in chemistry, and Mr. S. N. Tredwell the first and Mr. James Banks the second in botany. Mr. Pierson was then elected a member, and Mr. Cowgill an associate.

The inaugural address was delivered by Mr. Jefferson. Having expressed his regret that the office of president of the Association and more especially of that meeting had not fallen into abler hands, though doubtless the selection had been made on account of his long career as a chemist and druggist in the town—a period of over forty years—he proceeded to refer to the practice of retail chemists formerly powdering and preparing a very much larger number of articles than now, and expressed his regret that such was the case, especially in the interests of learners. The change taking place in other countries as well as our own in this respect was doubtless on account of its being more economical to buy than to make; the wholesale manufacturer, owing to greater facilities and larger experience, being able to supply at cheaper rates. Reference was also made to the practice of chemists and druggists, especially those situated in the outskirts of large towns and in country places, dealing in such articles as grocery, oils, paints, colours, brushes, perfumery, etc., which might be considered as belonging to other branches of trade, and which he thought might be done without its being considered derogatory to the profession of a chemist and druggist. The dealing in patent medicines, although apparently belonging more to the trade, was fraught with a good deal of what was certainly of a character not very elevating to the business. Their sale was formerly very largely, and still continued to some extent, in the hands of the booksellers, whilst shopkeepers of other classes were now going into the trade very considerably, to which no very plausible objection could be made as no skill was required, and the government stamp removed all responsibility from the seller. With reference to the recent attempt at legislation to prevent the druggist giving advice to his customers in his own shop, which had been a long established usage, he considered that any such measure would not only interfere with their interests and cause a good deal of annoyance, but would in a much larger degree affect the interests and convenience of the public, especially of the poorer classes, who would in many cases be driven to pauperize themselves by having recourse to the various charitable institutions. The druggists ought not, however, to court any such practice, either by advertizing or any other similar means, as any such proceedings would not only injure their cause, but would be a departure from their legitimate profession. As to the complaints heard from many in the trade that neither the Pharmaceutical Society nor the Trade Association attempted to prevent grocers and others selling drugs, he replied that no government would so far interfere with the interests and convenience of the public and the freedom of trade unless it was shown that the practice was dangerous to the community. A limitation of such sales had been accomplished by the Poisons Bill, and the list of articles scheduled therein might be further increased, but it was impossible to prevent the sale of the great majority of drugs by any one who might choose to do so. The address was concluded by an appeal to those present not to be dissatisfied with their calling as chemists and druggists, as it might safely be classed amongst the most useful and interesting, and its character was continually improving; at the same time the younger members were reminded that its requirements were likewise increasing, and that it was incumbent upon them to keep well up with the times, in the matter of chemistry more especially, that science being taught in many of the schools and most of the institutions for mental improvement.

Mr. Alderman Stead, in a vigorous speech, proposed a vote of thanks to the president for his address. He said it was forty years since he first tied on the white apron, and contrasted the times then and now. More was expected of young men now than then; the classes on chemistry were then badly attended, on account of the length of the hours of business, but now matters were much improved, and he advised the young men to make good use of their greater privileges. The Sale of Food and Drugs Act, he thought, was right in some points, but it would take some time to educate the public up to the appreciation of a pure article. With respect to counter prescribing, he thought the line of demarcation betwixt legality and illegality, right and wrong, was very difficult to draw, but that in low districts more especially chemists should be allowed to prescribe for children and the poor.

Mr. Abbot, in seconding the vote of thanks, dwelt upon the value of learning thoroughly, not from books only, but also from practical work.

Mr. Barclay, of Birmingham (who happened to be in Leeds on business at the time), expressed the pleasure he had in attending meetings of this class, and in giving what encouragement he could to this and similar associations, considering them of the greatest importance to the well being of the trade. He then gave an account of the doings of the Chemists' Trade Association with which he is more immediately connected, amongst other things stating that good counsel had been secured for the Nottingham appeal case expected to come off in the Queen's Bench early in November, and that the Medical Defence Association appeared to be in rather low water at present, from the summary method they had recently adopted of issuing writs.

The proposed vote of thanks having been put to the meeting by Mr. Yewdall, was carried by acclamation, and duly acknowledged by the Chairman.

Proceedings of Scientific Societies.

EDINBURGH UNIVERSITY CHEMICAL SOCIETY.

Deleterious Action of Syphons on Aerated Waters.

BY JOHN STUART THOMSON.

Notwithstanding the numerous and searching investigations of which the presence of lead in aërated waters has been the subject, there is one very important source whence the poisonous metal is frequently derived, namely, syphons, which has to a great extent been overlooked by experimenters. The use of these vessels being now so common, it seemed to me to be of vital interest to determine whether the storing of aërated water in them had the effect of in any way increasing the quantity of lead in the beverage. Some time before I began this investigation, Sir Robert Christison had condemned their use for lemonade, owing to the action which the free tartaric acid present in the lemonade has on lead and by this advice some of the leading manufacturers have entirely given up filling syphons with anything containing a free acid, such as tartaric.

Knowing the above, I directed my attention solely to the examination of potash and pure aërated water; the samples I operated on were obtained from one of the chief manufacturers in this city, so that I could be certain that every possible precaution had been taken to keep them as free from lead as possible. The first sample examined was that of the water used for the manufacture; this was taken direct from the cistern, and was found to contain somewhat less than 0·0014 gr. of lead per gallon, consequently no fault could be found with it. Potash water drawn direct from the syphon-machine was next tested, and was found to contain 0·0175 gr. of lead per gallon, which, according to Miller, is not an unusual amount for average cistern water. After it had been in a syphon, however, the amount began to rise in a rapid manner. Thus, in potash water, drawn from a syphon, 0·0408 gr. of lead per gallon was found to be present, being nearly 2·5 times the quantity found in the same water before it entered the syphon. Pure aërated water again drawn in a similar manner from a syphon, gave 0·0816 gr. of lead per gallon, or exactly double the amount found in the potash water, showing at once the well-known protective action that salts of the alkalies and alkaline earths have on lead.

Although these results are sufficiently high and alarming, still when the water is drawn off in small quantities at a time, as is frequently the case with invalids, the results are found to be still higher; thus when potash water was so treated 0·0455 gr. of lead per gallon was found, while aërated water, drawn off in small quantities, gave 0·0933 gr. of lead per gallon, showing a very marked rise in both cases.

The cause of this increase in quantity of the lead appears to be owing not so much to the lengthened period of contact between the liquid and the metal, as to the fact that the nozzle of the syphon, being exposed to the atmosphere in a moist state, becomes rapidly oxidized or carbonated, and is thus left in the most suitable condition for entering into solution, so that when merely small portions of the liquid are drawn off each time a comparatively concentrated solution of lead is obtained.

As much has been said about the metal or alloy of which the nozzles are composed, I examined a portion of one, and found it to be composed of tin and lead only; the tin was estimated, and gave 53·99 per cent. Sn., leaving 46·01 per cent. Pb.

Thinking that it might be interesting as well as instructive to examine into the solubility of carbonate, or rather bicarbonate of lead, in carbonic acid water, freshly precipitated hydrate of lead was suspended in distilled water, and well-washed carbonic acid was then passed through for about one hour at ordinary temperature and pressure. The filtered liquid thus obtained was found to contain 29·11 grs. of lead per gallon. As a final experiment clean unoxidized lead chips were treated in a precisely similar manner to the above, when the liquid was found to give the following results:—

After	2 hours' contact	0·175 gr. Pb.	per gallon.
„	26 „	0·350 „	„
„	46 „	0·380 „	„
„	96 „	0·510 „	„

showing clearly that in the case of the pure unoxidized metal the length of period of contact has a very marked effect.

SOMERSETSHIRE ARCHÆOLOGICAL AND NATURAL HISTORY SOCIETY.

English Names of Wild Flowers and Plants.*

BY REV. W. TUCKWELL.

Eight years ago I was piloting a famous botanist from the east of England among the fields and lanes round Taunton, when he asked me the name of a plant which he did not at the moment recognize. I answered that it was the gipsy-wort, and received a prompt rebuke. "This is the third time," he said, "that I have inquired the name of a flower, and you have answered me in English. The Latin names are universal, the English, at best, are local. It is to be wished that all English names of plants could be forgotten, and their scientific names become popularized instead." Unquestionably a foolish utterance, it was of great service to myself, for it set me to consider the real value of those names which my pedantic guest despised, and from that time to this I have never encountered the popular name of any English wild flower without questioning it closely as to its etymological history and meaning, and noting the passages in our literature where it occurs. It would be a great pleasure to me to believe that the knowledge gained by these inquiries, put together to the best of my power, could interest you to-night as much as it has interested myself.

It is no new thing to infer from the terms in use at the beginning of a nation's history the arts and customs of the nation using them. Thus, the fact that in all or nearly all the Aryan languages the words for the Supreme Being, for the king, for brother and sister, for ploughing, grinding, building, closely resemble one another, is admitted to show that our common forefathers in times when they were still one people, and had not yet scattered into India, Persia, Europe, had the beginnings of religion and government, possessed the family life, knew the simple arts which are most needed for the comfort of home life. Let us see what light will be thrown upon the habits of our Teutonic forefathers if we apply their method of investigation to the popular names of plants.

Teutonic names.—The following words are common to all the Teutonic languages—must have been known, that is, to the race from which we ourselves, with the Germans, Danes, Swedes, and Norwegians, are descended, on their first settlement in Europe, and before they broke up into subdivided nations. The first I will take is birch, the rind of which must, we find, have been used for boat building and for roofing houses; for boat building, since the word "bark," from the same root as birch, stands for ship in English, Dutch, Icelandic, Danish; for roofing houses, since the old English *beorgan* and the German *bergen*, also from the same root, mean to cover, protect, or shelter. From this simple word, then, we gather that our ancestors possessed the arts of building boats and of roofing or thatching houses. Houses could not be built without timber, and we find the word "tree" in almost every Aryan language standing for three things—for a tree, for timber, and for an oak, extending the use of oak wood for building purposes back to the first formation in Asia of our mother language, and presenting us with the additional facts that our European ancestors built of oak timber the houses which they roofed with birch. In hazel a fresh fact lies buried. It is in all Germanic dialects the instrumental form of *hæs*, command or behest, a hazel stick having been used, as Jacob Grimm informs us, in the earliest times as a sceptre or baton to keep order among slaves and cattle. Without dwelling on the fact that the old word, *hælsian*, to foretell, indicates the use of the hazel rod for purposes of divination, we have the additional probability revealed in a single word that

* Lecture by Rev. W. Tuckwell before the Somersetshire Archæological and Natural History Society. *Gardeners' Chronicle* for September 22, from *Nature*.

our remote ancestors possessed slaves and cattle. In hawthorn, common to Swedish, German, and English, we have testimony to the use of a haw, *hæg*, hedge, or fence, "honouring the holy bounds of property," and consequently to the division and appropriation of land, in the earliest Teutonic time. My next word makes some demand upon your etymological credulity. Without tracing particulars, I will ask you to believe that the Sanskrit *kshi*, to dwell, passes through various forms—in one direction to the English "home," in another to the word "heath;" now meaning the plant which grows wild on open land, standing originally for the land itself. "My foot," says Rob Roy, "is on my native heath"; and the same idea was enshrined in the same word to the first Teuton settler. In the forest he fought his enemies, hunted his prey, hewed timber for his fences, and peeled timber for his roof; his home was in the open land, or heath, from which, again, when ages had passed away and Christianity possessed the towns, he still worshipped his father's gods upon his father's heath, and gained, as Trench thinks, his ancient name of heathen. A sixth word lifts him higher than all the rest. The word beech, in Gothic, old High-German, modern German, Norse, Danish, Dutch, English, is identical with book, the Runic tablets of our ancestors having been carved upon this wood. In sloe, the wild plum, we have the root of "slay," its tough wood having been used for bludgeons; dog-wood is dagger-wood, from *dag*, to strike; from ash, whose wood was therefore used for spear-shafts, came the old English *æsc*, a spear; sedge is allied to *sæcg*, a sharp small iron sword. And let us observe that while all these plants, bearing purely Teutonic names, extend far into Northern Asia, trees which stop short at a more southern limit—the elm, chestnut, holly, sycamore, plum, pear, peach, cherry—all have Latin names, showing that the Teuton squatters came from a colder country than that in which they are supposed to have settled near the Roman provincials on the Lower Rhine. The knowledge that wheat, barley, oats, corn, rye, are all Teutonic words, completes the historical picture given by the first list of names. They show us a race of men coming from a northern to a southern region, dwelling in timber houses, roofed and thatched, launching boats upon the rivers, possessing cattle and slaves, recognizing the rights of property and the sacredness of home, fighting with cudgels, swords, and spears, familiar with cereal agriculture, in some way not ignorant of letters. All these facts, just hinted at here, but challenging minute investigation, we owe to a dozen common names of English plants, whose Latin equivalents teach and commemorate nothing of any national interest to ourselves.

Greek and Latin names.—These names, and a few more, are as old as the English language; but from the conquest to the sixteenth century botanical inquiry ceased in England, and the rest of our popular names are little more than 300 years old. Most of these come to us from the Greek and Latin. Any scholar will detect in acacia the Greek word for guilelessness; in the amaranth, with which Milton's worshipping archangels wreathed their brows, the Greek for unfading; in the periwinkle, the *pervinca* used to bind about the head; in lettuce, the meaning of milky; in geranium, the descriptive name, crane's bill. In the plane he will see the *platanus* of the poets; in the rose, the *rhodon* of Homer and the *rosa* of Virgil; in the sycamore, the wild fig of the Bible, transferred in mediæval miracle-plays to the tree which now bears the name; in the vine, the *oinon* and *vinum*, whose Sanskrit root is still present in our words twine and twist. He will understand that the basil, which poor simple Isabel planted in the pot which held her murdered lover's head, was the regal plant, used perhaps of old in some royal bath or unguent; that the angelica, which now flavours our soups, and was once a specific against the plague, was given to mankind by angels; that the belladonna was applied as a cosmetic to make ladies beautiful for ever; that the cyclamen, which still grows wild in Devonshire, owes its name to its prominent circular tuber. He will not so readily discover that the tansy of our cottage gardens is the Greek *athanasia*—immortality, administered to Ganymede that he might become fit for his life in heaven; that the common milfoil yarrow is the *hiera*, or holy herb, pledged to heal all herbs with its fragrant leaves; that nasturtium means nose-twister, from its pungent smell; that our quantock whortle-berry is a corruption of *myrtillus*, myrtleberry; that eglantine is *aculenta*, the prickly rose, or sweet briar; that the herb-bennett or *avens*, is the *benedicta*, blessed herb, kept in houses to prevent the entrance of the devil; that the hip of the dog-rose is a form of the Greek and Latin words which people afflicted with sore throats know as jujubes; that liquorice is an Anglicism of the Greek *glycyrrhiza*, sweet-root; that the larch is from the Latin *lar*, a house, in consequence of its use in building; that lavender, from the Latin *lavare*, to wash, was in the twelfth century Scotch and northern English for washerwoman, because then as now its sweet spikes were laid amongst fresh linen; that the service-tree is the Latin *cerevisium*, beer—its leaves having been used to flavour ale before the virtues of the hop were known; that the little squinancy-wort was the ancient remedy for the disease *kynanche* or dog-choker, which we know in its modern sound as quinsy; that the mushroom is the muscarius or flybane, because a particular agaricus, pulverized and mixed with milk, was used in Southern Europe as we now use the poison called "Keating's Insect Powder." Least of all will our scholar be quick to admit that the narcissus owes nothing to the love-sick youth over whom Ovid sang and Bacon moralized, but is connected with the Greek *narkodes*, sluggish, a derivative from *narke*, the torpedo, itself sprung from the Sanskrit *nark*, hell; cited by Sophocles (Œd., Col., 682), as crowning the gods of Hades; gathered by Proserpine before her wedding tour into the same dark region, because its heavy odour (for by it the ancients meant the hyacinth) blunts the nerves and makes men sleepy and torpid.

French Names.—I can find comparatively few names which we have borrowed from the French. Dandelion is, of course, the lion's-tooth. Mignonette is applied by us to a very different plant from that which bears the name in France. Woodruffe, known to travellers in Germany as flavouring the pleasant drink called *maitrank*, takes its last syllable from *roue*, a wheel, its verticillate leaves being set like a wheel or rowell on the stone. Pansy is *pensée*, thought, from its significance in the language of flowers: "There's pansy," says Ophelia—"that's for thoughts." Gilliflower is *giroflée*, from *caryophyllum*, a clove, a name originally given to the carnation, but now transferred to the wall-flower. Tutson is *toute-saine*, the oil in its leaves having made it a remedy for wounds. Most curious of all is apricot, from *abricot*, which at one time I contentedly referred to the Latin *apricus*, sunny, ripening as it does on sunny walls. It is, in fact, traceable to the Latin *præcox*, early, the fruit being supposed by the Romans to be an early peach. The Arabs took the Latin name and twisted it into *al burquq*; the Spaniards altered its Moorish name into *albaricoque*; the Italians reproduced it as *albicocco* the French as *abricot*, and we get it next in England curiously enough as apricock, so spelt in Shakspere's time, and finally as apricot.

Legendary Names.—Many curious bits of myth and history reveal themselves as we excavate down to these old meanings. The pæony, or healing-plant, commemorates the Homeric god Pæon, the first physician of the gods, who tended the bellowing Ares when smarting from the spear of Diomed. The centaury is the plant with which the centaur Chiron salved the wound inflicted by the poisoned arrow of Hercules. The ambross, or wormwood, is the immortal food which Venus gave to Æneas, and Jupiter to Psyche—the Sanskrit *amrîta* which Kehama and Kailyal quaff in Southey's splendid poem. The anemone, or wind-flower, sprang from the tears wept by Venus over the body of Adonis, as the rose sprang from his blood—

αἷμα ῥόδον τίκτει, τὰ δὲ δάκρυα τὰν ἀνεμώναν.

The daphne, syringa, and andromeda tell their own tales; the last, which you may find in the peat-bogs round Shapwick station, is due to the delicate fancy of Linnæus, who first discovered and named it, blooming lonely on a barren, rocky isle, like the daughter of Cepheus, chained to her sea-washed cliff. The juno-rose, or tall white lily, was blanched by milk which fell from the bosom of Juno, the tale being transferred in Roman Catholic mythology to the Virgin Mary and the milk thistle. The yellow carline thistle is named after Carl the Great (in Mr. Freeman's county I must not call him Charlemagne), who, praying earnestly for the removal of a pestilence which had broken out in his army, saw in vision an angel pointing out this plant as a heaven-sent cure. The herb-robert healed a disease endured by Robert, Duke of Normandy, still known in Germany as *Ruprecht's-plage*. The filbert, though this is disputed, commemorates the horticultural skill of one King Philibert. The treacle mustard, a showy crucifer resembling wallflower, was an ingredient in the famous Venice treacle, compounded, as you will remember, by Wayland Smith to treat the poison sickness of the Duke of Sussex. The word treacle is corrupted from the Greek *theriacum*, connected with wild beasts, whose blood formed part of the antidote. It was at first made up by the physician to Mithridates, king of Pontus, and is still in many parts of England known as mithridate mustard. The flower-de-luce, or *fleur-de-lys*, is the flower of King Louis, having been assumed as a royal device by Louis VII. of France, though legend figures it on a shield brought down from Heaven to Clovis, when fighting against the Saracens. It is probably a white iris.

Not a few strange superstitions and beliefs are embalmed in well-known names. The celandine, from *chelidon*, the swallow, exudes a yellow juice, which, applied by the old birds to the eyes of young swallows, who are born blind, or have lost their sight, at once restores it. The hawk-weed has the same virtue in the case of hawks. The fumitory, *fume-terre*, was produced without seed by smoke or vapour rising from the ground. The devil's-bit is a common scabious, with a premorse or shortened root, which was used so successfully for all manner of diseases, that the devil spitefully bit it off, and for ever checked its growth. The eyebright, or *euphrasy*, was given to cure ophthalmia.

"Michael from Adam's eyes the film removed,
. . . Then purged with euphrasy and rue
The visual nerve, for he had much to see."

The judas-tree, with its thorns and pink blossoms, was the tree on which Judas hanged himself. The mandrake gathered round itself a host of wild credulities. It was the *Atropa mandragora*, a plant nearly allied to the deadly nightshade, but with a large forked tuber resembling the human form. Hence it was held to remove sterility, a belief shared by Rachel in the Book of Genesis, and was sold for high prices in the middle ages with this idea. In fact, the demand being greater than the supply, the dealer used to cut the large roots of the white bryony into the figure of a man and insert grains of wheat or millet in the head and face, which soon sprouted and grew, producing the semblance of hair and beard. These monstrosities fetched in Italy as much as thirty gold ducats, and were sold largely, as Sir T. Brown tells us, in our own country. It was thought that the plant would only grow beneath a murderer's gibbet, being nursed by the fat which fell from his decaying body; hence it formed an ingredient in the love-philtres and other hell-broths of witches, and, as it was believed that the root when torn from the earth, emitted a shriek which brought death to those who heard it, all manner of terrible devices were invented to obtain it. The readers of Thalaba will remember the fine scene in which the witch Khawla procures the plant to form part of the waxen figure of the destroyer. I have seen the plant growing in the Cambridge Botanical Gardens; it is not uncommon in Crete and Southern Italy; its fruit is narcotic, and its name is probably derived from *mandra*, an enclosed, over-grown place, such as forms its usual home.

The medical beliefs revealed by many names are not less curious than their legendary associations. It was the opinion of the old herbalists or simplers that God had not only provided special plants as a cure for every disease, but had made their curative power evident by stamping them with some resemblance to the malady they were meant to heal; and this faith, known to students of our older botany as the "doctrine of signatures," lurks or reveals itself in many an English name. The lung-wort, spotted with tubercular scars, was a heal for consumption; the liver-wort, liver-shaped in its green fructification, was a specific for bilious maladies; the scaly pappus of the scabious for cutaneous eruptions; the throat-like corolla of the throat-wort, or Canterbury bell, caused it to be administered for bronchitis; the saxifrage, cleaving the hard stones with its penetrating fibres, was efficient against calculus; the scorpion-grass, now known as the forget-me-not, whose flower-spike dimly resembles a scorpion's tail, was an antidote to the sting of that or other venomous creatures; the moon-daisy averted lunacy; the birth-wort, kidney-vetch, nipple-wort, spleen-wort, were all appropriated, as their names suggest, according to resemblances, real or fancied. The pretty toad-flax of our walls and hedges owes its names to a strange mistake. Believed to be the cure for a complaint called buboes, it received the Latin name *bubonium*. A confusion between *bubo* and *bufo*, which is Latin for a toad, gave birth to its present name; and stories were not long wanting that sick or wounded toads had been seen to eat of it and to recover health.

Similar distortions occur in non-medical names, and it is most curious to notice how soon a story springs up or a belief asserts itself in confirmation of the mistaken identity. The common fumitory, which we have already noticed, received its name of *fume-terre*, "earth-smoke," from its causing the eyes to smart and water when applied to them, as smoke does. The meaning was lost as time went on, and was supplied by the belief that it was produced without seed by smoke or vapour rising from the earth. Buttercup was said to give colour and flavour to butter, as being eaten by cows, when in blossom, the facts being that it is a corruption of *bouton-cop*, button-head, and that cows eat the grass all round it, but always, if possible, avoid it. Meadow-sweet is a corruption of mead-wort, honey-wine plant, a beverage being still extracted from it by cottagers. Bullrush is pool-rush, as growing in pools, not in mud; snap-dragon is snout-dragon, from its shape; marigold is marsh-gold; sweet-william is *œillet*, a little eye; pink is the lower German *pinksten*, pentecost, from its flowering at Whitsuntide, the name being transferred first to the colour of the flower, then to a method of working flowers on muslin, called pinking; and so to the sword stab in a duel, piercing or pinking an adversary as the needle pierced the cambric. Nightshade is *night-scada*, soother, or anodyne; samphire is St. Pierre, from its love of rocks; sanicle is St. Nicholas, the restorer of the three murdered children, from its healing powers; poplar comes from the Indian pepul, whose leaves, when varnished and painted, closely resemble those of the large Spanish poplar; primrose was anciently the daisy, and is called by Chaucer primerole, from the old French *primererole*, the first spring flower; primerole was changed to primrolles, then to primrose, the first rose of spring, and it was not till the sixteenth century that it attached itself to the familiar flower which now bears its name. Cowslip is more strange still. It was originally "hose-flap," and belonged to the mullein, whose great flannelly leaf might well be likened to the flap or skirt of a woollen under-garment. Later on it was transferred to the wild primula of our meadows, and the mistake was stereotyped by the unlucky botanist, who, in ignorance of its origin, gave the name of oxlip to its pretty congener, the *Primula elatior*. The Jerusalem artichoke is a sunflower, not an artichoke; but the tubers resemble the artichoke in flavour. From its Italian name *girasole*, turn to the sun, came Jerusalem; and by a further quibble the soup made of it is called Palestine soup. The forget-me-not was originally the "Germander Speedwell," whose blossoms, falling of and flying away as soon as it is plucked, gave emblematic force to the name. It was known in the days of chivalry as the "flower of souvenance," and was embroidered into the collars of the knights, a fact still recalled by its German name *Ehrenpreis*, prize of honour. About 200 years ago we find the name given to the ground pine, *Ajuga chamæpitys*, whose nauseous taste once realized can never be forgotten. Finally it was seized upon by the river-side myosotis, and forthwith sprung up a charming legend, created obviously to suit its latest identification—how that while two lovers loitered by a lake, the maiden saw and longed for the bright blue flowers, the knight plunged in to get them, but, unable to regain the shore, had yet agility enough to fling them into his lady's lap, and then, with a last devoted look and the words "forget me not," sank below the waves for ever.

(*To be concluded.*)

Parliamentary and Law Proceedings.

Poisoning by Hydrocyanic Acid.

On Saturday, the 27th October, an inquest was held before Mr. G. F. Harrison, coroner for Leicester, respecting the death of Mr. Sydney Ellis. It appeared that the deceased was a member of a firm of woolspinners, of which his father, the chairman of the Midland Railway Company, is the head, and that he had under his charge the machinery and dyeing departments. In connection with the latter there was a chemical laboratory in which deceased frequently worked. On the previous day he had been found lying insensible on the floor of the laboratory and shortly afterwards died. There was a bottle containing hydrocyanic acid on the table, and a work on chemistry open at the part which treated of cyanide of hydrogen. In the opinion of the medical witnesses his death was caused by inhaling hydrocyanic acid.

Mr. Frederick Parsons, chemist, Gallowtree Gate, said he had supplied the deceased with chemicals for four or five years, and on going into the laboratory he found many bottles of chemicals, including cyanide of potassium, cyanogen and hydrocyanic acid.

Dr. W. S. Emerson, analyst for the county, said he saw the deceased, whom he had attended previously for six years, on the floor of the laboratory. There was no appearance of any struggle, the limbs were placid, and the pupils of the eye were dilated. There was no smell perceptible from the mouth, which was open, and the lips were not marked. He added that the deceased was very short-sighted, and he thought might have placed his nostrils too close to the gas.

A verdict in accordance with the evidence was given.

Robbery at a Chemist and Druggist's.

At the Marylebone Police Court on Monday last, Henry Howard, 21, described as a betting man, was charged on remand before Mr. Mansfield with having broken into and entered the house of Mr. Frederick Andrews, a chemist, and keeper of a post-office at 34, Leinster Terrace, and having stolen therefrom about £34 in money and £10 in postage stamps. Mr. B. Osborne prosecuted on behalf of the Post Office authorities. The evidence showed that on the morning of the 20th inst., a constable who was on duty near the house saw a light inside, and being suspicious that all was not right he obtained the assistance of some other constables, and having stationed them in the front and at the back of the house he rang the bell. The light was immediately extinguished, and shortly afterwards the prisoner and another man were seen at the rear of the premises. As soon as they caught sight of the police they darted back and got into an adjoining garden. Pursuit was given, and the prisoner was apprehended near Lancaster Gate, Hyde Park. The prisoner was remanded.

Review.

A New London Flora. By E. C. De Crespigny, M.D., etc. London: Hardwicke and Bogue, 192, Piccadilly, 1877.

The title of this book is evidently a misnomer. It had better have been called the 'Young Botanist's Handy Guide to the Collection of Flowering Plants in the Home Counties.' While it will not bear comparison with such carefully executed works as Trimen's 'Flora of Middlesex,' or Roper's 'Flora of Eastbourne,' it has evidently been written by one who knows what the requirements of young botanists in London are, and who has endeavoured to meet them. The first requisite for the amateur is necessarily to become acquainted with all the plants growing in Britain, or at all events, excepting those which are alpine. Bearing this in mind, the author has not limited himself to giving the localities immediately around London, nor hesitated to include those rich in plants which are within a two hours' ride by rail. Thus we find Guildford, Godalming, Tunbridge Wells, Windsor, and even Reading among the localities quoted. This latitudinarian tendency will render the work of great utility, as it will enable not merely residents in London but also those residing in the various towns around it to find many plants, of the habit and mode of growth of which they might otherwise remain in ignorance.

A very useful list of synonyms and of forms or doubtful species placed opposite to their type, or true species, gives at a glance the differences in opinion between the "lumpers" and "splitters" among British botanists. As the synonyms have special relation to the 'London Catalogue of Plants' (by the same publishers) and are arranged in the same order, this list must be very handy for reference. But the very dogmatic assertions of the author, with regard to the right of certain plants to rank as species, which occur throughout the 'Flora,' are, we think, quite out of place in a work like this, which cannot pretend to take a classical rank.

In the flora proper all the plant names are arranged alphabetically. This is an excellent plan, as it saves both time and trouble; indeed, we believe that private herbaria would be much more frequently used for reference if they were arranged in the same way. All the localities which the author has visited, and in which he can certify the occurrence of the plants recorded, are marked by an asterisk; this feature gives a special value to the book, for every field botanist knows how localities becomes destroyed in the course of a few years. The labour attending upon verifying localities must have been immense, and the seven years during which the author has been carrying on these his investigations must have been fully occupied whenever weather permitted. The references to localities not visited by the author are less reliable than could be wished, and appear to have been chosen with but little judgment.

The book being of small size can easily be carried in the pocket, and the botanist who is wise enough to have it interleaved and to carry Hayward's or Notcutt's 'Handbook of British Plants' in another pocket, if he records his observations may do useful work on every trip he takes, instead of, as is too often the case, taking many more plants than he requires and keeping no record of the forms he meets with.

In the cryptogamic portion, errors are not unfrequent;

indeed, considering the constant change of names during the past few years, it is scarcely possible, unless attention be wholly directed to these plants, to keep pace with the latest ideas and names. Mosses, scalemosses, lichens, and fungi are studied by comparatively few amateur botanists, and we think this portion had better have been left out than only half done, or at least that the author would have done well to have had the proofs revised by an authority upon these groups of plants. As it stands it is useful neither to the amateur nor to the advanced cryptogamist.

The second half of the book is devoted to localities, a short description of the soil, and of the nature of the district being given and followed by a list of the plants to be found in each locality. Thus a botanist visiting Hampstead Heath sees at a glance what to look for. This portion of the work will probably be found very useful to young botanists. We can recommend the book, as a handy pocket guide, to all Londoners who are interested in flowering plants. We hope that each visitor to localities of rare plants will remember that many others may follow in his footsteps, and that if he helps himself too liberally the rarer species will rapidly disappear, and the present edition will soon require revision.

Dispensing Memoranda.

[21]. Apothecaries' or Avoirdupois.—In the series of valuable articles under the head of "The Month" in the Journal of Saturday last (reply to dispensing query No. 21) it is stated that when the sign ℥j occurs in a prescription, "the apothecaries' weight consisting of 480 grains should be used." Being under the impression that this question had been finally settled in the opposite direction some ten years since, I was somewhat surprised at the reply. It is true that when ʒj is written we use sixty grains, but we have pharmacopœial authority for so doing (quoting from the preface of the B.P. p. 13), "but it will be optional for the physician in prescribing to use the symbols ℈ and ʒ, the former representing twenty and the latter sixty grains, if such should be found to conduce to accuracy or convenience." Now the omission of the ℥ in this paragraph implies unquestionably that when it occurs in prescribing, the avoirdupois ounce of 437·5 grains is the only one to be recognized. The apothecaries' weight is not used, either in buying, preparing, or selling our medicines, it is practically unknown in commerce, and why the writer of the above named article should recommend its retention in dispensing I must confess my inability to understand.

Liverpool. Charles Symes.

[21]. Apothecaries' or Avoirdupois?—In the article entitled "The Month" in the Journal of Saturday last, on page 323, you say "In dispensing a prescription containing a powder, thus, ℥j, the apothecaries' ounce should certainly be used; the symbol ʒj represents 60 grs., and ℥j eight times sixty, or 480 grs." There are those who are of opinion that in such a case the apothecaries' ounce should certainly *not* be used. ʒj and ℈j respectively represent not the eighth or twenty-fourth part of an ounce, as an ounce is understood nowadays, but simply 60 and 20 grains. The troy ounce and pound are practically obsolete. If a physician prescribe ℔j, would you dispense a troy pound? I hope not. Why then when he prescribes ℥j would you dispense a troy ounce? A customer asks you for an ounce of Epsom salts, or a physician for an ounce of quinine. Do you give either of them a troy ounce? I fear not. If a physician writes to you for a number of articles, and one item be, say, quinine ℥j, would you understand him to mean, and supply to him an ounce of 480 grs.? I venture to think that you would not. Yet when you get a prescription for ℥j you dispense an ounce of 480 grs.! It would seem that "℥j" has got one value commercially and another professionally.

What follows is from the preface to the Pharmacopœia:—

"The avoirdupois ounce and pound being the weights practically used in the sale of medicines, and generally in commercial transactions, were adopted in the edition of 1864, and are still retained in preference to troy weights of the same denominations. . . . It is strongly urged upon all medical men to avoid the use of the terms ounce and pound with reference to any other than the avoirdupois or imperial standard weight."

In the light of the foregoing it seems to me that, if a physician when he writes ℥j means 480 grs., he has no business to do so. What good is there in throwing overboard, in theory, the troy weight, if in practice we retain it? What I would like to ask, in conclusion, is "How do you know that when a physician writes a prescription for ℥j, he intends 480 grs. to be dispensed?" I shall be glad to hold myself indebted to you or any one else who may be conversant with the "latent" intention of prescribers, if you or they can give me some good reasons why "in dispensing a prescription containing a powder thus, ℥j, the apothecaries' ounce should certainly be used."

Glasgow. P. B.

[24]. Some Remarks upon a Method of Coating Pills.—Noticing from time to time inquiries concerning pill coating, I have thought that a few remarks as to the method I have applied and found to be successful, will be acceptable to some of my *confrères*, who wish to coat pills for sale. In the first place, the pills must be dry and round; and to have a pill, which when coated preserves its white pearly appearance, it must contain no essential oil—this is essential; gingerine is sometimes used as a substitute. Place the pill in a covered pot, and moisten with some of the following solution:—Rosin, 30 grains; Bal. Tolu, 20 grains; Eth. Sulph., 1oz. Having shaken them together, turn them out on a slate to dry; when dry, place them in another pot, and moisten with syrup (ʒj Syrupus B.P. to ʒvij water), then throw them into a tin box with closely fitting lid, about the size and shape of an eight-ounce covered pot, containing some finely powdered French chalk; agitate the box briskly for a minute or two, or until the pills become coated; then turn them into another box, giving it a rotary motion sufficient to render the pills round, and to give them a smooth surface.

Care must be taken not to make the pills too moist, at the same time the surface must be thoroughly covered with the solution.

By following the above directions, and with a little practice, any one can coat pills, equal in appearance to those met with in the market.

51, *Judd Street, W.C.* Felix Stevens.

[24]. Pill Coatings.—In your monthly article of Oct. 27 were some valuable and suggestive remarks on pill coating, from which I quote the following sentence:—"There is a small American apparatus, mentioned by Professor Markoe at the Brighton Conference, for sugar coating pills extemporaneously."

This recalls to my mind a fruitless quest upon which I once entered, and I crave permission to relate it.

Having always regarded sugar as *à priori* the best pill coating, and lamented the difficulties which stood in the way of its everyday use, I caught eagerly at the suggestion of an apparatus for overcoming these, and wrote both to Professor Markoe, and to Professor Wayne—who accompanied him—asking the favour of further information about it.

Not receiving a reply from either of these gentlemen, and after numerous vain attempts in other quarters, on the recommendation of Mr. H. Brandreth, I applied to the well-known firm of Messrs. J. F. Henry Curran and

Co., of New York, who sent me a copy of their catalogue' superbly printed, full of interest to the pharmaceutist, but—giving not the faintest clue to the object of my search.

Lastly, I wrote to a firm who advertized themselves as importers of American machinery, and they courteously promised to forward the inquiry to the other side of the Atlantic; from whence, however, no response has ever reached me.

Under these circumstances, may I be pardoned for asking—Did the Professor evolve the apparatus in question from the depths of his own inner consciousness?

Dover. T. F. BROWN.

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[27]. AQ. CAMPH. CONC.—Experimenting upon the solubility of camphor in dilute spirit for the purpose of obtaining an aq. camph. concentrated for the extemporaneous production of camphor julep, I arrived at the following conclusion:—In the first place I made spiritus camphoræ by dissolving

Camphor	16 scruples in
S. V. R.	4 ounces
Water	1 ounce.

One ounce of the above contains sixty-four grains of camphor, which diluted with seven ounces of proof spirit will contain eight grains in one ounce, or one grain in each fluid drachm. One such fluid drachm added to two ounces of water, mixes readily and forms, according to Squire, aq. camph. B.P., *i.e.*, half a grain camphor in each fluid ounce. In fact the result is a more satisfactory preparation, since the quantity of camphor held in solution is definite and certain.

If aq. camph. fort. is required, the diluted solution is miscible up to one and a-half fluid drachm in one ounce of water; beyond this a slight precipitate takes place.

Brighton. W. CORNISH.

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[35]. FER. CIT.—In answer to "*Burton*" I think that, when ferr. cit. is ordered, ferr. am. cit. should be used; unless the mixture contain a mineral acid, when ferr. cit. is correct. VERB. SAP.

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[36]. Melt the ol. macis in the ol. olivæ with the aid of a gentle heat; then place in a mortar and triturate well, adding very gradually first the liq. ammoniæ, then the aq. rosæ, and lastly the sp. rosmar. until an emulsion is made. W. H. R.

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[38]. Can any one suggest the best method of mixing the following ingredients without subsequent separation?

℞	Liq. Ammon.	℥iss.
	Ol. Macis	℥ss.
	Ol. Amygdal. Dulc.	℥j.
	Sp. Rosmar.	℥ij.
	Eau de Cologne	℥iv.
	Aquæ	ad ℥xij.
	Misce.	

ADERYN.

Notes and Queries.

[557]. WHITE OILS.—Try equal parts lime water and almond oil, very carefully mixed.

W. AND T. JONES AND CO.

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[559]. TINCT. PYROPHOS.—I have received a prescription, evidently of homœopathic origin, ordering tinct. pyrophosph. Can any reader oblige me with a formula? M. LEIGH.

Harrogate.

[560]. WOOD SOOT.—Can any one oblige by informing me of a means of obtaining a small quantity (a few ounces) of wood soot? I have been unable to get any recently. A. C. A.

Obituary.

Notice has been received of the death of the following:—

On the 20th of September, 1877, Mr. Jabez Fowls, Chemist and Druggist, Kensington Road, Southport. Aged 46 years. Mr. Fowls had been an Associate of the Pharmaceutical Society since 1870.

On the 29th of September, 1877, Mr. James Shacklock, Chemist and Druggist, South Caves, Yorkshire. Aged 45 years.

On the 30th of September, 1877, Mr. Thomas Makinson, Chemist and Druggist, Chapel Street, Southport. Aged 31 years. Mr. Makinson had been an Associate of the Pharmaceutical Society since 1870.

On the 13th of October, 1877, Mr. Edward Charlwood, Chemist and Druggist, Dale End, Birmingham. Aged 46 years.

On the 20th of October, 18.7, Mr. James Parnell. Chemist and Druggist, Berry Street, Wolverhampton Aged 40 years.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE BELL SCHOLARSHIP EXAMINATIONS.

Sir,—I quite agree with "Detur Digniori" respecting catch questions, but I fail to see what exception can be taken to the passage from Virgil given for translation at the last Bell Scholarship examination. "Detur Digniori" attaches some importance to the capital letter, C, in Cæsariem, and says it "is calculated, and I should think intended, to 'catch' the unwary." What can justify this remark? Does he give the examiners credit for an attempt to lure candidates into concluding (on account of the capital C) that it was a proper name, and so render it "Cæsar?" I scarcely think the examiners could expect such an exhibition of ignorance on the part of any young man who felt justified in competing for a "Scholarship." Would not such a candidate's translation of any passage in Virgil be rather curious? "Detur Digniori" says, "to the youth fresh from his Virgil the passage offers no difficulty." I take it that all candidates for the Bell Scholarships are fresh from Virgil, or would stand but a poor chance of success in competing for a prize the first subject of which is plainly stated in the regulations to be "Virgil; the three first books of the Æneid." The passage in question is not an unusually difficult one, nor is it removed from its context so far as to destroy its sense or prevent it (from *namque* to *honores*) being quoted by one of our best and greatest lecturers on rhetoric and belles lettres as a fine example "where Virgil, from the feeling of his subject naturally runs into smooth, liquid, and flowing numbers." Though I yield to none in condemnation of "catch" questions, or any tendency to encourage "cram," I cannot think that "Detur Digniori" has maintained a case against the examiners *in re* this passage from Virgil.

GUSTO.

PROSECUTIONS UNDER THE PHARMACY ACT.

Sir,—In commenting on my letter, published in the *Pharmaceutical Journal* of October 20, Mr. Fairlie appears to have misunderstood my objection to the prosecutions at Birmingham. If he will refer again to my remarks, he will see that I did not defend the illegal trading of unqualified persons. On the contrary; I said, "Had either of the parties been prosecuted under the 15th section, doubtless a conviction would have resulted." My point was that they had not infringed the provision of the 17th section.

The example I cited, of "Apothecaries' Hall," does, I conceive, very fairly apply to the present case, even according to Mr. Fairlie's description. He says, the manager "is there to represent the company." Just in the same way, "in the event of any accident occurring," consequent on an article sold at the establishment, and bearing the name of "Morris and Co., Chemists, 87, Islington, Birmingham," Anson Edwin Martin was there to represent the company. The question of his qualification was, for the purposes of the 17th section, entirely immaterial.

M.P.S.

The Sale of Food and Drugs Act.

Sir,—Permit me to take exception to the conclusion you draw in your leader in last week's Journal upon the annual report of the Local Government Board on the Sale of Food and Drugs Act.

The readers of the Journal will greatly err if they suppose the examples you quote from the report convey anything like the true state of matters as regards drugs and pharmaceutical preparations. Even your own figures show 33 per cent of adulteration.

It would be a great fallacy to suppose 1 in 3 represents the purity of Liverpool; and although Brighton is the Paradise of England, I do not think it is free from this particular sin. I fear, sir, the innocence of your nature inclines you to believe all men are pure. This is only a consummation devoutly to be wished. I am willing to admit the evil that has been committed under the Act, but the benefit also is great.

Alpha.

[*** We cannot admit the exception taken by our correspondent to the conclusion drawn in the article he refers to. We had no intention of leading our readers to suppose that the data quoted from the report represented the true state of matters as regards drugs and pharmaceutical preparations for that would amount to the assumption that more than 30 per cent. were adulterated. Without raising any question as to analysts' results, we merely took the official figures representing the work done under the Act as showing, so far as they go, that the supply of drugs is not open to serious suspicion, since it must be supposed that the samples examined were obtained from sources where adulteration was thought probable. However, if a greater amount of unrevealed adulteration is practised as our correspondent seems to imply the only conclusion is that the Food and Drugs Act is not doing the work it was intended to do.—Ed. Pharm. Journ.]

Professional Co-operation.

Sir,—The "M.R.C.S." who lowers himself to supply cheap advice at the West End co-operative store will no doubt be snubbed by his professional brethren. Is it not so with the chemist who lends his name to the stores that take away the legitimate profits of his own trade? If he ever commences business for himself he is only blighting his own prospects. Surely he does not hold a very enviable situation.

"Live and Let Live."

Pimlico, October 29, 1877.

Dangerous Coloured Fires.

Sir,—During the past two weeks articles have appeared in the Journal relative to the danger of coloured fires containing sulphur in combination with chlorate of potash; I therefore think a few words on the subject may interest some of your readers. Many of the cases of spontaneous combustion and consequent explosion undoubtedly arise, as Mr. Walters states, from free acid in the sulphur in commerce, and his suggestion to use washed sulphur instead of the ordinary article, although a good one, is not new; as most of the modern treatises on pyrotechny recommend its use in many of the formulæ given. But the non-use of washed sulphur does not arise so much from ignorance as he supposes; another cause, viz., price, being a great consideration with the manufacturer of cheap coloured fires, and the amateur pyrotechnist in many instances wilfully runs the risk of spontaneous combustion rather than pay the higher price of the washed article.

The process adopted by Mr. Walters in washing his sulphur is not a good one for the purpose, on account of the difficulty of washing away the soda employed, and if this is not thoroughly done, there is a great chance of deteriorating the colours of the fires; for from numerous experiments, I have found that a half per cent. of a soda salt, mixed with nitrate of baryta, almost entirely destroys the green colour of its flame, and two per cent. mixed with nitrate of strontia, the red colour.

But even washed sulphur is not infallible, for however thoroughly washed it has a tendency to generate acid, and especially so when in contact with chlorates. I would therefore recommend a method which has been largely employed for some years in the manufacture of an explosive having a similar composition, namely, to intimately mix 120 grains of powdered bicarbonate of potash with each pound of sulphur, before using it in the manufacture of any composition into which chlorates enter.

This method has been found most successful and does not influence the colours of the fires. I have some compositions so prepared four years ago, and although they have been kept in paper for that time and have been alternately exposed to damp and again dried on three occasions, have exhibited no signs of spontaneous combustion; this is a test which I think very few compounds, even if made with washed sulphur, would withstand.

With regard to the formulæ published in this Journal vol. ii. n.s., and again referred to by Mr. G. C. Druce in last week's issue, though they produce excellent results, they are not likely to be generally adopted, on account of cost in production compared with those containing sulphur.

Henry Child, F.C.S.

W. Millington.—The *Journal of Dental Science*, published by J. and A. Churchill.

O. Jones.—Your letter has been forwarded as requested.

W. H. Story.—Your request has been complied with.

G. Evans.—The only explanation that we can furnish is that your letter was considered unsuitable for publication in the Journal.

"*Aderyn.*"—The substitution of one article for another in making up a prescription would be unjustifiable. In the case of an incompatibility the prescriber should be consulted if possible. For your other questions see p. 359.

Student.—See a paper on the preparation of glycerine jelly in vol. v. of the present series of this Journal, p. 401.

"*Ignoramus.*"—(1) In our opinion the label sent would necessitate the use of a stamp. (2) There is nothing illegal in the supply of such articles by wholesale dealers. (3) Oil of nerve is neat's-foot oil; by oil of petre probably petroleum is meant. (4) Such titles are entirely fanciful, and are extended to many preparations, recipes for which are given in the ordinary receipt books.

"*Quœro.*"—Dip white unsized paper into a cooled mixture of strong sulphuric acid with half its volume of water, and afterwards wash the paper with water containing a little ammonia.

R. Jones.—We do not understand why you should have expected effervescence to take place under the circumstances stated.

H. Sparshott.—We are not acquainted with such a preparation.

Chemists' Assistants' Association.—We have received a letter from a Member of this Association who is desirous of making it known that a temporary room has been taken for three nights weekly, in which assistants can meet and discuss topics, play chess, or read papers connected with the trade. He is of opinion, however, that unless the number of members be greatly increased, the Association will inevitably come to an untimely end, the reason given being that chemists' assistants appear to lack courage enough to launch out the requisite subscription. At the same time he appeals to "those chemists in business (both London and provincial), who have half a guinea to spare, and don't know how to put it to a good purpose," to send it to the Hon. Secretary, Mr. E. Cardwell, 92, Kirk Dale, Upper Sydenham, S.E., and become honorary members. We are sorry to say that this betrays a lamentable want of "backbone" in the new association. If it is to depend upon visionary half-guineas that chemists in business do not know what to do with it, is not likely, neither would it deserve, to be permanently successful.

"*Rama*" and "*Chemist by Examination.*"—*Prosecutions under the Pharmacy Act.*—Your letters in reference to the correspondence on this subject having direct personal bearing can only be published with the signatures of the writers.

Communications, Letters, etc., have been received from Mr. Young, Mr. Thirlby, Mr. Elliman, Mr. Kinninmont, Mr. Stoakes, Mr. Bennett, Mr. Oates, Mr. Taylor, Mr. J. W. Lloyd.

THE POISONOUS PROPERTIES OF YEW LEAVES.*

BY PROFESSOR REDWOOD.

Cases not unfrequently occur in which animals are poisoned by eating the leaves of the yew tree. Pereira says, "the poisonous properties of the yew were known to the ancient Greeks and Romans, and have been fully established by modern experience, although some few writers have expressed doubts concerning them." Bentley and Trimen mention, but at the same time discredit, an opinion sometimes entertained that the leaves are not poisonous to animals if eaten off the tree, but become so if cut and allowed to lie on the ground for some time before being eaten. It is sometimes asserted that the leaves are only poisonous at a particular period of the year, an opinion which has probably originated in the circumstance that animals are most likely to browse off the yew, an evergreen, when other vegetation is deficient. Several instances are recorded of human subjects having died from swallowing the leaves and also the fruit of the yew, yet many persons bear testimony to their having eaten the fruit with impunity, and this may be explained by the fact that the part that would be generally eaten, namely, the soft fleshy part of the fruit, which forms the sweetish subacid cup enveloping the hard nuciform seed, is innocuous, while the seed itself is poisonous.

The yew is not used as a therapeutic agent by qualified medical men in this country, but yew leaves are sold by some of the herbalists, and used as an emmenagogue among the lower classes.

Dr. Alfred Taylor says that "infusion of yew leaves, which is popularly called yew-tea, is sometimes used for the purpose of procuring abortion by ignorant midwives." A case in which it was used for this purpose, and in which it proved fatal to the life of the patient, having recently come under my notice, I have thought it desirable that some of the facts should be recorded.

The wife of a railway porter in the neighbourhood of London, being in the family-way, and having had a very difficult delivery at the birth of the previous child, was induced, with the concurrence and aid of her husband, to resort to the use of a decoction of yew. The husband procured some of the leaves and twigs of Irish yew from a neighbouring cemetery, with which a decoction was made, and two or three doses of this were taken by the woman, without, however, producing any perceptible effect. The decoction had been made by boiling about five or six ounces of yew in two quarts of water. Of this half a teacupful was taken on Monday evening, the 13th of last August. Two similar doses were taken the following day, the last being taken at night before going to bed. As no effect had been produced up to that time, some of the chopped-up unboiled leaves were taken with the last dose. At one o'clock in the morning the husband was awoke by his wife, who was retching, and complained of feeling ill. He gave her some cold water, went to sleep, and did not awake again until a quarter past two, when he found his wife breathing very hard. She slightly moved her head but made no reply to his questions, and being now alarmed he went for assistance. Dr. Günther attended soon afterwards and found her dead. The circumstances of the case, which were at once freely explained by the husband, being such as to implicate him in the commission of an illegal if not felonious act, they became subjects for investigation before the coroner, and also before a bench of magistrates.

The medical evidence was to the effect that the deceased when seen about an hour after death had a calm expression; that there was no distortion of the limbs, and no froth before the mouth. At a *post-mortem* examination, made thirty-three hours after death, there were no external marks of violence; the brain and lungs were perfectly healthy; the pericardium was firmly adhering to the heart—probably in consequence of former pericarditis. The heart itself was larger than normal, it was very flabby; on the right side was a large deposit of fat, which extended into the muscular substance; it contained no coagulum, only a small quantity of liquid blood. The liver was healthy. Both kidneys were very much congested; neither the uterus nor the fœtus were in any way affected by what had been taken; the stomach contained about three ounces of half digested food, and pieces of the cut leaves of the Irish yew. There were some red patches on the coats of the stomach, which, however, it was thought might have been caused by incipient decomposition.

Some doubt having arisen as to whether what was stated to have been taken by the deceased was really the cause of her death, I was requested by the magistrates, with the concurrence of the Secretary of State, to make an examination of the decoction, and of the stomach and intestines with their contents.

The decoction, as taken from the saucepan in which it had been made, consisted of three and a half pints of a brown liquid, in which were immersed the leaves and twigs used in making it. The latter bore the well-marked characters of the yew, as also did the former those of a decoction made as described.

The pieces of green leaves found diffused in the contents of the stomach were by comparison identified as portions of yew leaves. The inner surface of the stomach presented an appearance of slight inflammation all over it, and there were two patches more inflamed at the pyloric end. Just beyond the pyloric valve, in the duodenum, there was a compacted mass of digested green leaves, amounting to nearly half an ounce, and the intestine surrounding this mass presented a similarly inflamed condition to that which had been observed in the stomach.

The contents of the stomach and duodenum were tested for mineral and some of the more easily detected organic poisons, but none was found. The digested mass of leaves yielded to spirit and ether a product resembling the oleo-resinous matter similarly obtained from yew leaves.

There could be no doubt of the presence of yew leaves in the stomach, and that some of these had passed in a digested state into the intestines.

With the view of forming an opinion as to whether the quantity of yew leaves which appeared to have been taken by the deceased was sufficient to have caused death, I gave to a strong rabbit about fifty grains of fresh yew leaves. In five hours the animal was dead. It had apparently died without a struggle, for it was found in its natural sitting position with its head on one side on the floor of the hutch, and with no indication of its having suffered pain. The stomach presented the same appearance of slight in-

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, November 7, 1877.

flammation as had been observed in the stomach and intestines of the deceased woman.

The conclusion arrived at was that the deceased died from the effects of the yew leaves, aided probably by the previous condition of her heart.

In connection with this case, it may not be out of place here to allude to the reputed therapeutic effects of yew leaves. Pereira says that, "considered both in a toxicological and therapeutical point of view, the yew appears to hold an intermediate position between savin and foxglove. . . . It is said that when used for medicinal purposes it is unlike digitalis in not being apt to accumulate in the system." The yew appears to contain a volatile oil and also an amorphous alkaloidal substance which has been isolated under the name of taxine. It is probable that the oil gives it the property of savin, and the alkaloidal substance that of foxglove. The effects observed in the cases I have alluded to accord with previous observations, and seem to justify the anticipation that taxine may prove a valuable therapeutic agent. I am having some of it prepared with a view to further investigation of the subject.

[*The discussion on this paper is printed at p.* 375.]

SOME FURTHER REMARKS ON SWEET SPIRIT OF NITRE.*

BY F. M. RIMMINGTON.

In a former paper on this subject,† I stated that a spirit containing 4 or 5 per cent. of nitrite of ethyl is a fair standard of strength for medical uses, and on further reflection there are considerations of some importance why this should be the standard. The process of the Pharmacopœia has not in my hands yielded a spirit of this strength, although the chloride of calcium test implies this amount of ether.

Five per cent. is equal to one ounce by volume, in a pint. An ounce of HNO_3 is required to produce one ounce of nitrite of ethyl, or a pint of sp. æther. nitros.; and in the production of this ether about two ounces of spirit of ·835 specific gravity will be decomposed, and one ounce or more of water formed. These are the quantities that come out in practice, but several conditions may exist to change these results. It follows from the foregoing that there would be three grains (measure) of the nitrite of ethyl in sixty grains of such spirit, and if there be any analogy between the ethylic and the amylic ether, one would conclude that a drachm would be a full dose. It appears to me therefore undesirable, both from a medical and a commercial point of view, to have this preparation either stronger or weaker. How far does the spirit of nitre, which has been in common use amongst us for so long a period, approach this strength? From many samples which I have examined, some from most reliable sources, some contained only a fraction of one per cent., and others none at all; in one instance the spirit appeared to be only a weak solution of aldehyde, and in some instances the small quantity of ether that may at one time have been present had disappeared by decomposition accelerated by an excess of water.

The specific gravity is of some importance and ought not to be higher than ·845, and the question suggests itself to me, how the gravity of ·850 came to be so universally adopted by the trade as the proper strength? I think it may be accounted for in this way. By the old process which was generally followed by manufacturers, it was usual to draw over as much distillate as there had been alcohol put into the still; so that in the latter part of the operation there came over a very weak spirit, and it is my opinion the great proneness of this preparation to change is largely indebted to the presence of this water and some oxidized compounds that accompany it; the contents of the retort being in such a state of hydration as to be unable to form nitrite of ethyl.

We have all of us heard much about "rapid decomposition," the "excess of acidity," etc., of spirit of nitrous ether. The following experiments bear on these two points:

The following two examples had been put away in corked bottles, not quite full, and no particular pains bestowed upon them, and the corks had several times been taken out in the interval.

1st. A sample of spirit of nitre, made in March of this year, after the formula of 1746, contained at that time 18 per cent. of ether. On the 1st of November (being seven months old), I tried it again, to see what changes had taken place. It now yielded me 14 per cent. ether, and the acidity was equal to 0·182 per cent. nitric acid, or about one-half grain per fluid ounce.

2nd. A sample made about the same time after the Pharmacopœia of 1836, but the distillation continued beyond the point directed in the formula. It then contained 3 per cent. of ether—it now yielded 2 per cent. and the acidity was equal to ·367 nitric acid, or 1¼ gr. per fl. oz. So that this tendency to decomposition is not altogether inherent, *per se*, but to a great extent dependent on other conditions.

[*The discussion on this paper is printed at p.* 377.]

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, November 7, 1877.

† See before, p. 341.

NOTES ON CASUAL DRUGS.*

BY E. M. HOLMES, F.L.S.

Occasionally drugs which have no recognized value in England are sent over on speculation from foreign countries. These find their way into the dock warehouses at the principal ports, such as London and Liverpool, and if no commercial use is discovered for them, they remain in the warehouses until the expense of housing them necessitates their sale. Such sales are known as "rummage sales" and take place periodically.

Inasmuch as the drugs thus sent to English ports are in most cases of value, or at least are thought to be so in the countries from which they are exported, a short notice of them may perhaps present some points of interest.

At a sale of the kind alluded to, which took place last month, the following articles were noticed:—

Tamarisk Galls.—These small galls came from Mogadore. They vary in size from that of a pea to a horsebean, or more rarely reach the size of a small nut. The taste is powerfully astringent. Internally they are found to be full of small cavities, in which, however, the insect that forms them is very rarely found in a state to be examined. So far as I am aware the name of the insect has not yet been determined. The galls contain about 40 per cent. of a very pure tannin.

In Morocco these galls are known under the name

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, November 7, 1877.

of Tacout, and are produced upon the twigs of *Tamarix articulata*, Vahl. In India similar galls are produced upon *Tamarix Gallica*, L., and *Tamarix orientalis*, Vahl.; those of the former plant are usually rather larger, and are called Bara-mai in Hindostanee; the smaller ones, from *Tamarix orientalis*, being called Chota-mai. The Tamarisk galls of India also occasionally find their way into English commerce, and if better known would probably be largely used for tanning purposes.

A strong infusion of these galls has been recommended in India as an application to foul ulcers, and by the natives they are used in diarrhœa and dysentery.

CALOPHYLLUM INOPHYLLUM, *L.*—The fruits of this plant were imported from the Mauritius under the name of oil seeds. The fruits as imported consist of the hard woody endocarp. They are about the size of an English oak gall, nearly globular, with a small projecting point at one end, and contain a yellowish white oily kernel. According to the official report of the products in the India Museum, the seeds yield sixty per cent. of a fragrant green oil, fluid at ordinary temperatures, but beginning to solidify when cooled below 50° Fahrenheit.

In India it is used as a lamp oil and also as an outward application for rheumatism. Although apparently unknown in the commerce of this country in 1847–8, nearly 4000 gallons of the oil were exported from Madras to Ceylon and the Straits settlements. The tree yielding these seeds bears handsome white fragrant flowers, and it may not be out of place here to remark that there is a wide field for experiment among the native plants of India, for those interested in perfumery.

The following note extracted from Seemann's 'Flora Vitiensis' will show how highly the oil obtained from these nuts is esteemed in Fiji, as well as the method of extraction :—

"The most valuable oil produced in Fiji is that extracted from the seeds of this tree, the dilo of the natives, the tamarind of Eastern Polynesia, and the cashumpa of India. It is the bitter oil or woondel of Indian commerce. The natives use it for polishing arms and greasing their bodies, when cocoa-nut oil is not at hand. But the great reputation this oil enjoys throughout Polynesia and the East Indies rests upon its medicinal properties as a liniment in rheumatism, pains in the joints, and bruises. Its efficacy in this respect can hardly be exaggerated and recommends it to the attention of European practitioners. The oil is kept by the Fijians in gourd flasks, and there being only a limited quantity made I was charged about sixpence per pint for it, paid in calico and cutlery. The tree is one of the most common littoral plants in the group; its round fruits, mixed with the square ones of *Barringtonia speciosa*, the pine cone-like ones of the sago palm, and the flat seeds of the walai (*Entada scandens*, Benth.), densely cover the sandy beaches. Dilo oil never congeals in the lowest temperature of the Fijis, as cocoa-nut oil does during the cool season. It is of a greenish tinge, and very little of it will impart its hue to a whole cask of cocoa-nut oil. Its commercial value is only partially known in the Fijis and was found out accidentally. Amongst the contributions in cocoa-nut oil which the natives furnish toward the support of the Wesleyan missions some dilo oil had been poured, which on arriving at Sydney was rejected by the broker who purchased the other oil, on account of its greenish tinge and strange appearance. On being shown to others a chemist recognizing it as the bitter oil of India purchased it at the rate of £60 per tun, and he must have made a good profit on it as the article fetches £90 a tun.

"In order to extract the oil the round fruit is allowed to drop in its outer fleshy covering and rot on the ground. The remaining portion, consisting of a shell somewhat of the consistency of that of a hen's egg, and enclosing the kernel, is baked on hot stones in the same way that Polynesian meat and vegetables are. The shell is then broken, and the kernels pounded between stones. If the quantity be small the macerated mass is placed in the fibres of the vau (*Hibiscus tiliaceus* and *tricuspis*), and forced by the hand to yield up its oily contents; if large, a rude level press is constructed by placing a boom horizontally between two cocoa-nut trees and appending to this perpendicularly the fibres of the vau. After the macerated kernels have been placed in the midst, a pole is made fast to the lower end of the fibres, and two men taking hold of its end twist the contrivance round and round till the oil collecting into a wooden bowl placed underneath has been extracted. Of course, the pressure thus brought to bear upon the pounded kernels is not sufficiently great to express the whole of the oil and there is still much waste."

BOOMAH NUTS.—These are the fruits of *Pycnocoma macrophylla*, Benth., a small tree belonging to the *Euphorbiaceæ*. These fruits were imported from Natal under the name of galls, probably on account of their bearing a strong resemblance to Aleppo galls in shape and size. Externally they have a black colour, and when broken open exhibit a hard three-celled endocarp, each cell containing a single seed. The seeds in shape and colour are not unlike a castor oil seed, but are less than half the size and have no appreciable taste.

The Boomah nuts are said to be used for tanning in Natal. The tannin is contained in the outer coat or sarcocarp, and must be very small in amount, considering the size of the fruit, since so large a portion is occupied by the woody endocarp. These nuts are not likely, therefore, to be able to compete in this country with other tanning materials.

BAROSMA ERICIFOLIA, *Andr.*—This drug is a species of buchu leaves. The leaves are very small, resembling in size and shape the leaves of the heath, whence the specific name. The odour of the leaves is powerful, but differs somewhat from that of the official species, having a slight resemblance to the odour of caraways. These leaves are used by the Hottentots in the same way as the official kind, and also as a perfume, and in the form of tincture as an application to wounds.

EMPLEURUM SERRULATUM, *Ait.*—The leaves of this plant are mentioned in 'Pharmacographia' as being offered for buchu in this country. The characters pointed out in that work render it an easy matter to distinguish it from the leaves of *Barosma serratifolia*, Willd. the species which it most closely resembles. One feature, however, not noted in that work, is very easily observed. When a leaf of *Barosma serratifolia* is held up to the light the lateral veins are seen to be much straighter, longer, and more strongly developed than in the leaves of *Empleurum serrulatum*.

LOOMOONDERFALL.—The large fruits which bear this name were imported from Zanzibar, and are, I am told, possessed of properties similar those of cocculus indicus. I have not as yet been able to ascertain the name of the tree which produces them.

CASSIA TORA, *L.*—These seeds were imported under ths name of Fantupa seed. They are about the size ot an apple pip, greenish brown, polished, pointed at one end and irregularly angular. The leaves of this plant are used in India for ringworm, and the seed of another species (*Cassia absus*, L.) has been used in purulent ophthalmia, but the object with which the seeds of *C. Tora* were sent to this country, I am not able to conjecture.

[*The discussion on this paper is printed at p.* 378.]

HOANG-NAN BARK.*

BY M. PLANCHON.

Under the name of hoang-nan bark, the missionaries at Tong-King have for some time past spoken highly of a drug which they report to be very valuable in the treatment of hydrophobia and leprosy. It is described as being yielded by a shrub presenting some analogy with the ivy, occurring on the Ngan-Ca mountains in Nghé-An, and in the province of Than-Hoa, particularly on calcareous soil.

A specimen of this bark having come into the author's possession, he submitted it to examination. It consisted of small fragments that had been detached from the tree by clean incisions, which at the lateral edges had been made in the direction of the axis of the tree, but at the top and bottom edges in a very oblique direction, forming parallelograms 1 to 3 centimetres high, 4 to 5 centimetres wide, and 1·5 to 2 millimetres thick. In consequence of the oblique form and the tendency of the bark to curl, the pieces frequently had a spiral form.

The external surface of the bark is more or less verrucous, sometimes blackish-grey, marked with grey and black, or brownish, but more frequently an ochreous red tissue forms the superficial layer. The inner surface varies in colour, being sometimes pale tawny-grey, sometimes darker and approaching a blackish-brown, and always striated longitudinally. The fracture is not fibrous, and shows two distinct layers separated by a clear line that is paler than the rest of the tissue. Nitric acid colours the internal portion blood-red, and the ochreous tissue blackish-green, but when applied to the transverse fracture it scarcely colours the characteristic pale line. The odour of the bark is not marked, but the taste is very bitter.

Examined anatomically from the exterior to the interior, four distinct layers are seen, viz.:—

(1) A suberous layer, formed of radiating lines of thin-walled rectangular cells, flattened from without inwards, reddish externally and paler in the interior. The thickness of this layer is variable; sometimes there are as many as twenty rows of superposed cells, with a mean thickness of 0·3 to 0·4 millimetre.

(2) A parenchyma layer having the same average thickness as the preceding. The cells are elongated tangentially, and the walls are rather thin. Sometimes they contain a yellowish-brown matter, and many of them contain crystals of oxalate of lime. Here and there in the internal portion of this zone are small isolated thick-walled cells that seem to prepare the way for the following one.

(3) The third layer is clearly characterized by the sclerogenous cells of which it is constituted. These cells have very thick walls, yellowish-green by transmitted light, traversed by small canals, and leaving only a small central cavity, which is generally filled with a brownish matter (? resinous). It is this third zone that forms the pale line above referred to; it has a thickness of about 0·015 millimetre.

(4) The fourth, or liber layer, is the thickest of the whole, being twice as thick as the others united. Under the glass it shows a structure rather irregularly striated radially. This is due to the presence of medullary rays, formed of four or five rows of rounded polyhedral cells having thin walls. The remainder of the tissue is formed of two kinds of cells; one kind elongated in the direction of the vertical axis, and containing small (0·003 m.) ovoid, nearly round grains of starch; the other kind much shorter, but placed one above the other so as to border the preceding, and each containing a rhomboidal prism of oxalate of lime. In the outermost rows of this zone are a large number of sclerogenous cells, forming isolated groups; these occur here and there, but less numerously, in the remainder of the zone.

The above, which are the salient characters of the hoang-nan bark, indicate a very close relationship, if not identity, with false angustura bark. The ochreous tissue coloured blackish-green by nitric acid, the red coloration of the inner layer by the same reagent, and the general appearance of the section with its characteristic pale line, are all indications of this affinity. This is confirmed by the anatomical characters, the same structure in the suberous tissue and in the subjacent parenchymatous tissue, the same sclerogenous zone, and the same general disposition of the liber layer. Further, M. Wurtz has obtained, by chemical analysis of the hoang-nan bark, strychnine and brucine, the two alkaloids of false angustura.

The most striking point of difference between the two barks are the following:—The exterior appearance of the hoang-nan bark is much more regular than that of the false angustura. It is more distinctly curled, much thinner, and presents a verrucous exterior surface. In a transverse section the radial striæ of the liber zone are less clearly indicated. Also, in the liber zone of the hoang-nan bark there is a very small number of sclerogenous cells, whilst they abound in the liber zone of the false angustura and are developed longitudinally. In a pamphlet by M. Lesserteur, entitled 'Du traitement de la rage et de la lèpre par le Hoang-Nan,' published at Lyons, it is stated that "the bark is covered by a reddish powder, which contains a subtle poison that constitutes the virtue of the remedy. Only this powder is employed and not the ligneous portion of the bark, which has no efficacy." M. Planchon considers that the powder is evidently analogous to that which is found upon false angustura bark, and remarks that Pelletier in examining that bark found the principles contained in the suberous tissue quite innocuous. He suggests therefore that the above statement is probably incorrect, and that it is the part of the bark containing the strychnine and brucine that would produce the symptoms reported by the missionaries, which would be explained by the presence of those alkaloids.

* From the *Journal de Pharmacie et de Chimie* [4], vol. xxv., p. 384.

THE FLORA OF CENTRAL NORTH AMERICA.

Sir J. D. Hooker thus sums up the results of his and Dr. Asa Gray's joint investigation, together with Dr. Gray's previous intimate knowledge, of the elements of the American flora:—The vegetation of the middle latitudes of the continent resolves itself into three principal meridianal flora, incomparably more diverse than those presented by any similar meridian in the old world, being, in fact, as far as the trees, shrubs, and many genera of herbaceous plants are concerned, absolutely distinct. These comprise two humid and one dry intermediate region, each of these three regions being again divisible into three sub-divisions, as follows:—(1) The Atlantic slope plus Mississippi region; sub-divided into (α) an Atlantic, (β) a Mississippi valley, and (γ) an interposed mountain region with a temperate and sub-alpine flora. (2) The Pacific slope, sub-divisible into (α) a very humid cool forest-clad coast range, (β) the great hot drier Californian valley formed by the San Juan river flowing towards the north, and the Sacramento river flowing to the south, both into the bay of San Francisco, and (γ) the Sierra Nevada flora, temperate, sub-alpine, and alpine. (3) The Rocky Mountain region (in its widest sense, extending from the Mississippi beyond its forest region to the Sierra Nevada), sub-divisible into (α) a prairie flora, (β) a desert or saline flora, and (γ) a Rocky Mountain proper flora, temperate, sub-alpine and alpine. The difference between the floras of the first and second of these regions is, specifically and to a great extent generically, absolute; not a pine, oak, elm, maple, plane, or birch of Eastern America extends to Western, and genera of thirty or fifty species are confined to each. The Rocky Mountain region again, though abundantly distinct from both, has a few elements of the eastern region and still more of the western.

The Pharmaceutical Journal.

SATURDAY, NOVEMBER 10, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal. MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE AMENDED BENEVOLENT FUND REGULATIONS.

FROM the report which will be found in a subsequent page it appears that at the meeting of the Council, on Wednesday last, the attention of the members was principally devoted to the consideration of two questions, the advisability of allowing ladies the privilege of joining the Pharmaceutical Society, and the amendment of the regulations according to which the Benevolent Fund is administered. As the first of these questions is again remitted to the Annual General Meeting to decide it need not be discussed here, but it may be of service to point out what are the principal alterations in the Benevolent Fund regulations that will come into operation at the commencement of the year now close at hand.

The first amendment occurs in clause 2, relating to the time for deciding the number of annuitants to be elected and the time of election. Hitherto, the consideration of the expediency of electing pensioners, and the decision of the number, if any, to be elected, have come before the Council in June and the elections have taken place in the October following. The consequence has been that a few persons have suffered a disadvantage, as subscriptions and donations given during November and December have been too late to secure to the givers votes for the current year, and have not entitled them to votes in the next year. The election is now to take place in December, or coincident with the close of the financial year of the Fund, so that no votes need be lost in future on that account. Moreover, as the decision of the Council is also to be postponed till October, the interval between that and the election will be decreased from four to two months, which may possibly prove to be a boon to the candidates as shortening the time during which they are tempted to spend ill-afforded money in canvassing.

The next alteration is in the fourth clause, and is a partial realization of the hope expressed by the President at the Dinner in aid of the Fund in May last. In future the annuity paid to each pensioner who is sixty-five years of age and upwards, will be at the rate of £35 per annum; but the annuitants under that age will receive the same as at present, namely £30. As just remarked this is not quite all that was suggested by the President in May, and it would appear to be a considerable modification of the original proposition brought under the notice of the Benevolent Fund Committee, but it will nevertheless involve an increased permanent charge that will require to be borne in mind by the philanthropic contributors to the Fund.

A third alteration is one that has already, to some extent, been anticipated in practice. It empowers the Council in the case of an orphan, not only to provide, as hitherto, but also to "*assist in providing* a home for the child by purchase in one of the public asylums for orphans." On more than one occasion the Council has voted money to be applied in securing the election of a candidate in which it was interested; it is desirable, therefore, that its power to do so should be clearly indicated in the Regulations. It is manifest, however, that considerable discretion will be required, and doubtless it will be exercised, as to the manner of giving this assistance, so that it may never tend to foster the evil of charity-mongering that has more than once been denounced at the Council table.

The next alteration of importance is the introduction of an entirely new clause, which will no doubt receive the unanimous endorsement of the subscribers and donors to the Fund. It is to the effect that should any subscriber or donor, or the widow of any subscriber or donor, become a candidate for an annuity, such number of votes shall be placed to his or her credit, at the succeeding election, as shall be represented by the whole amount of subscriptions or donations to the Benevolent Fund he or she (or in the case of a widow her husband) may have contributed. The justice of such a regulation can hardly be impeached, and its adoption, it may be hoped, will help to secure a still more extended interest in the Fund amongst the whole body of chemists and druggists.

The last alteration that need be referred to is the introduction of a clause giving to persons entitled to vote, but residing abroad, the privilege of voting by proxy. The only conditions are that the person to whom the proxy is entrusted shall himself be a person entitled to vote in his own behalf, and that his name and address shall have been previously communicated to the Secretary.

The above appear to be all the amendments that will practically affect the administration of the Fund, the others consisting chiefly of verbal alterations and rearrangements of the clauses. We think that they may fairly claim to be considered amendments in the true sense of the word, and that it will be admitted they are calculated to promote the interests of the Fund which the Council has so long and so ably administered.

NOTES FROM BRAZIL.

A correspondent who has recently returned from Brazil gives some interesting information respecting the position of the pharmacist in that country, according to which it would appear unlikely that any of those burning questions could arise which are now agitating the minds of certain classes of pharmacists and medical practitioners at home. These things are managed better in Brazil, and with regard to all medical and pharmaceutical matters the Government adopts a rigid system. Medical practitioners are not allowed to dispense, except in special cases, and then only under a licence from the Government. In like manner the pharmacist, whose particular business is to dispense the prescriptions of medical practitioners, is very properly required to pass an examination, and in order to open a "botica" must first obtain a licence from the Government.

The consumption of proprietary medicines in Brazil is said to be very large, many of them being imported from Europe, while a still larger quantity are prepared in the country, and sold with counterfeit English or French labels! This fraudulent practice is ascribed to the excessively high import duties. The Government requires a declaration as to the contents of proprietary articles, to be made, under due guarantee of secrecy, to the sanitary authority at Rio, entitled Junta Central de Hygiene Publica. These regulations contrast strongly with unrestrained practices prevailing in the United States; but as Brazil is in many parts a very scantily populated country, they cannot be very strictly enforced everywhere, and in small towns, no less than in the backwoods, things are done more by natural selection than by Government rules.

A tincture of eucalyptus globulus is prepared on rather a large scale on Brazil, where intermittent and remittent fevers are very prevalent in the low lying districts on the coast and near the rivers, and this tincture is much used by medical men in the treatment of these fevers.

CULTIVATION OF THE IPECACUANHA PLANT.

Upon the first introduction of the ipecacuanha plant into India, great hopes were expressed that it would soon become as successfully established as the species of cinchona. Experience, however, has shown that ipecacuanha is not entirely and absolutely suited for general cultivation in our eastern possessions.

The best and most trustworthy information on this subject, has been obtained from the several annual reports of Dr. King, the Superintendent of the Botanic Garden, Calcutta. It seems that during the year ending June, 1877, plants of the ipecacuanha were distributed from Calcutta to Ceylon, Singapore, Burmah and the Andamans. But Dr. King expresses an opinion that owing to its remarkably slow growth ipecacuanha will not be largely cultivated in India especially by European planters who naturally regard with but little favour crops that yield slow returns. Besides this the unattractive and straggling nature of the plant is not calculated to excite interest among planters. "These facts," Dr. King says, "make it still more a matter for regret that the profitable cultivation of ipecacuanha as a crop at the cinchona plantation seems so hopeless, owing, as I have stated in former reports, to the cold of the winter season, even in the warmest valleys, being too great for a species so thoroughly tropical."

It appears also that the cultivation of vanilla, like that of ipecacuanha, affords but little hope of its general cultivation as a profitable crop. Indeed Dr. King reports thus decidedly:—"I am more than ever confirmed in my opinion that the establishment of vanilla culture as a profitable industry in Bengal is not hopeful."

EXAMINATION RESULTS IN GERMANY.

An official summary of the examinations conducted under the Prussian Ministry of Education, for the licence of general medical practice, either at the Central Board of Berlin or at the Provincial Boards in the University towns, during the examination year of 1876-77, shows the following results: Of 346 candidates who went up for examination, 276 passed, and of these 220 received the character "good," 49 "very good," and 7 "excellent" (vorzueglich gut). 70 candidates failed to acquit themselves satisfactorily or withdrew spontaneously, that is, nearly the third part of the whole number. At the pharmaceutical examinations for the licence of dispensing chemist, 165 candidates presented themselves, of whom 155 passed, viz.; 40 with the character "sufficient," 97 with "good," 18 with "very good." 10 pharmaceutical candidates withdrew, or could not pass. The much larger proportion of failures at the medical examinations might be accounted for by more severe demands, but the lesser proportion in the pharmaceutical test evidently has its cause in the more practical requirements of these candidates and their having, previously to an eighteen months' course of theoretical University lectures, served a three years' apprenticeship in a dispensary and its laboratory.

TEACHING OF PHARMACY IN THE UNIVERSITY OF BERLIN.

It is announced that a pharmaceutical school, in which pharmacological, physiological, and chemical researches on the materia medica will be carried on, is to be commenced in the University of Berlin. The Prussian Government is about to erect a building for the laboratory, and the school is to be under the direction of Professor Oscar Liebreich.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, November 7, 1877.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atherton, Atkins, Betty, Bottle, Churchill, Cracknell, Gostling, Greenish, Hampson, Hanbury, Hills, Owen, Rimmington, Robbins, Sandford, and Shaw.

The minutes of the previous meeting were read and confirmed.

The following being duly registered as Pharmaceutical Chemists were respectively granted a diploma stamped with the seal of the Society :

Bayston, George Coryndon.
Betty, Robert Brown.
Blunt, Thomas Porter.
Cluett, Benjamin.
Dear, Theophilus.
Fell, John James.
Gorrie, Daniel.
Nicholson, Richard.
Peirson, Henry.
Robinson, William Prior.
Savory, Arthur Ledsam.

ELECTIONS.

ASSOCIATE IN BUSINESS.

Samuel Eliott, jun., of Plymouth, having passed the Minor examination, being in business on his own account, and having tendered his subscription for the current year, was elected an "Associate in Business" of the Society.

ASSOCIATES.

The following having passed the Minor examination, and having tendered or paid (as apprentices or students) their subscriptions for the current year, were elected "Associates" of the Society :—

Minor.

Barfoot, John Richard Doughty. Chesterfield.
Bell, John Waller.................Todmorden.
Bessell, James Walter...........Ludlow.
Carter, Henry Ayling ....Winchester.
Clower, John ....Nottingham.
Corden, Frederick W. W. ......Streatham.
Cousens, John Stather...........Hull.
Cridland, Francis E. J. ....Devizes.
Dyer, Edward Henry ....Horncastle.
Godsell, Philip George ....Great Malvern.
Hugill, John Howden...........Edmonton.
Keith, John ....Forres.
Kendrick, Alfred ....Limehouse.
Lakeman, Stephen ....Norwich.
McNaught, Louis A. ....Dumfries.
Matthews, John Henry ....London.
Newbery, Frank ....Lambeth.
Roberts, David Prosser ....Hereford.
Savory, John Field ....London.
Taylor, George ....Brinsley.
Whitlock, Draycott K. ....Southampton.
Wooldridge, Elijah ....Cradley Heath.

Modified.

Bloxham, William Eagleston ...Oxford.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary examination, and tendered their subscription for the current year, were elected "Apprentices or Students" of the Society:—

Crummy, Thomas.................Douglas.
Grieve, Charles Frederick ......Edinburgh.
Pocock, Wm. Fred. Henry......Cape Town.

The names of the following persons were restored to the register of Chemists and Druggists :—

Thomas Hughes ....4, Ogwen Terrace, Bethesda.
Benjamin Johnson.18, Long Causeway, Peterborough.

The names of two ladies who had passed the Minor examination, and had applied to be elected Associates of the Society, were submitted to the Council.

Mr. HAMPSON said he would move that the ladies seeking election be elected, and, not having been present last month when this question was last discussed, he would like to say a word or two upon it. He did not quite understand what took place then, but believed a motion was made and subsequently withdrawn that the subject should be again brought before the annual meeting. The matter was therefore really in the hands of the Council for decision now. As members of Council, it was their duty to elect all eligible persons, irrespective of sex. He could quite understand there might be some delicacy in electing ladies who had not passed the examinations, but who from some accidental circumstances were in business, but the case here was very different. The lady whose case was discussed last month had passed her examination with very great credit, and was now in business, struggling with the world, and he thought they ought to render her every possible assistance the Society could afford. Probably no member of the Council would deny that there was a certain amount of advantage in being connected with the Society, and if they wished to do right they ought to hesitate before refusing admission to the Society, and so far depriving the lady of any advantage she might thus obtain. He understood that the two ladies on whose case they had to decide now had passed their examinations with great credit.

The PRESIDENT said they stood the highest on the day on which they were examined.

Mr. HAMPSON submitted the ladies had a claim on the Society to be elected. The Council might not be legally bound to elect them, because it had the power of refusal, but he thought it was bound in equity to do so, and it was with him a matter of conscience. He felt that if any ladies did embark in the business of pharmacy the Council ought rather to hold out a hand to them than throw any obstacle in their way. The two ladies in question and those who had been refused before were a credit to pharmacy, and it did not seem right that they should be debarred the use of the library and museum except on sufferance, thus denying them facilities for further advance in the occupation they had adopted. But they were told that if they did enter the school and lecture room they should be there as individuals, as it were, outside the pale and not as real pharmacists. He hoped that without further hesitation the members of the Council, feeling their responsibility, would decide to elect them almost, if not quite, unanimously. What was there to fear? He knew that at an annual meeting some years ago, when there were a great many young men in the background, there was a vote, which he denied was a reflection of the Society's opinion, somewhat adverse to the admission of women, but the Council had scarcely any right to consult an annual meeting on such a question. It had a duty to perform as the executive ; any person eligible was admissible, and there was no doubt the ladies in question were eligible and ought to be admitted without any further comment. If the Council refused to do so, it would only show the world that it did not keep pace with the nineteenth century.

Mr. HANBURY, as he had voted against the admission of ladies as members, wished to say that he thought there was a difference in the present case, as they were only seeking admission as associates. He did not want ladies as members of the Council or as office holders, but he could not see any objection to their being associates.

Mr. GREENISH had much pleasure in seconding the motion. On the last occasion he had moved that Miss Clarke be elected, but the feeling seemed to be that the

Council was bound by the decision of the general meeting. He was, on the contrary, decidedly of opinion that that general meeting did not represent the general feeling of the Society on the subject.

The VICE-PRESIDENT said the Council could not go back to the case decided last month, but with respect to the two ladies whose names were now before it, he was present when they passed their examinations, which they did most successfully, and what was very remarkable was that they surpassed all others in chemistry and attained the highest numbers by far of any examined on that day. The minimum number of marks being 600, one obtained upwards of 800. It did seem to him a most extraordinary thing that ladies who had so distinguished themselves should be debarred, not of any real substantial privilege, because they could not be prevented carrying on business, but merely of an honour and distinction which they had fairly earned.

Mr. SHAW said unfortunately he was not present at the debate last month, but he had read the report in the Journal, and was certainly surprised to find that the circumstances of having referred the question to an annual meeting three or four years ago was still one of the barriers to its being reconsidered. He submitted that the Council had no power to delegate any of its duties to an annual meeting under any circumstances. It might as well consult the Society at large with regard to the admission of honorary members, or as to additions to the schedule of poisons, or anything of that kind. He submitted that what was done at that time was simply an act of consultation with the members generally, and did not remove the responsibility of the Council and its right to act afterwards, if it thought proper; most certainly any action or delegation of duty at that time could not bind all future Councils. The bye-laws showed that parties, being eligible, on being proposed and seconded should be elected. He believed that many who voted at the annual meeting referred to were under the impression, though a mistaken one, that they were voting on the question of admitting ladies into the trade, and not membership of the Society. The Solicitor had already stated most positively that a registered chemist and druggist had a right to be elected. He was glad to see the view taken by the President at the last meeting, that the general meeting had no right to over-rule the action of the Council. Mr. Sandford, although he was not favourable to the election of ladies when the Pharmacy Bill was passed, stated that all eligible chemists and druggists would have a right to become members of the Society, and, acting on that principle, he thought ladies had a right to be elected. It had been said that this was a private Society, but he could not admit that that was the case, since it was now performing public functions, receiving fees, appointing examiners, keeping a register, and performing other public duties under the Pharmacy Act. He therefore submitted that the Society was no longer a private one in the same sense as it was formerly.

The PRESIDENT reminded the Council that if it elected these ladies as associates when they came up and passed the Major examination it could hardly refuse them membership.

Mr. ROBBINS thought the question was now becoming an important one. Mr. Shaw said the Council was not bound to act by the decision of a general meeting, but he considered that if the Council had consulted a general meeting it was so bound, and he should like reference to be made to the resolution then passed to see how it was worded. He contended that whatever that resolution was the Council was bound by it until it was rescinded, and then no doubt Miss Clarke and the other ladies would be admitted at once. His view was, that so long as a resolution of the annual meeting stood in the books unrepealed it was equivalent to a decision of the Council.

The PRESIDENT could not agree with that view. The Council appealed to the general meeting for advice and assistance, but it was left to the executive of the Society to do its duty, because it had information which a general meeting never could have. Therefore, although the Council applied to the general meeting for advice,—and that advice might be very valuable and have great weight,—he still must maintain that the Council could not delegate its duties to the general meeting.

Mr. ROBBINS said he must ask that the opinion of the Solicitor be taken on this point, as there was such a difference of opinion existing upon it.

Mr. OWEN said the general meeting elected the Council, which Council was supposed to represent the members as far as their consciences went, and no further. He should be very sorry to be sent to that Council to vote according to any general meeting whatever. Times were altering very much, and though he had always voted against the election of ladies, perhaps without consideration, he had now changed his view altogether, and thought the time had arrived when the Council should look at this question in its true light. He could not conceive what injury would in any way accrue to the Society when two ladies had come forward and distinguished themselves above all the other candidates, if they were elected as associates, and thought it would be a disgrace to the Society to refuse them. He therefore acknowledged openly he was a convert and should vote with all his heart for the election of these ladies.

Mr. BETTY said the Council had heard a great deal lately of the deterioration of commercial morality, and he was very sorry to find at that table an instance which he thought would surpass in extravagance any exhibition of inconsistency and want of faith and political morality which it had been his lot to observe in the columns of any newspaper for the last twenty years. If there was such a thing as political consistency and administrative honesty that Council was as much bound by it as any man was bound to his wife when he had entered into a marriage contract. He would impress on the Council that it was bound in honour, consistency, and morality to carry out its own promise, and he was very sorry to see certain gentlemen because they had changed their opinion change their mode of reasoning. The position in which they stood was this, that they had deliberately, on account of the difficulty they found in deciding this question amongst themselves, placed it for adjudication in the hands of the general meeting; it was not raised by accident, but deliberately put forward by the then Council, a great majority of whom were still members of the same body. It was very well to stand up for the independence and dignity of the Council, but the annual meeting having expressed the sense of the body at large, that ought not to be put on one side. They could not now sit as judges in their own cause and say they would ignore the deliberate action of the meeting because it was now in their power to rescind that vote. He did not argue that that decision was final, but he did say that the only constitutional and right way to arrive at a different conclusion would be to place the matter again before the annual meeting that the members might rescind the vote which they then passed. The argument had always prevailed amongst the members of the Council that they were morally bound to consult their constituents. He had heard gentlemen say in that room that they were not aware of those former proceedings, but now they did know of course they would abide by that decision until it was reversed; and the most straightforward plan would be to give notice to rescind that vote by the members at large. The annual meeting had as much right to have its vote brought before it again as it had to pass it in the first instance, and as the Council had thought it its duty to bring the matter before the annual meeting, it appeared to him equally clear that the annual meeting should have the opportunity of confirming or rescinding its vote.

Mr. ROBBINS referred to the charter of incorporation, page 149, in the Calendar of the Society for the present year, which stated that general meetings of the Society should be held from time to time, and that the said general meetings and the Council should have the entire direction and management of the Society, in the manner and subject to the regulations thereinafter mentioned.

The PRESIDENT said that was to be explained by the bye-laws.

Mr. SANDFORD was very much surprised to find this proposition again before the Council, it having been so much discussed at the last meeting: he did not mean the general question of the merits of ladies, but the power of the Council to elect them as members of this Society. It was quite understood, if not resolved, at the last meeting that the question would be referred to the next general meeting. The members of the Council sat there as the executive and delegates of the Society. This question was not a mere matter of routine work which could not be settled by the Society at large; if there was one point which should be referred to the members it was the constitution of the Society itself—whether it should consist of men alone, or of men and women. The general meeting having expressed such a decided opinion he thought the Council would be behaving most unfaithfully and improperly if it now proceeded to elect ladies without the consent of the general body. The Vice-President had most enthusiastically described the qualification of these ladies, but that was not the point in question. Mr. Shaw said that every man had a right to be elected, and Mr. Hampson said the Council was bound to elect everybody who applied. On the contrary, he (Mr. Sandford) said the Council was bound to consider the application of each person, but was not bound to elect him. Each one had a right to be elected if there were no disqualifying circumstances, but in this case there was a disqualifying circumstance, namely, that of sex. Mr. Hanbury said the Council might elect ladies as associates; but it could not, having done so, refuse to elect them as members; and if they were elected as members he could not see why they should not be members of the Council, or why one of them should not become President. He held that it would be most inconsistent to act in opposition to the determination arrived at last month, which would be running counter to the view of their constituents, to whom he looked for guidance in such a matter. The members of the Council were constantly told they must consider their constituents outside, and in this particular case where they knew that a strong opinion had been expressed that ladies should not be elected, he did not think the Council ought to take the matter in its own hands and elect them even as associates.

Mr. BOTTLE said he believed the general meeting referred to took place in May, 1873.

The PRESIDENT said it would be important to know who brought the subject before the general meeting; whether it was really the act of the Council or a private act. He had almost forgotten the circumstance, although he remembered very well the vote being taken.

Mr. RIMMINGTON said it was a very large meeting.

Mr. SHAW thought it would be well if the resolution of the Council were referred to.

The SECRETARY having referred to the minutes for 1873, said that a resolution was passed in February of that year, "That the question of the election of three ladies as apprentices or students of the Society be deferred until the meeting of the Council in June next," the intention being to refer it to the annual meeting in the meanwhile.

Mr. ATKINS thought the Council was, strictly speaking, an executive and not a legislative body, and he did not know that it had the slightest right to initiate any great organic change without consulting its constituents. It might be said that the annual meeting was not a fair representation of the body of pharmacy, and there was some truth in that, which he regretted, but it was the only means at present existing for testing the sense of the community on any great question. He did not think it was in the power of the Council, however strong the views of its members might be (and he confessed his own were growing stronger every year in favour of admitting ladies), to carry into execution an important organic change without consulting its constituents. He would suggest that distinct attention should be drawn throughout the country to this question, and that the Council should endeavour to elicit a distinct expression of opinion whether ladies were or were not to be introduced into the Society. He felt great reluctance in voting for a proposition which had been rejected at an annual meeting, but it would be better perhaps not to argue the question. It must, however, be distinctly understood that the Council had no power to bar the entrance of ladies to the trade; the simple question was, whether it would or would not admit them to the honours of pharmacy. As had been pointed out by the President, if ladies were elected as associates they could not be refused admittance to full membership hereafter.

The PRESIDENT thought the wisest course would be to refer this matter again to the annual meeting, calling attention to it in the report of the Council, and so elicit an expression of opinion upon it.

Mr. BOTTLE said he must confess that he viewed this question differently now to what he did a few years ago, but he also looked upon the decision of the annual meeting as binding on the Council at present, if anything was to bind it at all. In the earlier part of the year 1873 this matter was discussed at the Council, when opinion was evenly balanced, and the then President gave a casting vote against the admission of ladies, or rather for the purpose of handing it over to the meeting of the June Council, so that the question might go to the annual meeting. When the annual meeting took place the question was most distinctly raised, and there the Society had the benefit of the Solicitor's opinion, when he certainly raised the question as to whether the Society had power to admit ladies; in fact he thought it had not that power, and that if any male member chose to raise the question by *mandamus* the Society would be in a very awkward position. It therefore seemed to him most desirable that further opinion should be taken before attempting to move in the direction in which circumstances no doubt were tending. He must admit himself that he felt flattered that these two ladies had passed such an examination, and that there was great difficulty in excluding such ladies from the Society. But, on the other hand, he felt more strongly bound by the decision of the Society at large as expressed at the annual meeting in 1873. He found that no one had the courage to reopen the question at the June meeting of Council, though he had not time to discover whether or not it was done at the July meeting. On the whole, he hoped this matter would be allowed to stand over until the next annual meeting, when it might be fairly discussed, and, if the Society at large were then prepared to admit ladies, he certainly should not oppose it. But he did hope the Council would be consistent, and that having referred a matter which it felt of grave importance to the members, it would be guided, to some extent, by the decision arrived at.

Mr. GOSTLING said he would move—

"That having referred the question of the admission of ladies to the annual meeting of 1873, and such meeting having decided against such admission, this Council resolves to appeal again to a general meeting before admitting ladies to the privileges of associates or members."

The PRESIDENT said he should not accept an amendment on the question before them, it must be decided one way or the other, but Mr. Gostling's motion might be taken as a resolution afterwards.

Mr. HAMPSON in reply said he should be the last man to do anything unconstitutional. He felt that the annual meeting referred to had a certain weight, expressing a certain conviction or sentiment on the question, but it was now several years ago, and he might also say that the Council at the time did not deliberately send the question to the decision of the annual meeting, it simply waited until the annual meeting was over. He had been told by Mr. Betty and by Mr. Sandford, that it was a deliberate request of the Council to know the views of the annual meeting, but he utterly denied this. There was nothing of the kind. It was simply this, that the Council, strangely enough, could not make up its mind on a simple question like this, and had to wait until the annual meeting had expressed its views. He, of course, should be the last person to undervalue the voice of a general meeting, but since that event there had occurred important elections of members of Council, and he, and those who thought with him, had rendered themselves somewhat obnoxious on this question to certain members, but those views had not proved to be obnoxious to the members at large, since those who held them had been returned more than once, and he felt that they represented the country on this matter. The question had in this way been referred to the constituencies, and if the members at large thought the question so important they would have refused to return a possible or probable majority in favour of this line of action, but they had not done so. He also took exception to the strong language used by Mr. Betty as to the morality of the case. He felt that the morality was on the other side, and that the Council was doing an act of injustice by refusing admission to these persons; that an evil thing was being done, and the sooner it was rectified the better, inasmuch as those female members of the trade who desired to enter the Society were placed at a disadvantage. They knew that in some parts of the country the term "Member of the Pharmaceutical Society" carried more weight than the simple designation of "Pharmaceutical Chemist." And the Council therefore did an injustice in preventing any lady from using that addendum to her name. He hoped that it would act as a faithful executive in this matter. There was no organic change, and no attempt to alter the character of the institution, it was simply a fulfilment of the conditions set forth by the charter. In reply to Mr. Bottle, when he referred to the opinion of the Solicitor, he must take this exception to it, that that gentleman interpreted the Act as being favourable to women having the right to be examined, and he did not think the Solicitor's words would bear the interpretation Mr. Bottle had put upon them. More than that, some four or five years ago when he brought this question before the Society individually, he took the trouble to get counsel's opinion upon it, and he was told most distinctly that it was within the power and functions of the Council, as an executive, to elect such members. If it thought, at any time, that any individual proposed was ineligible from any cause, it did not refer the question to the annual meeting, but simply refused to elect him, and he hoped, therefore, the Council would act as executive, and pass the resolution.

The President suggested that Mr. Hampson should withdraw the motion because he did not think it would be carried, and it was a pity that a vote should be taken against these ladies. It would be much better to let the question stand over until the next annual meeting, when attention should be directed to it, and then the Council would feel justified, perhaps, in electing ladies.

Mr. Hampson said he should like the general meeting to have some idea as to the views of the Council on the matter, because he believed there was a majority in favour of the general question. He would withdraw the motion provided some one would move that the majority of the members of the Council are in favour of the admission of women, but would await the views of the annual meeting.

The President said he did not think anybody would move such a resolution as that.

The motion was then put with the following result.

For—Messrs. Churchill, Greenish, Hampson, Hanbury, Owen, Savage, and Shaw.

Against—Messrs. Atherton, Atkins, Betty, Bottle, Cracknell, Hills, Rimmington, Robbins, and Sandford.

The resolution was therefore lost.

The President and Mr. Gostling did not vote.

Mr. Bottle then moved—

"That the question of admitting ladies to all the privileges of the Pharmaceutical Society (membership or associateship), be referred to the next annual meeting of the Society."

Mr. Atherton seconded the motion.

Mr. Gostling said he would willingly withdraw his proposed motion in favour of this.

Mr. Churchill suggested the following:—

"That this Council regrets that it does not feel able to elect ladies as members of the Society until the matter has been again referred to the annual meeting."

Mr. Betty said if that were carried he should move that the next number of the Journal be printed with a black border.

Mr. Bottle's motion was then put and carried unanimously.

Reports of Committees.

Finance.

The report and recommendations of this Committee were received and adopted, and various accounts were ordered to be paid.

Benevolent Fund.

Two meetings of this Committee had been held during the month. The following grants were recommended.

£20 to the widow of a chemist, an unsuccessful candidate at the late election of annuitants.

£10 to another of the unsuccessful candidates, a widow, whose husband had received three grants of £20, £10, and £10, respectively, during the last eighteen months.

£20 to a member, aged 67, who has been unfortunate in business, and suffers from ill health.

£10 to a registered chemist and druggist, formerly in business for fifteen years.

£52 10*s.* to be placed in the hands of the Secretary, the whole or part to be used at his discretion in securing the election of an orphan child.

£26 5*s.* towards securing the election of the orphan son of a late member to the St. Anne's school.

£5 to the widow of a pharmaceutical chemist who died insane.

£10 to a registered chemist and druggist formerly in business, now suffering from acute disease.

The Committee had also discussed certain alterations in the regulations of the Fund proposed by Mr. Bottle, but no decision was arrived at.

The Committee reported that it had received letters of thanks from each of the newly elected annuitants.

Mr. Atkins desired to express to the Council the gratitude of two of the recently elected annuitants as requested by some of their relatives.

The President said he hoped Mr. Owen would assist the Secretary in the matter of the orphan elections.

Mr. Owen said he would do what he could, but it was a very hard work to be attending to more than one election at one time.

Mr. Shaw suggested that any subscriptions coming in after the election of annuitants should be carried forward to next year so as to give the donor a vote.

The Secretary said there were few or no subscriptions received after the election in each year, and he would remind Mr. Shaw that the election next year, if any, would take place in December.

The report and recommendations were received and adopted.

AMENDED REGULATIONS.

Mr. BOTTLE then moved certain alterations in the regulations of the Benevolent Fund of which he had given notice, but which he said he had somewhat modified in consequence of the discussion that had taken place in the Committee on the previous evening. He would take the two proposals separately, and would first move that:—

Rule 4, as approved and confirmed by the Council, March 7, 1877, to be changed to Rule 3.

Approved Rule 3 to be changed to Rule 4, and also to be altered as follows:—

"The following shall be the scale of pensions:—

£30 per annum to pensioners under 65 years of age;

£35 per annum to pensioners of 65 years of age and upwards.

No pension shall exceed £35 per annum."

He said he brought forward the increase in the annuities partly because he felt that the Council was pledged to it, some of the President's remarks at the dinner having committed them, not only to provide for orphans and to increase the number of annuitants, but also to increase the amount of annuities. Another reason was that £30 at the present time did not represent what it did ten or twenty years ago, and with the increased cost of living additional income was required. It was within his own knowledge that as men advanced in life they required additional means, not for food or clothing, but for attendance. He had at first proposed going still further, but he found the Committee was reluctant to limit the number of annuitants to the extent necessary if his original idea were adopted, and he had therefore limited the charge to an increase of £5 per annum on the annuitant attaining the age of 65. This would only involve an additional expenditure of about £65 per annum.

Mr. HILLS said he had much pleasure in seconding the motion.

The PRESIDENT said the question really was whether the amount given to each annuitant should be increased, or an addition made to the number of annuitants. He should like to see the annuities increased even to £40, but the number of recipients would then of necessity be restricted.

Mr. OWEN said the Society was now doing a great deal more for orphans than it had ever done before, and the question was whether it could also increase the amount expended in annuities.

The PRESIDENT thought there would be no difficulty. It was much better to spend the money in this way than to fund £500 or £600 at 3 per cent., or to give it away in casual relief.

The VICE-PRESIDENT said the question was one of degree, whether it was more desirable to add two more to the number of annuitants on the fund, or spend the same money in the way Mr. Bottle proposed. No doubt the cost of everything had increased, that £35 was not more than an equivalent for £30 some time ago. He therefore saw no objection to the motion.

Mr. HAMPSON would have been better pleased if the Committee had sent this recommendation to the Council and he was rather undecided how to vote. The Committee was in a much better position to judge of the conditions of the fund and the demands made upon it than he could be, and he would therefore suggest that the subject be referred back to the Committee. The proposal would probably receive the sanction of the Committee, but if it came back with that sanction it would be better.

Mr. ATKINS said he understood the Committee had considered the question.

The PRESIDENT said that was so, but it had not come to any decision.

Mr. ATKINS said he understood that Mr. Bottle had amended his proposals in deference to the opinions of the Committee. He should probably vote for the motion, the great argument in favour of which was that last mentioned by that gentleman, that the aged required more attendance. There was no doubt that as persons got into advanced life they required very often skilled and careful nursing, which was very expensive.

Mr. GREENISH would prefer the question being sent back to the Committee. He could not help expressing his opinion as opposed to Mr. Bottle last evening, when he found the amount required annually would be from £130 to £150, which would enable them to put five more annuitants on the list. Mr. Bottle's present views were certainly modified, but he still opposed them and should be much better satisfied to see two further annuitants elected rather than the amount increased.

The PRESIDENT hoped the next Council would see its way to increasing the number of annuitants to thirty, and that the fund would be properly supported by the members at large.

Mr. RIMMINGTON thought there was no fear of the means being too limited to give the increase proposed, also to add two more annuitants, because the subscriptions were increasing.

Mr. ROBBINS supported Mr. Bottle in his very moderate demands. He had for some time given this matter his attention and had intended to include it in his own amendments proposed some time ago, but that he thought it better not to mix up different things. Of course if the money were spent in one way it could not be spent in another, but he thought it would be much better to increase the amount of a certain number of the annuities rather than to multiply the annuities. The number mentioned by the President would cost £900 a year, and he thought it would be well to spend another £100 in the way Mr. Bottle proposed.

Mr. BETTY said Mr. Bottle was perfectly right in saying that, in modifying his resolution, he was virtually expressing the views of the majority of the Benevolent Fund Committee. He thought the present suggestion was a compromise which met the exigencies of the case very effectually. This matter had been referred to by the Chairman at the Benevolent Fund dinner, when the suggestion was very warmly received, and he saw no necessity for referring it back to the Committee.

Mr. BOTTLE said he should be the last man to propose anything that had not been thoroughly discussed by the Committee, but he had modified his proposal to meet the views of the Committee, and the object of agreeing to it at once was that otherwise there would be delay in getting the amended regulations printed.

Mr. HAMPSON moved an amendment—

"That Mr. Bottle's resolution be referred back to the Benevolent Fund Committee for consideration and report."

Mr. GREENISH seconded the amendment.

On a division the amendment was lost, only two members voting for it, and the original motion was put and carried.

Mr. BOTTLE then moved—

"That the clause in the regulations of the Benevolent Fund, empowering the Council to *provide* a home for orphan children should be amended so as to enable the Council to *assist in providing* a home for orphans."

Mr. HILLS seconded the motion. He said that he found that the Council had bought stock to the amount of £1700 from the dinner fund, and £300 from the ordinary receipts. This produced £60 per annum, which would almost cover the extra outlay occasioned by the preceding motion.

The motion was agreed to.

Proxies at Benevolent Fund Elections.

The PRESIDENT read a letter from a gentleman at Shanghai to Mr. Hanbury, requesting him to act as his proxy at elections of Annuitants. This raised the important question of proxy voting, on which Mr. Hanbury intended to have moved a resolution but had had to leave.

Mr. HILLS then moved that the following be added to the regulations:—

"That any person entitled to vote but residing abroad may exercise the privilege of voting by proxy, provided that the person authorized is also entitled to vote on his own behalf, and that his name and address have previously been given to the Secretary."

Mr. CRACKNELL seconded the motion.

Mr. SANDFORD thought it would be extremely unreasonable to object to receive a proxy from any one who was prevented by any reason from signing his own voting paper.

Mr. SHAW and Mr. ATKINS supported the proposal. The latter saw no reason for confining the privilege to those resident abroad.

The PRESIDENT said he could see no objection to this proposal. If it was found necessary it could be enlarged or modified next year.

The motion was then carried unanimously.

Regulations of the Benevolent Fund.

The amended regulations of the Fund which will come into operation on January 1st, of next year, are as follows:—

1. To provide pensions for distressed persons who are or who may have been members or associates of the Society; for pharmaceutical chemists; for chemists and druggists; or for the widows of such persons.

To afford occasional grants of money to distressed persons who are or who may have been members or associates of the Society; or pharmaceutical chemists; or chemists and druggists; or their widows or orphan children.

2. At the meeting of the Council in October, in every year, the expediency (financially) of electing pensioners in the following December shall be considered, and in the event of an election being determined on, the decision of the Council, stating the number of annuitants to be elected, and the date on which the election shall take place, shall be made known by advertisement in the *Pharmaceutical Journal and Transactions*, and such other papers as the Council may direct.

3. Every candidate for election must be at least fifty years of age.

4. The following shall be the scale of pensions:—

£30 per annum to pensioners under 65 years of age.

£35 per annum to pensioners 65 years of age and upwards.

No pension shall exceed £35 per annum.

5. Every petitioner for relief from the fund shall produce a certificate of moral character, and such evidence of his or her age as shall be satisfactory to the Council of the Society; and shall also state the time and place or places in which he or she has been engaged in business, whether on the petitioner's own account or otherwise; how his or her misfortunes originated, and when; the present means of subsistence; the number of persons (if any) dependent upon him or her for support; and any other particulars the Council may require.

6. Every widow who is an applicant for relief shall produce evidence of her age, the *certificate of her marriage*, and the *certificate of the burial of her husband*, or such evidence as shall satisfy the Council on these points; she shall also state the period during which her husband was in business, and where; the cause of misfortune, and the present means of subsistence; the number of children (if any) dependent on her for support; and any other particulars the Council may require.

7. Every application on behalf of an orphan shall state his or her age and afford satisfactory evidence of the marriage of the parents, and burial of the deceased parent or parents; and if any and what provision exists for the maintenance of such orphan; the application to be accompanied by a certificate signed as required by clauses 8 and 9, and any other particulars the Council may require.

In the case of an orphan left under circumstances of urgent distress, the Council may, if it thinks fit, provide, or assist in providing, a home by purchase in one of the public asylums for orphans.

8. In all petitions for assistance from the fund, except those specified in clauses 7 and 9 the truth of the statements therein contained shall be certified by at least four members of the Society, or donors to the fund of five guineas, or persons who have subscribed not less than half-a-guinea per year for the three preceding years, and who are personally acquainted with the facts of the case.

9. In the case of a widow or orphan applying for relief and unable to obtain the required evidence under rule 8, the Council will receive and consider in lieu of such evidence the testimony of four respectable householders, to whom the circumstances of the applicant are known, provided that the persons so certifying are respectively subscribers or donors to the fund of not less than half-a-guinea for the current year.

10. All applications for relief or assistance shall be submitted to a Committee of the Council, to be called the Benevolent Fund Committee, previous to being laid before the Council.

The Council, after due investigation, if satisfied that the case is an eligible one, will decide on the amount and character of the relief to be afforded.

When the Council shall decide that any case is fitting for annual pension, the case shall be recorded in a book, to be kept for that purpose, and immediately after the decision as to the expediency of electing pensioners (but not previously), notice shall be given to the persons whose names are so recorded.

11. Should any subscriber or donor, or the widow of any subscriber or donor, become a candidate for an annuity, such number of votes shall be placed to his or her credit, at the first succeeding election, as shall be represented by the whole amount of subscriptions or donations to the Benevolent Fund he or she (or in the case of a widow, her husband) may have contributed.

12. The votes recorded for any unsuccessful candidate shall be carried to his or her credit at succeeding elections.

13. Pensions will be withheld or terminated by the Council if at any time it shall be evident that the election of any annuitant has been secured by fraud or by false representation; or in case of any misconduct on the part of the recipient; or in the event of his or her forestalling by assignment future payments; or if the improved circumstances of the pensioner at any time shall appear to the Council to disqualify him or her to receive the benefits of this fund. Pensions to widows will cease if they marry again.

14. At each election of annuitants contributors to the fund shall have *one vote* for each half-crown subscribed annually, but the number of votes shall be increased to *five votes* for half-guinea, and in the same proportion for each half-guinea subscribed beyond that sum.

15. Persons contributing five guineas at one time shall have *five votes for life* at each election of annuitants, the right of voting at such elections being increased in the proportion of *one vote* for every guinea contributed.

16. Firms or corporations contributing five guineas at one time shall have *five votes* at each election of annuitants for the period of *ten years* from the date of such contribution, the right of voting at such elections being increased in the proportion of *one vote* for every guinea contributed.

17. Persons or firms giving donations of *less* than five guineas, shall have *five votes* for every half-guinea subscribed at the ensuing election of annuitants.

18. One executor paying a legacy of fifty pounds shall have *five votes for life* at each election of annuitants, and if the legacy amount to one hundred pounds, or upwards, each of the executors shall have the same privilege.

19. Persons subscribing on or before the day of election, will be entitled to vote thereat.

20. Every member of the Society and every associate of the Society in business on his own account, not in the receipt of nor an applicant for relief from the fund, shall have two votes at each election of annuitants, and every associate not in business on his own account, who is not in the receipt of nor an applicant for relief from the fund shall have one vote at each election of annuitants.

21. Every person entitled to vote in more than one class of voters shall be entitled to the votes due to him from each of such sources.

22. The votes shall be taken by the voting papers, which shall be sent prior to the election to every member, associate, donor, and subscriber entitled to votes under clauses 14, 15, 16, 17, 18, 19, 20, and 21.

23. Any person entitled to vote, but residing abroad, may exercise the privilege of voting by proxy, provided that the person authorized is also entitled to vote on his own behalf, and that his name and address have previously been given to the Secretary.

24. The voting papers of members, associates, and subscribers whose payments are in arrear shall be withheld until the subscriptions be paid.

25. At every meeting for the election of annuitants, the chair shall be taken by the President, or Vice-President, or by a member of the Council for the time being, and five or more scrutineers shall be elected from the voters present to examine the voting papers, and report to the chairman the number of votes polled for the respective candidates.

26. Should any voting paper not be properly filled up or signed, the same shall be rejected by the scrutineers.

27. In the event of an equality of votes, the chairman shall have the casting vote.

28. The voting papers and scrutineers' lists shall not be open to the inspection of any person without permission from the Council.

29. Should a second scrutiny be demanded or any complaint made in reference to the result of the poll, the same shall be submitted to the consideration of the Council at its first subsequent meeting, and its decision shall be final.

Form of Bequest to the Benevolent Fund.

"*I give and bequeath the sum of* *unto the* PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, *the same to be paid out of my pure personal estate, and to be applied for the purposes of the* BENEVOLENT FUND *of the said Society.*"

N.B.—Devises of land and bequests of money savouring of realty, or in other words connected in any way with land, will be void.

LIBRARY, MUSEUM AND LABORATORY.

The Librarian's report showed that from July to October, the highest attendance, both during the day and in the evening, was 21. The circulation of books had been, in London, 204; country (to 40 places), 70. A list of books missing from the library was presented, which was directed to be advertized. They are as follows:—

Bentley's 'Manual of Botany,' 3rd ed., 1873.
'British Pharmacopœia,' 1867.
Hoblyn's 'Dictionary of Medical Terms,' 7th ed. 1855.
Mohr and Redwood's 'Practical Pharmacy,' 1849.
Pharmaceutical Journal, vol. vi., 1846-7.

The following books were recommended for purchase:—

General Fund.

Wood and Bache's 'United States Dispensatory,' 14th ed.
De Crespigny's 'New London Flora.'
Miller's 'Chemical Physics,' 6th edition.
Squire's 'Companion to the Pharmacopœia,' 11th ed.
Schlickum's 'Die wissenschaftliche Ausbildung des Apothekerlehrlings.'
Falck's 'Uebersicht der Speciellen Drogenkunde.'

Hanbury Fund.

Hanbury and Flückiger's 'Histoire des Drogues d'Origine Végétale, traduit par De Lanessan.'
Pritzel's 'Thesaurus Literaturæ Botanicæ,' ed. nova.

The Librarian had also presented a report on the conference of librarians recently held in London, and it was resolved that the librarian be authorized to become a member of the "Library Association of the United Kingdom," then initiated, and that the annual subscription of half a guinea be paid by the Society. Also that the Library Journal, containing the proceedings of the Association, be subscribed for.

The Curator's report showed that the average attendance in the Museum had been, in the day, 15; evening, 3, in July. For August and September the totals only were given. He also reported that the index to the catalogue was in the printer's hands, and that the specimens of Indian and other drugs were ready for placing in the museum. Duplicate specimens having accumulated in the museum, it was resolved that a list of such specimens be sent to the North British Branch for selection, and a list of the remainder published in the Journal, so that provincial associations might have an opportunity of applying for the same.

It had also been resolved that a list of additions to the museum be published annually, in the same way, and at the same time as the additions to the library.

Professor ATTFIELD had reported that the laboratory had opened favourably, an unusual number of ten months' pupils having entered.

The other professors attended the Committee, but stated that they were not yet able to give information as to the probable number of students in their classes.

All the professors expressed their willingness to deliver lectures at the evening meetings during the ensuing session.

The PRESIDENT drew attention to what he believed was a common misapprehension as to the value of the Bell Scholarship. It was stated to be of the value of £30 annually, but when to this, which is the money value, was added the value of the laboratory instruction and lectures which were given free, and the present of books from Mr. Hills to each scholar, the value was over £66.

Mr. SHAW suggested that a note to this effect should be inserted in the calendar.

Mr. GREENISH did not see how any misconception could arise. No one reading the Journal could possibly misunderstand the value of the Bell Scholarship. He also wished to remark, in reference to the report of the Committee, on the growing expenditure for the carriage of books into the country, which was very satisfactory, as showing that the country members appreciated the value of the library.

The report and recommendations of the Committee were received and adopted.

THE BOARD OF EXAMINERS.

A resolution was passed that as the Board of Examiners for the ensuing year must be appointed at the next meeting of the Council it is desirable that any member of Council who is desirous of nominating any pharmaceutical chemist as an examiner should send the name of any such person to the Secretary before the 22nd instant. That the Secretary be instructed to communicate with any persons whose names may be suggested as suitable persons for examiners, asking if they will accept office if elected.

HOUSE.

The report of this Committee was received and adopted.

LAW AND PARLIAMENTARY.

The report of this Committee included a report from the Solicitor on cases which had been entrusted to him. In one case the offending party had remitted the amount of penalty, with five shillings toward costs. Several cases of alleged infringement were considered by the Committee. A report had been submitted by the Sub-Committee appointed in February last, to consider if any amendments were desirable in the Pharmacy Act, 1868, which it was decided to present to the Council without adoption. The Committee also recommended that the addition of chloral hydrate and its preparations to part 2 of schedule A of poisons, be submitted to the Privy Council for approval, but that no other poisons be added to the schedule at present.

On the motion for the adoption of the report,

Mr. BETTY moved as an amendment that the report of the Sub-Committee above referred to should be adopted and not merely received.

An animated discussion ensued on this point, the result of which was that the report of the Committee was received and adopted, and it was agreed to adjourn the discussion of the Sub-Committee's suggestions until next month, an abstract of those suggestions to be sent to each member of the Council in the meanwhile.

A formal resolution was also passed, declaring that chloral hydrate and its preparations be deemed poisons within the meaning of the Pharmacy Act, 1868, to be placed in part 2 of schedule A.

REPORT OF EXAMINATIONS.

October, 1877.

ENGLAND AND WALES.

	Candidates.		
	Examined.	Passed.	Failed.
Major, 17th	6	5	1
„ 18th	6	5	1
	—12	—10	— 2
Minor, 17th	20	10	10
„ 18th	21	7	14
„ 19th	27	15	12
	—68	—32	—36
Modified	3	2	1
	83	44	39

SCOTLAND.

	Examined.	Passed.	Failed.
Major	1	1	0
Minor, 17th	11	9	2
„ 18th	10	9	1
	—21	—18	— 3
Modified	3	2	1
	25	21	4

PRELIMINARY EXAMINATION.

Candidates.		
Examined.	Passed.	Failed.
232	108	124

Six certificates were received in lieu of the Society's examinations :—

1 College of Preceptors.
1 Faculty of Physicians and Surgeons of Glasgow.
2 University of Cambridge.
1 University of London.
1 University of Oxford.

PHARMACEUTICAL MEETING.

Wednesday, November 7, 1877.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

The minutes of the previous meeting were read and confirmed.

The following donations to the library and museum were announced, and the thanks of the Society were awarded to the donors :—

To the Library.—'Catalogue of Scientific Papers,' vol. vii., from the Royal Society of London ; 'Calendar of the Royal College of Surgeons of England,' 1877, from the College ; Flückiger and Hanbury's 'Pharmaeographia,' and Hanbury's 'Science Papers,' from Thomas Hanbury, Esq., through the British Pharmaceutical Conference ; Walcott's 'Natural History,' 1795, from Mr. J. F. Savory ; MS. Receipt Book, and MS. 'Descriptions and Medical Properties of Plants, with Impressions of their Leaves in Oil,' from Mr. P. L. Simmonds ; 'Inaugural Address delivered at the London School of Medicine for Women,' by Mrs. Garrett Anderson.

To the Museum.—Specimens of fine and coarse powder of the root of *Rheum officinale*; Fine specimen of Crystallized Salicin, from Messrs. Morson and Son ; Specimen of Indian Senna from Madras, consisting of the leaves, etc., of *Cassia obovata*, from Dr. Forbes Watson ; Specimen of Curacoa Aloes and Mafura Seed, from Monsieur C. Chantre ; Specimen of the Pods of *Balsamocarpon brevifolium*, from Thomas Christy and Co. ; Specimens of Boomah Nuts, Loomoonderfall, the seeds of *Cassia Tora*, leaves of *Barosma ericifolia*, and the fruits of *Calophyllum inophyllum*, from the Curator.

The Indian drugs and other donations announced last month were also placed on the table.

Mr. HOLMES said, with regard to the large number of Indian drugs presented by Professor Dymock, in illustration of papers in the *Pharmaceutical Journal*, and which were placed on the table, that each bottle had a label giving a full account of the contents, but one or two of them deserved special notice.

One of these was a kind of aconite root which seemed entirely new ; it had an odour like that of horseradish, was very bitter, but possessed no acridity. There was also a specimen of the ayapana, a plant which grew both in the East and the West Indies, and had been grown for many years in the Mauritius. Concerning the introduction of the plant to the Mauritius, an interesting account was given in the Bouton's 'Plantes Médicinales de Maurice,' which with the permission of the Chairman he would read.

"Captain A. Baudin, brother of the captain who commanded the expedition round the world, brought this plant to the Mauritius in 1797. When at Rio Janeiro, hearing the ayapana spoken of as a panacea, he made all possible efforts to procure slips, but could not succeed, even though he offered its weight in silver. He resolved therefore to carry off surreptitiously during the night a plant which he had seen on a balcony in the town. This was easily effected by a sailor armed with a long pole, and the ship setting sail immediately after, Captain Baudin made off with his treasure. He had hardly arrived in the Mauritius, where the wonderful virtues of this plant had already been published, when each invalid thought himself already cured, and eagerly sought for some of the drug, addressing themselves to the Director of the State Gardens, M. Céré, to whom the cultivation was entrusted. Those who were fortunate enough to grow the plant were soon able to dispose of the leaves at the rate of three sous each in the market. This reputation was maintained for some time, but then a reaction set in, as is usual in such cases, and went from one extreme to another ; and when the plant had been sent to Paris and analysed, many tried to prove that it had no energy whatever. 'Its odour is aromatic,' said one, 'but to a moderate degree ; the same with its bitterness. There is a little astringency, but all its properties are so feeble that it is difficult to believe that it can produce any effect on the animal economy.' Nevertheless, the ayapana continued to enjoy a certain reputation amongst medicinal plants. Every one knows the great use made of it in the outbreaks of cholera in 1855 and 1856, even by prescription of physicians. It is also in every day use in the form of an infusion in cases of difficult digestion, derangement of the stomach, etc. The crushed and macerated leaves mixed with honey and wine also form a valuable application for wounds, contusions, etc., both in the human subject and animals, particularly horses."

There were also specimens of chaulmoogra oil, a plate and description of which plant were given in the present number of Bentley and Trimen's 'Medicinal Plants.' These samples were particularly valuable, because they were prepared by the donor, who is in business as a chemist in the Mauritius, and were therefore known to be pure. M. Loumeau, who sent them, said, in a letter which accompanied the specimens, that the oil imported from India was the only kind which gave satisfaction in the Mauritius for leprosy; these specimens were prepared in his own laboratory, and he should like to know from his old tutor, Professor Attfield, how to detect adulteration in the oil imported from Calcutta, no test being given for it in the Pharmacopœia, in which it was not official.

Another donation he would call attention to was a specimen of Turkey rhubarb grown in England. He doubted himself whether it was the source of East India and Turkey rhubarb, but it was supposed to be so in part by Professor Flückiger and other authorities. The two specimens in coarse and fine powder were equal in colour to the East Indian, but had a slightly different odour. Lastly, he would draw attention to a fine specimen of salicin from Mr. Morson.

The PRESIDENT said there was a time when salicin all came from Germany, but, owing to the great demand, manufacturers in this country were now making it extensively. He desired to call special attention to the value of the collection of Indian drugs sent by Professor Dymock.

Professor BENTLEY also bore strong testimony to the value of the Indian collection. He was at present working, in conjunction with Dr. Trimen, on medicinal plants, and could therefore appreciate the value of such collections. A museum such as theirs should not only represent the materia medica of the present day but to some extent that of the future, and it was only by getting a good collection of specimens from different countries that they could hope to attain this result. He trusted that before long they would have in separate collections in the museum, at all events, the materia medica of the Indian Pharmacopœia and that of the United States. Nothing could be more interesting than such separate groups, and he was sure their energetic Curator would agree with him in this opinion. He perhaps spoke somewhat selfishly, as he was engaged on a work dealing not only with the materia medica of the British Pharmacopœia, but also with that of India and the United States, but still his labours he hoped would be of benefit to others, and it was very important that there should be opportunities of studying specimens of the drugs referred to. The chaulmoogra oil, of which specimens were now on the table, was well known in India, where it was much used for leprosy and scrofula, but up to the present time it had been extremely impure. The seeds were also used both externally and internally, in various cutaneous and other diseases. The specimens, however, now shown did not at all resemble those he had seen from India, which were fluid and of a colour resembling sherry in appearance. He might call the attention of Professor Attfield, if he took up this subject, to a valuable paper by Dr. Dymock, which had appeared in the Journal, wherein he mentioned sulphuric acid as being a good test of its purity. Pure oil would turn, first a burnt sienna colour and then olive-green under the action of sulphuric acid, whilst other oils gave very different reactions. Another plant figured in 'Medicinal Plants,' was *Eupatorium perfoliatum*, which was also in the museum. It was official in the United States Pharmacopœia, and in his opinion, was a medicine well worth a trial in this country. It was much valued in influenza, being called popularly "bone-set," in relation to the effects which a severe attack of influenza often produced.

Professor ATTFIELD felt sure that the confidence which M. Loumeau seemed to feel in the Society and its officials would not be misplaced, and then whatever could be done in the laboratories or other departments towards placing the pharmacopœia of India on a sound footing would be tried; and he hoped this would have a good effect on the materia medica of the future also.

The Chairman then called upon Professor Redwood to read a paper on—

THE POISONOUS PROPERTIES OF YEW LEAVES.

The paper is printed on p. 361, and gave rise to the following discussion.

The PRESIDENT in moving a vote of thanks to Professor Redwood, drew attention to two specimens of yew on the table, one Irish, the other the common variety.

Professor REDWOOD said there were also specimens of the chopped leaves taken from the stomach of the deceased, and also of the digested leaves which had passed into the intestine.

The PRESIDENT said it appeared pretty evident that the mere infusion was practically inert, and as plants of this order generally yielded oleoresins, or bodies of that class, a mere infusion could not be expected to be active. It was well known that the Irish yew was exceedingly dangerous to animals, but it was also consistent with what they knew before, that this woman had to take the plant itself before any ill effect arose, the mischievous quality being probably contained in some oleoresinous body which was not soluble in water. Thus euphorbium was known to be very active although perfectly insoluble in water, but soluble in alkalies and alcohols. The taxine, he observed, was called an amorphous alkaloid.

Professor REDWOOD said it had been called an alkaloid, but he was not prepared to say it was a true alkaloid.

The PRESIDENT said it would probably turn out to be one of those resinous acids which were known to be very active as medicinal agents, such as scammonin and jalapin. He trusted the question would be further investigated, as it was very important. He should like to know if the ordinary yew had the same power, as he had not found that it was poisonous.

Professor ATTFIELD believed there was at least one well recorded instance in which a large quantity of the decoction had proved to have a fatally poisonous effect. He also knew from his own experience that the berries were poisonous when swallowed whole, although it remained to be proved whether the poisonous principle was contained in the fleshy part of the fruit or in the seed, or in both. Some years ago a case of poisoning from eating yew berries occurred in the neighbourhood in which he was then residing, near Finchley, some fifty or sixty being found in the stomach or intestines of the child after death. There were very many instances in which the eating of the leaves had produced strongly marked poisonous effects. It had been stated by Lucas and Maviné that the yew leaves and the fruit contained a poisonous alkaloidal crystalline principle termed taxine, very slightly soluble in water, but freely soluble in dilute acids and in chloroform, petroleum, and spirituous liquids generally. If these observations were correct it would follow that a large quantity of the decoction would have to be taken to produce poisonous effects. They also stated, if he recollected rightly, that taxine was to be found in the fruit, but in a much smaller quantity than in the leaves. It would follow that if the leaves got into the stomach the taxine would be attacked by the acid it there met with, and would be thus absorbed by the system.

Professor BENTLEY said this was an interesting subject, and one upon which a great variety of opinion had been expressed. He had known of undoubted cases of poisoning from yew leaves, and he was glad that Professor Redwood had taken up the subject, because a great many erroneous notions had prevailed upon it. Some said the yew leaves contained a poisonous principle, whilst others denied it altogether, and said their action was simply mechanical. In 'Medicinal Plants' his colleague, Dr. Trimen, and himself had gone into the subject, summing up, as far as they could, the information already obtained. The question was very interesting, not only to pharmacists, but more especially to veterinary surgeons, for there could be no doubt that where animals browsed upon the yew, whether in the green state or lying on the ground dry, it had acted distinctly as a poison. He had no doubt either that the seed was poisonous, but at the same time he was convinced that the fleshy covering around it was was perfectly innocuous. As a boy he had eaten this over and over again, and he did not think Lucas found any poisonous principle in the pulpy parts; in fact he did not remember that he had analysed the fruits, although they had been analysed, and the analysis went to show that the external covering was innocuous though the seeds were poisonous, containing a bitter resinous principle which he had no doubt was the bitter principle found by Lucas in the leaves. It was not, however, described in the older analysis he referred to, as an alkaloid, but as a resinous principle, and he had so described it about a year and a half ago. Since then a paper had been published in the *Journal of the Chemical Society*, by Mavin é, on 'Taxine,' in which he gave a readymethod of obtaining it, and distinctly called it an alkaloid. He was not chemist enough to say whether it was alkaloidal or resinous, but it was evident the subject required further investigation. He believed Maviné was the first who discovered taxine in the seeds though he found it in larger quantity in the leaves. Physiological experiments on the action of this body were also much needed. Dr. Pereira had mentioned the medical action of yew, and there was no question it was a powerful substance, and if it possessed the sedative effect of digitalis which had been ascribed to it, without the cumulative quality which rendered that so dangerous, it would be a most valuable agent.

Professor ATTFIELD said Maviné's paper was published in the early part of the present year, and it stated that the fruit, not distinguishing between the pulp and the seeds, contained less taxine than the leaves. It remained to be ascertained whether the pulp or the seed contained the taxine, which Maviné, if not Lucas, distinctly stated was crystalline and alkaloidal.

Mr. GREENISH remarked that in an old work of great repute on the Continent, 'Kosteletzky's Flora,' it was distinctly stated, that the poisonous property of yew was resident in the leaves, the fruit being used for making a syrup which was given as a sedative in chest complaints. It also stated that the seeds were bitter and poisonous. Peretti found in the leaves a volatile oil, and a bitter principle. According to Lucas the active principle is a white amorphous bitter powder, to which he gave the name "Taxin." In 1859 this matter had been examined by Schroff, who stated that the leaves were exceedingly poisonous, and that they possessed an acrid property and a narcotic property, one of which was soluble in alcohol and ether, and the other in water.

Mr. GERRARD said he had been engaged during the last few weeks in making pharmaceutical preparations of yew, for the use of Dr. Ringer who intended to investigate the subject physiologically. He had exhausted about fourteen pounds of the dry leaves of the common yew with alcohol and then with water, and endeavoured to separate the extracts into their various constituents. He had obtained a body which as far as its external appearance went seemed to be an alkaloid, but chemically it did not appear to be so, it possessed more of the property of a glucoside. This was dissolved out by chloroform, and the mother liquor was then treated with ether. The chloroform residue, although precipitated by phosphomolybdate of soda and nitric acid was not precipitated satisfactorily by any other alkaloidal reagents. It reduced alkaline cupric tartrate, was slightly soluble in water, and did not form, as far as he could tell, salts with acids. If, however, he took ten grains of this residue, and added one drop of dilute nitric acid with water, he obtained at once an acid solution. This he thought was pretty good proof that it was not an alkaloid. He did not say that benzol or bisulphide of carbon might not extract an alkaloid, but he thought it doubtful.

Mr. NAYLOR remarked that while the fruit of the Irish yew could not be eaten with impunity by horses, it could be by those animals which did not crush their food. For instance, pigs had been known to eat these berries to a considerable extent. This would tend to show that the active principle did not reside in the fleshy portion, but in the seed. He had known animals killed by eating the common yew also.

Mr. PRINCEP said he had known the berries of the common yew eaten with impunity, but he could not say whether the seeds were swallowed.

Mr. POSTANS said the subject was a very interesting one. A belief very commonly prevailed that the young shoots might be eaten without harm. It was therefore important that the question should be cleared up.

Mr. G. S. TAYLOR said he had eaten large quantities of the fruit as a boy and had seen others do the same, but never knew any ill effect to follow, but they never chewed the seeds. He should like to ask Professor Redwood whether it was a decoction or an infusion of the yew which was used in the case he had referred to. It was possible that the active principle might be extracted by continued boiling when it would not by ordinary infusion.

Professor REDWOOD said he had employed the term "yew tea," because that was used by Dr. Alfred Taylor, who spoke of its being used as a popular therapeutic agent amongst a certain class of persons he named. The preparation taken by the woman referred to was a decoction which had been boiled for some length of time. It was stated that a large handful had been put into two quarts of water; he found three and a half pints of decoction left, and obtained about three ounces of leaves and twigs after they had been dried, so that he calculated that about six ounces had been employed. It was not, however, until the leaves were swallowed that the poisonous effects were produced.

Professor ATTFIELD asked what was the quantity of leaves taken.

Professor REDWOOD said he had stated that already. There was no evidence to show that anything was thrown off the stomach, though there had been retching; but everything was carefully preserved, and there was no attempt at concealment of any kind. Both the man and his wife were much respected, and he felt that every reliance could be placed on the statements made. He estimated that about twenty grains of the leaves were found in the stomach mixed with about three ounces of half-digested food; but in the duodenum there was a hard compact mass of the leaves which weighed about half an ounce.

Mr. LONG remarked that in the playground of the school he attended in Oxfordshire there were several yew trees, and the boys constantly ate the fruit. Whether they always spat out the seeds he could not say, but he never knew any bad results follow.

Mr. HOLMES briefly described the differences between the common English and the Irish yew, the former being abundant on chalky soils throughout Kent and Surrey. It was the English probably which generally acted as a poison in this country, the former having branches spreading more or less horizontally, and the leaves equally distributed, while the Irish variety had erect branches with leaves more or less tufted, whence its name "fastigiata." The Irish yew was not unfrequently to be seen in gardens and shrubberies, might be easily recognized by its peculiar cypress-like habit. The English yew was common in hedges or chalky soils in Kent and Surrey and occasionally on limestone; in other counties the Irish variety. He knew children frequently ate the berries without harm, and a short time ago he noticed a quantity of the seeds lying under a yew tree, which he imagined had been thrown away by the birds after having eaten the pulp. With reference to the cumulative action of digitalis mentioned by Professor Bentley, he had recently seen it stated in a medical journal that this was due to defective action of the kidneys, which in health would eliminate the poison. With regard to the taxine which Mr. Gerrard spoke of, as far as he could gather, two substances seemed to be obtained, one an amorphous powder and the other a crystalline. It occurred to him that the amorphous powder might be the natural salt and the crystalline one the alkaloid obtained from it. Had Mr. Gerrard tried the action of test paper on taxine?

Mr. GERRARD said he had, but with no result.

The PRESIDENT said he did not believe any harm would arise even if the seeds were swallowed, provided they were not crushed. He would remind the audience that the alkaloids acted mainly on the nervous system, but it was evident that the poison of the yew, which had been fatal in this and many other cases, was of a local character producing local inflammation, which was just the character of the irritant oleoresinous bodies, and he apprehended this would turn out to be the nature of the poisonous principle in this case.

The next paper read was—

SOME FURTHER REMARKS ON SWEET SPIRIT OF NITRE.

BY F. M. RIMMINGTON.

Mr. RIMMINGTON stated that his first paper which appeared in last week's Journal had been intended to be read at the meeting of the Society, but by mistake had first appeared in the Journal. He, however, wished to read the following paper as a supplement to the other:—

The paper is printed at p. 362, and gave rise to the following discussion:—

The PRESIDENT asked Mr. Rimmington how he arrived at the percentages of the ether.

Mr. RIMMINGTON said he took a four ounce flask fitted with a bent tube, and adapted it to a small Liebig's condenser. About 250 grains of fused calcium chloride were introduced into the flask, together with spirit. Distillation was then commenced, and the distillate collected in a 1000 grain flask. The quantity distilled varied according to the quality of the spirit. If it were a strong spirit, such as that of the 1747 Pharmacopœia, it would be necessary to draw over 300 gr. before it all came over, but if it were a weak spirit, such as that usually sold, it would be only necessary to draw over 60 or 70 grains. He used the decem measure, which was easily converted into cubic centimetres if required. It was in fact a fractional distillation. It might be a question whether he got all the ether over, but this was proved by the fact that if distillation was carried further clean spirit was obtained, and sulphate of iron gave no indication of nitrous ether with what was left in the retort. There might be a small loss, but it was very small. He reckoned if he got 4 per cent. of nitrous ether from 100 grains of the pharmaceutical spirit he had lost 1, which would make 5. His results differed considerably from the statements of others as to what different spirits contained or should contain. For instance, Professor Attfield stated 10 per cent., but he had not found anything of the sort. He had found as small a quantity as three or four per cent. of ether.

Professor ATTFIELD wished to ask Mr. Rimmington how he knew that the distillate obtained on heating sweet spirits of nitre in a retort was wholly nitrite of ethyl. He could quite understand that when he tested the residue in the retort, and found no nitrite of ethyl there, he came to the conclusion that it had all passed over, but he did not understand how he satisfied himself that what had passed over was wholly nitrite of ethyl. It had been stated by some experimenters that when the chloride of calcium test was applied to sweet spirit of nitre, if 2 per cent of ethereal liquid was obtained it might be considered that 10 per cent. of that same ethereal liquid, whatever it might be, was present in the sweet spirit of nitre, but he feared that no one knew what the ethereal liquid contained. The statement in his 'Manual,' referred to by Mr. Rimmington, was not taken from his own researches, but was merely given as the statement of others, and he himself had yet to learn what that ethereal fluid was. Experimenting in the way that the author of the paper had stated, and using the term nitrite of ethyl for the liquid which he obtained by his process, he took it Mr. Rimmington wished it to be understood that sweet spirit of nitre was and ought to be a solution of nitrite of ethyl. But he must confess after making scores of experiments with large quantities, both before and after the dilution with spirit of wine, he himself had no conception what sweet spirit of nitre was formerly, what it was now, or what it ought to be in the future. He was casting no slur on the compilers or the able editor of the Pharmacopœia in saying this, because he found it there stated that it was a spirituous solution "containing nitrous ether." This was quite true. Reading further he found it now stated in the paragraph headed "Characters and Tests," that this so-called spirit of nitrous ether, when agitated in a closed tube with chloride of calcium, yielded 2 per cent. of its original volume not of nitrite of ethyl, but of "an ethereal liquid." It seemed from these words that the editor of the Pharmacopœia knew as well as he did that this ethereal liquid was not wholly and solely nitrite of ethyl. What grounds had Mr. Rimmington for regarding his distillates as nitrite of ethyl?

Professor REDWOOD said he felt that Mr. Rimmington had attempted rather too distinctly to define what the ethereal substance contained in sweet spirit of nitre was, and that they had gone as far as it was safe to go in the description given in the Pharmacopœia. He recollected when he brought forward and explained the process which was now adopted in the Pharmacopœia that a gentleman present came up to him afterwards and said he thought it was a very nice process, but there was one defect in his account of it, namely, that he had not clearly explained the nature of the decomposition and reaction that took place, and the composition of the product which was obtained. He was fain to plead guilty to that imputation, and his answer was that he should be very glad to give the explanation if he had possessed the knowledge, but being in ignorance on both those points all he could say was that a sweet spirit of nitre so produced was a product which could be obtained with ease and certainty, for he always made it at his lectures, and the process went on by itself, which was not the case with any of the previously described processes. It always gave a definite result, though what it was had hitherto eluded their investigation. It contained nitrite of ethyl, aldehyd, and probably other compounds, but in what proportion it was extremely difficult to indicate. All they could say was that it always contained the same proportion of the same ingredients. Some said that sweet spirit of nitre was of no medicinal value, but to that he could not agree. It was one of his favourite remedies, and he believed it to be a most valuable therapeutic agent. They knew, moreover, that one at least of the other nitrites, the nitrite of amyl was a very valuable and powerful therapeutic agent, and whatever the efficacy of sweet spirit of nitre, their knowledge must depend upon experimental observation. It was established in the public favour, the public would continue to ask for it, and medical men would continue to prescribe it. It was the duty of the Pharmacopœia, therefore, to supply a process which would enable the manufacturer to produce it in a definite condition.

The PRESIDENT thought Mr. Rimmington's critics had been somewhat unfair to him in their remarks. It was not necessary that he should clearly explain what the oily liquid which floated on the chloride of calcium was. In the Pharmacopœia they were given to understand, at least by inference, that it was looked upon as nitrite of ethyl, and he did not think Mr. Rimington was to blame for assuming that it was so. The real point of his observations was that he took a portion of sweet spirit of nitre, distilled a certain part of it and from that fraction he got a result which, by a slight calculation, gave him the composition of the original liquid This was the really important point which he had brought forward.

Mr. Rimmington wished to ask Professor Attfield what the stuff was if it was not nitrite of ethyl? He knew that Dr. Pereira said such a decomposition took place, but he had not analysed this product to see whether it was true nitrite of ethyl or not. He assumed, as others had done, that it was perhaps not perfectly pure, but tolerably so. He did not believe that aldehyd was separable by chloride of calcium.

Professor Attfield said the only answer he could give to the question was to state again, that he did not know what the product was, but he knew it was not pure nitrite of ethyl although it contained that substance. Mr. Rimmington's distillate probably contained a large quantity of alcohol and, he must add, aldehyd, etc. He, the speaker, and his assistants, had operated on many ounces, he might say pounds of the ethereal fluid separated from spirit of nitrous ether by chloride of calcium, but he did not yet know what the liquid was. It had been assumed to be wholly nitrite of ethyl, but there was no evidence whatever in support of that statement. He was in a position to say that it contained a large proportion of aldehyd, some alcohol and certainly less than half its bulk of nitrite of ethyl; but no one could yet state its exact composition.

The next paper read was entitled—

Notes on Casual Drugs.

BY E. M. HOLMES.

The paper is printed on page 362.

The President drew attention to a small bottle of oil which he had obtained from the seeds of the calophyllum, the process being exhaustion by benzol. He had operated on the kernels of 30 seeds weighing altogether 6 ozs., from which about ½ oz. of oil was obtained.

The Chairman then announced that the next evening meeting would be held on Wednesday, December 5th.

Provincial Transactions.

CHEMISTS AND DRUGGISTS' ASSOCIATION.

Report of Committee Meetings.

A meeting of the Finance Committee of the Association was held at the office, 23, Burlington Chambers, New Street, Birmingham, on November 2, 1877, at 10·30 a.m.

Mr. Thomas Barclay, Vice-President, in the chair.

The Secretary reported that the Association had a balance at its bankers of £869 13*s.* 5*d.*, and that there were about 3450 members on the Register.

A meeting of the Law Committee was held at the office, on November 5, 1877, at 1 p.m. Mr. S. U. Jones, President, in the chair.

The brief of arguments for the appeal in the case of the Apothecaries' Company *v.* Shepperley, drafted by the Solicitor after consultation with counsel, was read and approved. The Solicitor said he had retained three counsel to undertake the argument in the appeal, namely —Sir Henry James, Q.C., Mr. Buszard, Q.C., and Mr. Clement Higgins.

The Solicitor then explained the steps that had been taken in the case of the Apothecaries' Company *v.* Wiggins.

The Secretary reported having received that day a communication from a member residing at Bradford in Yorkshire, stating that proceedings had been commenced against him by the Apothecaries' Company for alleged infringements of the Apothecaries Act, 1815, and that he was summoned to appear at the Bradford County Court, on the 13th inst. The Committee instructed the Secretary to make full inquiries respecting this case.

The Secretary said that in compliance with a resolution passed at the last meeting of the Law Committee, he had taken proceedings under the 17th section of the Pharmacy Act against three unregistered vendors of poisons, and that in each case the offenders were fined by the magistrates.

The case of a firm of chemists, members of the Association, who had been summoned for selling soda water and cayenne pepper said to be adulterated, was then fully discussed, when it was moved by Mr. Jervis, seconded by Mr. Barclay, and unanimously resolved:—"That the Solicitor be instructed to defend members in the summonses taken out against them under the Adulteration Act, 1875, for the sale of soda water and cayenne pepper."

The Secretary said it would be within the recollection of the Committee that a scheme for organization, prepared by him, was submitted to the general meeting of the trade in connection with the Association, held at Glasgow, on September 8, 1876, when a resolution was passed adopting the scheme, subject to such modification as the executive may deem desirable. The portion of the scheme relating to Scotland had been amended by the Scotch Committee, and confirmed by the Executive Committee at its meeting on February 28th last. The remainder of the scheme was submitted to the Executive Committee at its meeting on May 25th last, when a resolution was passed leaving its consideration in the hands of the Law Committee. The scheme for England and Wales, as amended by the Secretary, was then laid before the Committee and approved.

The most suitable time for holding the first election of the General Committee, and the best means of conducting the same was debated, when it was moved by Mr. Southall, seconded by Mr. Jervis, and unanimously resolved:— "That the Secretary be instructed to issue a printed copy of the scheme for organization to each member of the Association, with a circular and voting form, requesting him to nominate and vote for a member of the General Committee (or so many as may be allotted to the district in which he resides), as explained by the scheme; the circulars, etc., to be forwarded to the members not later than the 10th of December next, with instructions that the voting forms must be filled up and returned to the Secretary not later than the 31st of December next.

The Secretary was empowered to engage the services of Messrs. Laundy, Harrison, Harris, and Caldicott, the official auditors of the Association, to superintend the elections, and declare the results of the same.

It was moved by Mr. Holdsworth, seconded by Mr. Barclay, and unanimously resolved:—"That a report of the appeal in the Apothecaries' Company *v.* Shepperley be printed and circulated to all chemists and druggists named on Kelly's 'Chemists' Directory.'"

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, November 1st, Dr. Gladstone, President, in the chair. The minutes of the previous meeting were read and confirmed. The list of presents to the Library was read, and the thanks of the Society given to the respective donors. The following certificates were read for the first time: W. J. Williams, W. D. Harland, A. H. Elliott, H. R. Hind, H. B. Mason.

The following papers were communicated to the Society:—

1. "*a.*" "On some Hydrocarbons obtained from the Homologues of Cinnamic acid," and "*b*" "On Anethol and its Homologues," by W. H. Perkin, F.R.S. "*a.*" Considerable quantities of cinnenylacrylic crotonic angelic and phenylcrotonic and angelic acids were prepared. The

hydrocarbons were at first obtained by decomposing the acids by heat, afterwards the process proposed by F. Binder, viz., treating the hydrobromo acids with bases, was found to yield more satisfactory results. A solution of hydrobromic acid in glacial acetic acid, instead of an aqueous solution answered very well. The following acids were prepared and examined—hydrobromocinnenylacrylic acid, $C_{12}H_{15}BrO_2$, fuses 85° to 87° C.; hydrobromocinnenylcrotonic acid, $C_{13}H_{17}BrO_2$, crystallizes in flat oblique prisms, fuses at 148–150° C., on further heating HBr is evolved; hydrobromocinnenylangelic acid, $C_{14}H_{19}BrO_2$. All these hydrobromo acids when treated with a cold solution of sodium carbonate or potassium hydrate decompose, hydrocarbons being produced as follows:—Isopropylvinylbenzene boils at 203–206° C., sp. gr. at 15° ·8902. Heated for a few hours to 150° C. it solidifies to a transparent glassy mass. This change also takes place slowly at ordinary temperatures in daylight. The properties and chemical reactions of this substance are given. The dibromide was prepared, fusing at 71°. Isopropylallylbenzene, boils at 229° to 230°, sp. gr. at 15° ·890, does not solidify at 15° C.; its formation may be represented thus:—

$$C_6H_4\ (C_3H_7)\ CH{=}CH.\ OH_2\ COOH =$$
Cinnenylcrotonic acid
$$C_6H_4\ (C_3H_7)\ CH{=}CHCH_3 + CO_2$$
Isopropylallylbenzene
$$\text{or } C_6H_4\ (C_3H_7).\ CH_2\ CHBr.\ CH_2\ COOH =$$
Hydrobromocinnenylcrotonic acid
$$C\ H_4\ (C_3H_7)\ CH{=}CHCH_3 + HBr + CO_2.$$

Its dibromide was obtained by shaking the hydrocarbon with bromine. It melts at 59° to a colourless oil, crystallizing beautifully on cooling. Isopropylbutenylbenzene is a colourless oil, boiling at 242–243°, its sp. gr. at 15° is ·8875. It resinifies if kept in contact with air. Its dibromide was prepared, melting at 77°. Allylbenzene boils at 174–175°, sp. gr. at 15° ·9180; when heated between 160°–200° for sixty hours it did not undergo any visible change; its dibromide was obtained as a crystalline mass, fusing at 67°; butenylbenzene, a colourless oil boiling at 186–187° C.; a dibromide was prepared crystallizing in needles melting at 67°. The two last named hydrocarbons have already been obtained: allylbenzene by L. Rügheimer (*Journ. Chem. Soc.*, 1874, p. 894); it has the same constitution as the body prepared by the author. The butenylbenzene; however, prepared by B. Aronheim (*Deut. Chem. Ges. Ber.*, v., 1068), is isomeric with the one now produced. "*b.*" On gently boiling methylparoxyphenylacrylic acid, an oil gradually distils over, having a fennel-like odour. This body, after purification, had the formula $C_9H_{10}O$; the author proposes to call it vinylic-anethol; it boils about 201 to 202°, melts at about 1 to 2°. Its formation may be represented thus $C_6H_4\ (OCH_3).\ CH \underline{\quad} CH\ COOH = C_6H_4(OCH_3).CH \underline{\quad} CH_2 + CO_2$.

An endeavour was made to prepare this substance by Binder's reaction, but without success. On heating methylparoxyphenylcrotonic acid an oil distils over, carbonic acid being evolved; by fractional distillation, freezing, and pressing the mass thus obtained between blotting paper, perfectly pure allylic, or ordinary anethol, was obtained, identical with that obtained from oil of anise. By heating methylparoxyphenylangelic acid butenylic anethol is obtained in an impure state, but by treating the hydrobromo derivative of that acid with sodium carbonate, etc., perfectly pure butenylic anethol is obtained. It is crystalline, fusing at 17° C., boiling at 242–245°; sp. gr. at 30° ·9733; formula, $C_{11}H_{14}O$. In conclusion, the author discusses the formation of the hydrocarbons from the hydrobromo acids by heating with sodium carbonate; he finds that silver nitrate in aqueous solution, sodium acetate, and, in some cases, even water, may be substituted for sodium carbonate, and yet the hydrocarbon be formed, and concludes that the hydrocarbons are formed simply by the separation of hydrobromic acid and carbonic anhydride. The author remarks that only the hydrocarbon and anethol containing vinyl polimerize when heated, and form compounds corresponding to metacinnamene; also their boiling points differ much more from those of the compounds containing allyl than do the latter from those of the butenyl compounds.

Dr. Gladstone said that the Society had rarely listened to a research so productive of new and interesting substances, and pointed out the interesting results which would probably be obtained by an examination of the refraction and dispersion of these new bodies.

The thanks of the Society were then given to the author for the above paper.

Dr. Armstrong then read a paper by M. M. P. Muir, "On Two New Methods for Estimating Bismuth Volumetrically." Chancel has shown ('Jahrber,' 1860, 612) that bismuth is precipitated in the form of phosphate by the addition of a soluble phosphate to a solution of the metal in nitric acid. Both processes are based on this fact. In the first bismuth is thrown down from nitric acid solution, after partial neutralization with ammonia, by addition of a standard solution of sodium phosphate; the final point of the reaction is determined by spotting the supernatant liquid on a slab with warm ammonium-molybdate solution. The results are approximately accurate. In the second process the nitric acid solution of bismuth is mixed with an excess of sodium acetate, a measured volume—excess—of standardized sodium phosphate is added, the liquid boiled and filtered, the precipitate is well washed with hot water, and the excess of phosphoric acid determined in the filtrate by titration with a standard solution of uranium acetate. The results are very accurate. This second method is much to be preferred to the first, and is much more satisfactory than the author's dichromate process (*Chem. Soc. Journ.* i., 1876, 483).

The next paper was also read by Dr. Armstrong "On the Oxidation of Ditolyl," by T. Carnelly, D.Sc. Last year in the production of tolylphenyl the author obtained a quantity of liquid and solid ditolyl as a bye-product, by fractionating solid ditolyl, melting at 121° C.; and two liquid ditolyls boiling about 275 and 285° were obtained. These substances were oxidized with chromic and glacial acetic acids; solid ditolyl gave on oxidation, first, diparatolylphenylcarbonic acid—

$C_{12}H_{18} \begin{cases} CH_3 \\ COOH \end{cases}$ as a white powder melting with blackening at 244°; and secondly, diparadiphenyldicarbonic acid $C_{12}H_{18} \begin{cases} CO{\cdot}OH \\ CO{\cdot}OH \end{cases}$

The two liquid ditolyls gave identical results on oxidation, first, ortho-para-tolyl-phenyl-carbonic acid.

$C_{12}H_{18} \begin{cases} CH_3 \\ COOH \end{cases}$ a white powder melting at 170° C.; and, secondly, orthopara-diphenyl-carbonic acid—

$C_{12}H_{18} \begin{cases} COOH \\ COOH \end{cases}$ a white powder which sublimes before fusing, and finally terephthallic acid. The above experiments show that when sodium acts on a mixture of para and orthobromtoluene, two isomeric ditolyls are produced, the dipara and the orthopara compounds. The author gives graphic formulæ showing the constitution and relations of the above bodies, and concludes by stating that he hopes to be able to prepare the diorthoditolyl from it, obtain by oxidation diphenic acid, and thus confirm the constitution of phenanthrene.

The last paper was entitled, "Note on a New Manganese Reaction," by J. B. Hannay. When a solution of a manganous salt in strong nitric acid is warmed with the addition of crystals of potassic chlorate, the whole of the manganese is precipitated as manganous manganate. If a salt of iron be present a double manganate of iron and manganese, $2\,Fe_2(MnO_4)_3$, MnO, MnO_3, $12\,H_2O$ is precipitated, no other metals seem to be precipitated with manganese under the same conditions. The precipitate is insoluble in nitric and sulphuric acids and unattacked by caustic alkalies. Hydrochloric acid acts on it and reducing agents rapidly decompose it. Sulphurous acid first attacks the iron, setting free manganese dioxide, which rapidly collects into little nodules, having a considerable degree of coherence. The manganese slowly disappears, the final reaction being—

$$Fe_2(MnO_4)_3 + 6 \cdot SO_2 = Fe_2(SO_4)_3 + 3\ MnSO_4.$$

The principal interest in the above reaction is that it furnishes a good method of separating iron from aluminium, etc., without the use of pure caustic soda. The iron compound appears under the microscope as thin flexible plates of a purple-brown colour.

Mr. Groves remarked that nothing was said by the author as to the effect of the presence of phosphoric acid on the reaction.

After the thanks of the Fellows had been given to the authors of the above papers the Society was adjourned to November 15, when the following papers will be read:—

1. "On Gallium," by Professor Odling.
2. "First Report to the Chemical Society on some points in Chemical Dynamics," by Dr. Wright and Mr. Luff.
3. "On the Influence exerted by Time and Mass in Certain Reactions in which Insoluble Salts are Produced," by M. M. Pattison Muir.
4. "On two New Fatty Acids of the series $CnH_{2n}O_2$," by C. T. Kingzett.

Parliamentary and Law Proceedings.

Death from a Narcotic.

On Monday, Oct. 22, an adjourned inquest was held at Weymouth, on the body of Mr. Frank Cole, commercial traveller, who was found dead in his bed. Since the adjournment the stomach, lungs, etc., of the deceased had been in the hands of Mr. Stoddart, analyst, of Bristol, it being the opinion of Dr. Lush that deceased had died from some poison. The day after the inquest, the chemist who sold the draught which the deceased had taken before lying down for the night, made a statement to the Coroner as to what the draught contained, consequently the Coroner decided that the analyst should not proceed with his examination.

The adjourned inquest was held at the Guildhall, and the proceedings lasted several hours, all the medical gentlemen of the town and neighbourhood being present, besides a large number of the inhabitants.

Dr. Moorhead and Dr. Henry Tizard both stated that they had together made a *post-mortem* examination of the body of the deceased, and that they had found the heart in such a state of fat as likely to cause death any day; had heard from Mr. Gregory that he had given a sleeping draught containing a narcotic. They had both known Mr. Gregory for several years, and believed him to be a careful chemist. Dr. Moorhead said he had never known Mr. Gregory to make a mistake.

The inquiry lasted until a quarter after nine o'clock, and very considerable interest was manifested as to the result.

The Coroner very carefully summed up the evidence, alluding particularly to the statements of the medical gentlemen, who were of different opinions, three being of opinion that the deceased died from natural causes, and two that the poison in the draught hastened his death.

The jury retired, and after a short absence, returned with the verdict:—That the deceased died by misadventure: that the draught given by the chemist hastened his death; but that at the time he took the draught he was in a very dangerous state of health." It was the opinion of some of the jurymen that the draught stopped the action of the heart, the deceased being in a sickly state when he took it.—*Western Morning News.*

Prosecution under the Sale of Food and Drugs Act.

At the Pontypridd Petty Sessions, held at the Court House, Pontypridd, on the 31st of October, Mr. John Davies, chemist and druggist, was summoned for two offences under the above Act.

The superintendent of police stated that he went to the shop of Mr. Davies and asked him to supply him with half a drachm of sulphate of quinine and half an ounce of calomel. After the goods were supplied the superintendent informed the vendor that the drugs had been purchased for the purpose of analysis, and that he intended to send one third of the quantity to the county analyst. He also offered to leave one-third part with Mr. Davies. Mr. Davies declined, on the ground that he had enough of the same sort. He wished to put his own label on the samples and did so, putting "quinine" on one packet and "calomel" on the other, delivered both samples to Mr. Scott, the county analyst, and now produced two certificates. The calomel was certified by Mr. Scott to contain traces of bichloride of mercury, and the quinine to contain slightly more than 21 per cent. of cinchonine.

Mr. Davies, on being sworn, said: I am a chemist at Pontypridd. I recollect Mr. Matthews purchasing some quinine of me. I gave it to him out of a bottle, the one produced. I bought it of Howard and Sons, Stratford, London. It is labelled "Sulphate of quinine, prepared by Howard and Sons (late Howard and Kent), Stratford, London." I sold it in precisely the same state as I received it. I never had any cinchonine in my possession. I never mixed anything with the quinine I received from Howard and Sons. The calomel was also sold by me exactly in the same state as I received it in the bottle produced. He (Mr. Davies) stated that, with reference to the calomel, he sold it as he bought it. The perchloride of mercury would be about the same price, and sixteen times the strength, so that there would be no advantage or profit in mixing or adulterating it. He had, however, not sold all the contents of the bottle from which the perchloride had been taken. He had forwarded samples to Professor Attfield, London, and Mr. Thomas, the borough analyst, Cardiff, and both certified that the samples were pure.

The Bench believed that Mr. Davies had not had cinchonine in his possession, so that he could not have mixed it with the quinine; and, further, they were of opinion that a respectable tradesman like Mr. Davies would not be likely to jeopardize his position and prospects by committing the offence with which he was charged. They, therefore, dismissed the case.

Correspondence.

"*Opium.*"—Nothing of importance is left in the marc.

W. N. G. L.—We think the fault must be in the manipulation.

W. P.—Nitric acid is supplied in which nitrous acid would be present as an impurity.

D. Dickinson.—Jenkins'. 'Electricity and Magnetism,' published by Longmans, price 3*s.* 6*d.*

A. F.—Parchment paper made from good sound unsized paper may be used. A parchment paper specially prepared for dialysing purposes is, we are informed, made by Messrs. Rube and Co., Weende, near Gottingen.

J. A.—Numerous recipes for cements, have already appeared in the present series of this Journal, and may be found by referring to the index. A solution of 1 part of aluminium in 10 parts of water, mixed with 80 parts of strong mucilage of gum arabic has been recently recommended.

Communications, Letters, etc., have been received from Dr. Morel, Professor Dymock, Mr. Bateman, Mr. Pooley, Mr. Ackerman, Mr. Stevens, Mr. Thresh, Mr. Laurie, Mr. Cardwell, Mr. Mackay, Mr. Bassett, W. T. T., F. H. B., H. R. M., J. B., A. H., G. H., M. P. S., W. F. F., Tom, Subscriber, Nemo, Omega.

ABNORMAL WATERS.

BY A. J. COWNLEY, F.C.S.

Whilst the condition of the London potable waters, as regards their freedom from impurity, has been very rigidly and ably controlled by the periodical issue of their analyses by the Rivers Commission, there seems to have been no attempt made at any official supervision of a class of waters of not less sanitary importance. I allude to the waters that are used by the public in certain of the metropolitan swimming baths. This investigation was made after having obtained the result of the analysis of the water No. 2, which had been used by an adult subject, who subsequently exhibited symptoms ascribable to the condition of this water.

Samples of the waters were taken from the baths by a competent person, on days at the latter end of the week during the month of August, when the temperature of the air ranged between 68° and 70° Fahrenheit. The earlier publication of this paper has been delayed by unavoidable circumstances.

For the sake of convenience in expressing the results of analysis I have used the terms ammonia α and ammonia β to express the ammonia yielded by sodic carbonate and that yielded by alkaline potassic permanganate respectively.

Water No. 1. This water was inodorous but turbid.

	Parts per 100,000.		Grains per gallon.
Ammonia α	·078	equal to	·054
Ammonia β	·019	„	·0133
Chlorine	1·60	„	1·12
Total Solid Contents	27·50	„	19·25

No. 2. The sample of water was decidedly offensive in smell and was turbid.

	Parts per 100,000.		Grains per gallon.
Ammonia α	·054	equal to	·037
Ammonia β	·030	„	·021
Chlorine	25·72	„	18·00
Total Solid Contents	93·00	„	65·10

No. 3. Inodorous but turbid.

	Parts per 100,000.		Grains per gallon.
Ammonia α	·04	equal to	·028
Ammonia β	·03	„	·021
Chlorine	1·40	„	·98
Total Solid Contents	30·00	„	21·00

No. 4. Very clear and inodorous.

	Parts per 100,000		Grains per gallon.
Ammonia α	·026	equal to	·018
Ammonia β	·027	„	·019
Chlorine	1·23	„	·86
Total Solid Contents	30 00	„	21·00

No. 5. Inodorous and free from turbidity: contained moving organisms.

	Parts per 100,0C0.		Grains per gallon.
Ammonia α	·014	equal to	·0098
Ammonia β	·029	„	·02
Chlorine	12·12	„	8·48
Total Solid Contents	97·00	„	67·90

No. 6. Inodorous: slightly turbid.

	Parts per 100,000.		Grains per gallon.
Ammonia α	·015	equal to	·0105
Ammonia β	·011	„	·0077
Chlorine	3·71	„	2·59
Total Solid Contents	25·00	„	17·50

No. 7. Clear, colourless and inodorous.

	Parts per 100,009.		Grains per gallon.
Ammonia α	·014	equal to	·0098
Ammonia β	·018	„	·0126
Chlorine	1·48	„	1·03
Total Solid Contents	27·00	„	18·90

General Remarks.—In every case the solid residue remaining on evaporation blackened more or less considerably when ignited gently. The large quantity of chlorine in No. 2 and No. 5 points to an impure source of supply. The lesser degree of impurity shown by No. 7 is due to some sort of supervision which is exercised by the parochial authorities.

An opinion may be formed of the condition of the waters under examination from the following analysis of a sample of Thames water collected near the Temple; it was filtered through filter paper before being analysed :—

	Parts per 100,000		Grains per gallon.
Ammonia α	·04	equal to	·028.
Ammonia β	·028	„	·019.

On the supposition that we are justified in demanding that these waters should be equal in purity to a potable water, and should not then contain more than ·002 part ammonia α, and ·007 part ammonia β per 100,000 parts of the water, the proportional amount of impurity in these waters is expressible by the formulæ $\frac{\alpha}{\cdot 002}$ and $\frac{\beta}{\cdot 007}$.

	$\frac{\alpha}{\cdot 002}$	$\frac{\beta}{\cdot 007}$
Potable Water	1·0	1·0
Water No. 1	39·0	2·7
„ „ 2	27·0	4·2
„ „ 3	20·0	4·2
„ „ 4	13·0	3·9
„ „ 5	7·0	4·1
„ „ 6	7·5	1·6
„ „ 7	7·0	2·6
Thames Water (filtered)	20·0	4·0

Whilst recognizing the necessity of not fixing too high a standard of purity for waters of this class, yet these results, showing three and nearly four of them to be more highly polluted than Thames water which had been freed from suspended matter, are so excessively abnormal, when compared with a potable water, that no other conclusion is warranted but that these waters are too impure to be allowed to be used for the purposes to which they are applied. It is to be remarked, further, that as the subsequent experiments prove that by the human pollution of a water the resulting ammonia β is greater than ammonia α, whereas in these waters the contrary is the rule, they must have been exposed in a polluted condition to atmospheric action for a time sufficient to have passed through this change. This deduction of course only holds good for the primarily pure waters and not for those whose source is polluted.

To express these results in a more concrete form would be to ascertain the number of units which represents the human pollution these waters have undergone. The following experiments are to that end.

A water was examined before and after pollution by a human subject who had allowed twelve hours to elapse since a previous matutinal bath.

I.—3·5 gallons taken.

	Ammonia α Grains per gall.	Ammonia β Grains per gall.
After	·0084	·0938
Before	·0014	·0049
Pollution added per gall.	·007	·0889

Total pollution = ·007 × 3·5 = ·0245 grains α
and ·0889 × 3·5 = ·311 grains β.

II.—Twenty-four hours had elapsed since the subject of experiment had passed through experiment I.: there is very nearly a proportional increase in the products obtained. 3·5 gallons of water taken.

	Ammonia α Grains per gall.	Ammonia β Grains per gall.
After	·0161	·1442
Before	·0014	·0049
Pollution added per gall.	·0147	·1393

Total pollution = ·0147 × 3·5 = ·051 grains α
and ·1393 × 3·5 = ·487 grains β.

Under these conditions, therefore, human pollution was eliminated which is expressed by—

·051 grains ammonia α
·487 " " β

III.—This experiment is merely noticed as showing the possibility of obtaining pollution in a more concentrated form.

In this case the same volume of water (viz.: 3·5 gallons) was used twice within a period extending over eighty-four hours, and subsequently to the subject having passed through expt. II.

	Ammonia α Grains per gall.	Ammonia β Grains per gall.
After	·1260	Not ascertained.
Before	·0056	
Pollution per gall.	·1204	

or = ·12 × 3·5 = ·42 grains ammonia α.

It is to be noticed here that the increase in the amount of ammonia α is not in proportion to the increase of II. over I.; partly to be explained by the decomposition which had taken place during the period the water had been exposed to the air as in the case of the waters, No. 1 to No. 7.

As a fair unit to represent the standard of human pollution I have taken twice the sum of ammonia α and ammonia β obtained in expt. II. or $2(\alpha+\beta)$.

Then if x = sum of $\alpha+\beta$ yielded by each water and y = sum of $\alpha+\beta$ yielded by each water when primarily pure;

also if 100,000 gallons be the volume of each water, and they are in most instances above this volume, then

$$\frac{x-y}{2(\alpha+\beta)} \times 100{,}000$$ equals the number of human subjects who eliminating impurity equal to the standard have contributed to its pollution. This number will of course decrease as the amount added by each unit increases; that is to say, the number deducted from the formula $\frac{x-y}{2(\alpha+\beta)}$ × the volume will not represent an absolute number, if the units which have contributed to the pollution of each water be of a higher degree of impurity than the tandard allows for.

On these data the following results are obtained:—

Water No. 1.

Grains per gallon.	Grains per gallon.
·054	·0014
·0133	·0049
x = ·0673	y = ·0063

x − y = (·0673 − ·0063) = ·061 Grains per gallon.

From expt. II., α = ·051
β = ·487

$2(\alpha+\beta)$ = ·538 × 2 = 1·076

then

$$\frac{x-y}{2(\alpha+\beta)} \times 100{,}000 = \frac{.061 \times 100{,}000}{1·076} =$$

nearly 5600 units of pollution

Water No. 2 similarly

$$\frac{·0517}{1·076} \times 100{,}000 = 4800 \text{ nearly.}$$

No. 3.

$$\frac{·0427}{1·076} \times 100{,}000 = 4000 \quad ''$$

No. 4.

$$\frac{·0307}{1·076} \times 100.000 = 2800 \quad ''$$

No. 5.

$$\frac{·0235}{1·076} \times 100{,}000 = 2200 \quad ''$$

No. 6.

$$\frac{·0119}{7·076} \times 100{,}000 = 1100 \quad ''$$

No. 7. The volume of water is taken at 50,000 gallons.

$$\frac{·0161}{1·076} \times 50{,}000 = 750 \text{ nearly.}$$

In the following table the results which I have obtained in this investigation are recapitulated and speak for themselves as to the necessity of requiring that every medical officer of health shall include in his functions the official control of the public swiming baths in his district. Who can say what source of propagating zymotic disease is more easy of development?

Parts per 100,000 parts of the waters.	Ammonia yielded by sodic carbonate.	Ammonia yielded by subsequent treatment with alkaline potassic permanganate.	Chlorine.	Total solid contents.	Proportional amount of impurity taking α in a potable water as being equal to ·002 per 100,000.	Proportional amount of impurity taking β in a potable water as being equal to ·007 per 100,000.	Human pollution per experiment II., et seq.
.	α	β			$\frac{\alpha}{·002}$	$\frac{\beta}{·007}$	
Water No. 1	·078	·019	1·6	27·5	39	2·7	5600
" 2	·054	·030	25·72	93·0	27	4·2	4800
" 3	.040	·030	1·40	30·0	20	4·2	4000
" 4	·026	·027	1·23	30·0	13	3·9	2800
" 5	·014	·029	12·12	97·0	7	4·1	2200
" 6	·015	·011	3·71	25·0	7·5	1·6	1100
" 7	·014	·018	1·48	27·0	7·0	2·6	750
Thames Water.	·04	·028	...	...	20·0	4·0	...
Potable Water.	·002	·007	...	...	...	...	...

THE TINCTORIAL POWER OF SOME PHARMACOPŒIA PREPARATIONS.

BY WILLIAM GILMOUR.

(*Continued from page* 181.)

In following out the inquiry into the relation existing between the tinctorial power and the actual strength of some Pharmacopœia preparations, the interest attached to most opium preparations led me to continue the investigation more immediately in this direction. For this purpose a number of commercial samples were obtained and subjected, in the first instance, to an examination colorimetrically, after which, as in previous experiments, the amount which each yielded of dry extractive was determined. This method of procedure was of course here intended only to give an approximate idea of the relation existing between the colour, power, and strength, and not as in any way expressive of an absolute conclusion. This may follow, but in the meantime it is sufficient, as already indicated, that we call attention, in the first place, to the somewhat important general agreement between the two (colour-power and strength in extractive), and in the next place to the sufficiently important variation which both point out as existing in commercial samples of these preparations.

1st.—Tincture of Opium.

Sampl	Transmitted Light.	Dry Extract.
1	46°	5·2 per cent.
2	48°	4·4 „
3	52°	4· „
4	55°	3·2 „
5	57°	3·8 „
6	58°	3·5 „

It should here be noted (and it shows how an investigation frequently widens in the process) that a considerable variation existed in the spirit strength of some of the tinctures, doubtless accounting to some extent for the variation existing in some cases betwixt the amount of transmitted light and dry extract. At least, there was a much closer relation betwixt the two in the case of the liquid extract, and this we think can only be reasonably accounted for on some such supposition. The various samples in table 2 were all made from commercial extract of opium, and with the exception of sample 1, which was made from a dry and nearly hard extract, the samples were all very much alike in appearance, consistence, etc.

2nd.—Liquid Extract of Opium.

Sample.	Transmitted Light.	Dry Extract.
1	46°	4·3 per cent.
2	50°	3·7 „
3	53°	4·4 „
4	53°	4· „
5	58°	3·6 „
6	59°	4· „

The relation betwixt the two columns was still more marked in the case of Battley's solution of opium. Three different samples of this preparation were examined, and in all a very close approximation in strength, both colorimetrically and in extractive, was obtained.

3rd.—Battley's Liquor Opii.

Sample.	Transmitted Light.	Dry Extract.
1	45°	5·8 per cent.
2	46°	5·4 „
3	47°	5·2 „

Now without unnecessarily dwelling on the difference in strength of the foregoing samples it may simply be pointed out that in the case of tincture of opium presumably made by the ordinary chemist and druggist the extreme variation in the six samples was in the case of transmitted light 12° and of dry extract two per cent., but in the case of the liquid extract of opium made from ordinary extract presumably obtained through some wholesale manufacturer, the variation was in the light transmitted 13° and only ·8 of dry extract. Being anxious to test a sample of tincture made under our personal care with the foregoing results, four pints were "set agoing" as an experiment. Filtered, pressed, made up to measure and estimated the result obtained was,—transmitted light 57° and dry extract 4·4 per cent. as against 53·7° transmitted light and 4·01 per cent. dry extract, the average of the six samples. Of more importance, however, was the fact that the marc after being subjected to the ordinary pressure (and which in its damp state weighed only a little over three ounces) on being again re-digested for twenty-four hours with 5 oz. spirit yielded a tincture which gave 65° transmitted light and three per cent. dry extract. The wisdom of the plan pursued by some manufacturers of first digesting the marc of the old preparation in the spirit of the new previous to adding the fresh opium is thus thoroughly demonstrated and commends itself for more general adoption.

As one practical outcome of these experiments let us now take a preparation of opium, the strength of which cannot readily be estimated by any simple process of analysis, and see how it compares with these results. We have seen that the average of transmitted light in the six samples of tincture was nearly 54°, and this was amply confirmed as a fair average by the tincture specially prepared and examined for the purpose. Now if we take for example liniment of opium, we *à priori* assume that it should transmit much more light than this, from the fact that the tincture of opium in this preparation is diluted in equal proportions with a comparatively colourless tincture. This, however, scarcely squares with the actual facts as shown in the following table:—

4th.—Liniment of Opium.

Sample	1	Transmitted Light	47°
„	2	„ „	54°
„	3	„ „	55°
„	4	„ „	57°
„	5	„ „	66°
„	6	„ „	66°
„	7	„ „	71°

As a matter of fact, whatever the remainder may have been, the first two or three liniments in this table could not possibly have been made according to Pharmacopœia instructions. This was more than confirmed by the decidedly alkaline reaction which some of the liniments gave on being tested; and without entering more immediately into the matter, this probably indicates the method of their preparation as well as accounts for the depth of colour which they exhibit.

NOTES ON INDIAN DRUGS.

BY W. DYMOCK.

(*Continued from page* 162.)

ABUTILON INDICUM.—*Local name*, PETAREE; *the* TUBOCUTY *of Goa.*

The bark of this shrubby plant is used in Goa as a diuretic; it occurs in long, thin, tough, fibrous strips, which are very strong and seem worthy of attention as a fibre. Externally it is striated and covered by a cinnamon-coloured epidermis; internally it is white and striated; the striæ appear to be produced by small interspaces between the fibrous bundles of which the bark is composed. The drug has a feebly astringent taste, and by some is considered to be slightly bitter. The plant is a very common one and appears to flourish in poor soil and require but little water; it is quite distinct from the variety which produces bulbij.

Althæa officinalis.—*Local name of flowers,* Gul Khairo; *root,* Risha i Khitmi; *seeds,* Tukm i Khitmi.

These three articles are imported into Bombay from Persia; the flowers have by some been attributed to *A. rosea,* but the carpels which may be found mixed with them have not the membranaceous margin of those belonging to that plant, and the exterior calyx has from eight to nine divisions instead of six. The greater part of the drug consists of the calyx, which is double, with the half mature petals attached, but some fully developed flowers are to be found, and occasionally a nearly mature fruit. The calyx is thick and covered with simple hairs very closely set, and arranged in star-like tufts; the flower has five petals, which in the dry article are of a bluish-green colour at the base, the blades being purple; both calyx and flowers are mucilaginous. Gul khairo is used in cough mixtures. The root known as khatmi appears to me to be the same as the guimauve of the French, but it is not decorticated, nor is it so plump and free from fibre; it is used for the same purposes as that drug. Tukm i khatmi consists of the carpels, which are dark brown, ear-shaped, about three-tenths of an inch in the longest diameter; their external surface is hairy and furrowed; the flat sides are also studded with white simple hairs, and the margin is plaited. The interior of the carpel is polished and of a grey colour; it contains one dark grey seed, similar in shape to the carpel, with a dull yellow kernel. Tukm i khatmi is mucilaginous.

Malva sylvestris.—*Local name,* Khabazee.

The fruit is a common bazar drug and is imported from Persia. It consists of from ten to twelve glabrous wrinkled carpels, each containing one reniform seed. Some of it is mature, but at least half is in various stages of immaturity. A portion of the thin papery calyx is attached to the fruit. In a good fresh sample a few deep blue flowers may be seen, as well as a number of peduncles of unequal lengths, and occasionally a petiole surmounted by the five-nerved base of the leaf. Although I have not raised the plant from seed I think there can be little doubt that this drug is derived from *M. sylvestris.* Khabazee is mucilaginous.

Viola, Sp. ?—*Local name,* Gul i Banafsha.

The blossoms of a dark blue violet, mixed with a few leaves and fragments of the plant. They have the same appearance as those of the common scented blue violet of Europe.

Viola, Sp. ?—*Local name,* Kishmiri Banafsha.

Consists of small knotted pieces of rhizome, to some of which flowers and leaves are attached; the former appear to have been white originally. I am inclined to think this drug identical with the scented white violet of Europe.

Clerodendron infortunatum.—*Local name,* Kari.

The leaves of this plant are noticed in the 'Pharmacopœia of India,' as a cheap and efficient tonic and antiperiodic. They are also said to be used as a vermifuge. I have not seen them used medicinally in this part of the country, but there is no doubt that they are strongly bitter. The plant may be seen in many of the Bombay gardens, and it grows wild in the Southern Concan. It is an under shrub 3 or 4 feet high. The leaves when fully grown are from 8 to 10 inches long, and from 7 to 8 inches broad at the base, dark green, long petioled, rounded or ovate cordate, edges dentate, hairy on both sides; hairs white, jointed; venation very prominent on the under surface; odour disagreeable, taste bitter. The inflorescence forms large terminal cross-armed panicles, which appear in March; flowers white streaked with pink, sweet-scented; after they have fallen the calyces enlarge and turn red. The plant grows freely and produces a large quantity of leaves.

Papaver Rhœas.—*Local name,* Lala.

This poppy is cultivated in Guzerab as a garden flower, but its petals do not appear to have ever been an article of the Indian Materia Medica. Mr. Law says that the Mahometans of that province believe it to be the Lala of the Persian poets, which is generally translated tulip (*vide* Graham's catalogue of Bombay plants, No. 37). In the Bombay shops the capsules of a poppy, in size and shape just like those of *P. Rhœas,* are sold under the name of Jungli Mudrika. The word mudra means a seal, and mudrika stamped with a seal; under these two names the Hindoos have a metal seal or stamp with which they impress the body after ablution. The impression is made upon the forehead, both temples, both breasts, both shoulders, and the pit of the stomach. The mudra bears various inscriptions peculiar to the sects using it, *e.g.,* followers of Vishnu often engrave upon it Shri Narayen; those of Shiva, Namas Shevaya. The former dip the stamp in a paste made of gopi chandan, a kind of white clay, the latter in a paste made of bhasam (ashes of cow dung). The mudra is also used by Swamis as a branding iron. When these teachers visit a town numbers of their followers flock to them to receive the impression of the hot iron; for this they pay a small fee, and insist upon having a good impression for their money. These poppy capsules somewhat resemble the mudra in shape. As a medicine I should imagine them to be useless.

Polyporus officinalis.—*Local name,* Gharikoon.

This is the white agaric of European medicine, and is imported into Bombay from the Persian gulf. It is commonly kept by native druggists, being an important article in the materia medica of the Mahometans, who prescribe it in a great number of disorders, generally in combination with other drugs. According to their Hakeems it acts principally by expelling cold and bilious humours. A figure and description of this substance will be found in Guibourt's 'History of Drugs,' vol. 2, p. 45. A thin section soaked in glycerine shows under the microscope that the fungus is made up of a branching network of tubular fibres supporting a large quantity of granular and cellular material, amongst which may be seen numerous colourless refractive particles which are probably resinous. White agaric has been analysed by Braconnot, who found in 100 parts 72 of a peculiar white resinous matter, 2 of bitter extractive, and 26 of insoluble fungus.

CONIUM MACULATUM ?—*Local name*, KEERDAMANA.

Under this name a fruit is sold in the shops which resembles English hemlock fruit, with the exception that it is a little larger and of a darker grey colour; sections of both compared under the microscope show a similar structure, viz., that described in the 'Pharmacographia.' Keerdamana when crushed in a mortar and treated with caustic potash has the same offensive smell as the English drug. I suppose the slight difference in colour, and larger size, to be due to climatic influences, our article being probably grown in Persia or Northern India. The occurrence in India of plenty of this seed at a cheap rate enables us to prepare an efficient preparation of hemlock (the extr. conii fructus fluid, U.S.P.) without recourse to Europe.

CINNAMOMUM LOUREIRI ?—*Local name*, KALA NAGKESUR.

Under this name the fruit of a cinnamon is sold. I am informed that it is that of *C. Loureiri*, but I have not seen this tree. Kala (black) nagkesur consists of a small brown mucronate berry, the size of a grain of millet, enclosed in a six-partite calyx half an inch long, and articulated to a slender pedicel; the calyx and pedicel are of the dark brown colour of the clove, and have a strong cinnamon odour and taste. The properties of the drug would appear to be the same as those of cinnamon.

CINNAMOMUM, Sp. ?—*Local name*, DARCHINI.

The darchini, or cinnamon, of Bombay is the Chinese *Cassia lignea* so well known in Europe. Cassia oil obtained from this bark is also largely imported and used as oil of cinnamon. No true cinnamon is obtainable here. The bark of various Indian cinnamons is sold under the name of taj. It is much inferior to the Chinese article, being in short thick pieces and having a coarser flavour.

CORCHORUS TRILOCULARIS.—*Local name*, KARROO CHUNTZ; *Bazar name of seed* RAJA JEERA.

The seeds of this plant are small black and angular, having a diameter of about $\frac{1}{1}$th of an inch. Several seeds may often be seen adhering together, showing how closely they were packed in the trilocular capsule. In all the samples of this drug which I have seen there was a small proportion of the larger seeds of *C. olitorius*. These may easily be distinguished by their shape, which resembles that of a life-buoy. Their length is $\frac{1}{10}$th of an inch. Both seeds are bitter. They are given in fever and bowel complaints, in doses of half a tola (about 80 grains). The plant grows freely in the rainy season, and yields a good fibre.

SISYMBRIUM IRIS.—*Local name*, KHAKSHIR.

Small red oblong seeds, about $\frac{1}{20}$ of an inch long, one surface convex, the other grooved, the grove ending in a notch, interior yellow and oily. They turn rancid if kept for any time. When placed in water they become coated with a transparent mucilage. Khakshir is imported from Persia and is known by various names in different parts of that country. In Fars it is called shafterak, in Khorasan khakshir, in Tabriz soordan, in Turkistan sheewaran, and in Mazenderan shalambee. The Arabs call it khuba. The name placed at the head of this notice is that under which the seed is imported into Bombay; in other parts of India it is better known as khubkalan. Medicinally it is thought to be stimulant and restorative; it is also used externally as a stimulating poultice. A large quantity is imported, as it is in constant demand among the Mahometans.

CERBERA THEVETIA.—*Local name ?*

Common in gardens in Bombay, where it grows very freely, and is usually pollarded a few feet from the ground to make it form a handsome bush, much like an English willow. The fresh bark of the young wood, of from $\frac{1}{2}$—1 inch in diameter, is green, smooth, and covered by a delicate grey epidermis, through which the green colour is apparent. The wood is white and soft, and there is a large central pith. All parts of the plant abound in milky juice, and have an acrid smell when bruised. A section of the bark examined under the microscope shows many large laticiferous vessels arranged in bundles, which form a zone, but is not otherwise remarkable. This plant is the *Thevetia neriifolia* of the Pharmacopœia of India, and is recommended in that work as an antiperiodic; it does not appear to be used medicinally in this neighbourhood. There would be no difficulty in obtaining a good supply of bark, as the trees are frequently cut; if collected from the young wood and dried it forms quills of about the thickness of cinnamon, externally dark grey with brown striæ, internally smooth and black; texture tough, taste bitter, no particular odour.

JUSTICIA GENDARUSSA.—*Local name*, TEO.

The young shoots have a smooth, green, or purple bark; from the joints, which are somewhat tumid, spring secondary shoots. The leaves are opposite, short petioled, lanceolar, obtuse, frequently a little scalloped, smooth; nerve and veins purple, or green according to the variety, from 3—6 inches long, and from $\frac{1}{2}$—1 inch broad. Spikes terminal, erect; flowers dirty white, spotted with purple. The odour of the plant when crushed is ferny, the taste peculiar and not disagreeable; its medicinal properties are noticed in the Pharmacopœia of India. In Bombay it is a well known edging plant for flower beds. When cultivated for this purpose it is stunted and the leaves are seldom more than 3 inches long. I have never known it to be used medicinally.

PISTACIA KHINJUK.—*Local name of Gall*, GUL-I-PISTA.

The galls when old are of a reddish brown colour as stated in the Pharmacopœia of India, but when fresh are bright pink on one side and yellowish white on the other; they vary much in shape and size, some being perfectly fig-shaped, some almost spherical, the majority are ovoid; the apices are pointed or often mucronate; the largest have a diameter of from $\frac{5}{8}$—$\frac{6}{8}$ of an inch; many are no larger than a pea. At the base a portion of leaf often remains attached; here also may be seen an open stoma which communicates with the interior of the sac; the walls are thin, brittle and translucent; the taste acidulous, very astringent, and mildly terebinthinous; the odour terebinthinous. When broken open most of the sacs are seen to contain only a little fecal débris, but in some skeletons of an aphis may be found, consisting of a head, thorax, and abdomen divided into segments, clothed all around with bristles. Gul-i-pista is an astringent medicine; it is also used for tanning leather. The resin of *P. khinjuk* is used in Bombay instead of mastic, to which it is much inferior in perfume.

(*To be continued*).

THE MUTTON WINE OF THE MONGOLIANS, AND ANALOGOUS PREPARATIONS OF THE CHINESE.*

BY DR. D. J. MACGOWAN, OF SHANGHAI.

Chinese medical writers make little distinction between materia medica and materia alimentaria. The *Pun-tsao* ascribes therapeutic properties to all articles that are used as food. Nearly all portions of animals, the human frame included, are supposed to be efficacious in the treatment of disease. In their preparation they are for the most part subjected merely to ordinary culinary treatment. The exceptions consist of animal substances, which are macerated in fermented or distilled liquors. To these they apply the term *chiu*, commonly rendered "wine" by sinologues. Hence we find in the *Pun-tsao*: "Mutton wine, dog wine, deer wine, deer-horn wine, tiger-bone wine, black snake wine, flowery snake wine, *hi* snake wine, and tortoise wine."

Alcohol is designated in the *Pun-tsao* as ah-lih-kih, which indicates the Arabian origin in China of the art of distillation. It is seldom used as a pharmaceutical menstruum, their distilled *chiu* being employed as a solvent for articles used as medicines.

These animalized liquors, if that term be allowable, are for the most part extemporaneously prepared—a few only are to be had in apothecary shops ready made; such are several kind of snake wines. These latter are used in palsy. In Kwang-si the fermenting agent is a species of wild grass. The snake thus employed appears to be peculiar to the mountains of that province. To assure purchasers that the article is genuine, a strip of the skin of the animal is fastened to the top of the containing vessel. This wine is in high esteem as an anthelmintic, and as an antidote to malaria. Wuhu on the Yang-tse produces a snake wine which is in high repute. An adder wine is used in paralysis and insanity. There is a long edible snake spoken of as found in Kiang-si, which, being dried and smoked, is pared off in thin slices, liked smoked beef, and is found a convenient condiment by travellers.

The wine in which tortoise has been macerated is described as useful in chronic bronchitis. Cases of ten and twenty years' standing have, says the *Pun-tsao*, yielded to this remedy.

Dog wine is described as very heating and stimulating.

The officinal *mutton wine* of the Pharmacopœia is in fact made of goat's flesh, the goat and sheep being often confounded; the latter animal does not appear to have been known to the ancient Chinese.

Various species of sheep are described in the *Pun-tsao*, or Chinese Pharmacopœia, which are not recommended for macerating in wine. Among these is the great-tailed sheep of the Kwan-lun mountains, the caudal extremities of which are stated to weigh thirty pounds, rendering locomotion difficult. It is added that these adipose tumours require to be removed annually, else the animal will die. Their tails are cut open, the fat cut out, when the edges are brought together by a suture.

Sheep and goat wines are directed to be prepared in the following manner:—Take ten catties (1 catty = $1\frac{1}{3}$ lb.) of soaked rice, seven catties of goat or sheep flesh, fourteen onions, one Shan-tung cabbage, and a catty of almond kernels. Mix them well together, and let the mixture stand and brew without malt for ten days, at the end of which time a small quantity of liquor is produced; it is a sweet and unctuous liquor, or mutton wine. This is the formula adopted in the preparation of all the animal liquors above named.

"Mutton or goat wine is a great restorer of the constitution; it strengthens the stomach, the kidneys, and testes," according to the *Pun-tsao*.

Having many years ago met with a jar of mutton wine, which its owner, a Mongolian mandarin, greatly prized, I instituted inquiries respecting its mode of preparation and uses among the nomads of the north, but without success until a few months ago, when the Rev. J. Gilmour, in response to a request that I made of him, courteously undertook the investigation of the matter, and was at the pains to have the article prepared under his own supervision.

The following were the ingredients:—one sheep, forty catties of cow's milk wine; one pint of skim milk, soured and curdled; eight ounces of brown sugar; four ounces of honey; four ounces of fruit of dimocarpus (*Euphorbia Litchi*, Desf.); one catty of raisins, and half a dozen other drugs weighing in all about one catty. The sheep must be a castrated male, and two years old, neither more nor less.

Plant necessary for distillation.—One large pot (cast iron), one wooden half-barrel opened at bottom,* one smaller pot (cast iron), one earthenware jar, felt belts, cow-dung, fire.

Process.—Set the boorher on the large pot, calk the joining first with paper, then daub the outside with cow-dung and ashes. Make the boorher air-tight by plastering it all over outside with cow-dung.

Pour in the wine, add half the raisins (*i.e.*, ten ounces), cut or crushed, half the brown sugar, the pint of skim milk, and the bones of the sheep's legs from the knee downward, after breaking them open.

From the other bones strip all the fat and most of the flesh, leaving them fleshy. Hang them, head and all, inside the boorher high enough to be beyond the reach of the wine, and low enough to be out of reach of the pot above. Break up the medicines into small pieces (do not pound them), and put them into the earthenware pot. Into that pot put also the honey, white sugar, dragon's eye, and the remaining half of the brown sugar and raisins; suspend the earthenware pot in the centre of the boorher, put on the pot above, and make the joining air-tight by paper, cloth, and felt bands. Apply fire to the great pot. When the upper pot feels warm to the touch, fill it with cold water and stir it. When the water becomes too hot to touch, ladle it out and fill up with cold water. When this second potful of water becomes too hot for the hand, slacken the fire, take off the upper pot, and the earthenware pot will be seen full of a dirty brown liquor boiling furiously. Take out the earthenware pot, pour off the liquid, replace the earthenware pot, replace the upper pot, fill with cold water. When this potful of water becomes hot the whole thing is over. The earthenware pot is

* From *New Remedies*, for October, 1877. First published in *Journal of the North China Branch of the Royal Asiatic Society*, vol. vii., 1873, p. 235.

* This is about two feet high and tapering. At the bottom it is large enough to sit on the rim of the big pot: at the top it is small enough to let the small pot sit in it without falling through. It is called *Boorher*.

again about half filled, pour it off, and let it cool. When reasonably cold put it up in jars, and close them with the membrane of ox or sheep's bladders.

Remarks.—The great bulk of the flesh of the sheep is not used, nor any of the fat; all the marrow-bones are broken open. The skull is not broken open, nor the tongue extracted from the head. At the end of the process the mutton on the bones is cooked, but tastes badly. The quantity of cow's milk wine in the pot is not much diminished, but the strength is gone, and what remains is good for throwing away only.

Time of making.—"It should not be made before the seventh or eighth Chinese month. This was made on the 12th of the ninth month. It should not be used before the 11th or 12th Chinese month. None but aged people should drink it. It may be taken daily in one, two, or three small Chinese winecupfuls, till finished. The first winter the patient uses it, not more than two or three catties should be drunk. If found to agree with the patient, and if taken a second winter, another catty may be added, *i.e.*, first winter two and a half, second, three and a half, third, four and a half catties. If kept till spring it becomes useless, if not dangerous. Many people use it, but few take it more than one winter. Its use is (seemingly) to repair any manifestations of weakness arising from old age.

"*Case.*—Rev. J. Gilmour's teacher, when fifty years old, was afflicted with a shaking of the head from right to left. He drank two or three catties of mutton wine in the dead of winter, recovered, and is now all right."

The liquor thus prepared has a very strong odour of mutton; it is sweetish and unctuous. Specific gravity, 0·98873. Alcoholic percentage, 9·14.

ADMIXTURE OF STRYCHNIA WITH SANTONIN.

A short time since a statement that the administration of santonin has been occasionally followed by convulsions, and the fact that in one case in this country strychnine crystals were found mixed with santonin, led to some speculation as to how far the convulsions may have been dependent upon a similar admixture. As a contribution to the discussion the following quotation from the *Canadian Pharmaceutical Journal* has considerable interest:—

"Two cases of poisoning by misadventure call for a more particular notice, as showing the necessity of a more careful handling of poisonous drugs on the part of those engaged in their sale. Both resulted from the substitution of strychnine for santonin, and in one case death was only averted by the most prompt and energetic measures. As there is an action at law at present pending in regard to this case, and the details will shortly be made public, we refrain from any extended remarks, and merely give a brief outline of the circumstances. Mr. Lawrason, a druggist of Mitchell, was called upon to furnish a dose or doses of santonin, and for this purpose opened a fresh bottle just received from the wholesale druggists, and from it took directly the quantity required. The patient to whom the medicine was administered soon showed symptoms of poisoning; two medical men were quickly called in, and the stomach pump was at once put into use, fortunately, with the effect of saving the patient's life, for it was afterwards ascertained by analysis that the so-called santonin had been mixed with strychnine. The medical expenses were met by Mr. Lawrason, who in turn falls back on Messrs. Winer and Co., of Hamilton, who furnished the drug, and we understand that a suit for compensation, in which the damages are laid at ten thousand dollars, has been instituted.

"The second case resulted fatally, and is thus stated in the Dundas *True Banner*:—

"'A most unfortunate affair happened in West Flamboro' village, resulting in the death of a child three years and a half old, son of Mr. George Kent, painter, of this place. It appears that the child had been unwell, and Dr. Shaver being called in, prescribed some powders—one to be taken each morning and evening. On Thursday morning one of the powders was administered, and in a few minutes the child was seized with convulsions and died in twenty minutes. An inquest was held on the body by Dr. Biggar, of Lynden, and an analysis of the powders, which were believed to be composed of santonin, established the fact that they contained a quantity of strychnine. Dr. Walker, assisted by Dr. Davidson, held a *post mortem* examination on the body, and they reported that death might have resulted either from the diseased state of the kidneys or from strychnine. Evidence was produced to show that Dr. Shaver had purchased the powder, which he supposed was santonin, from Dr. Stark, druggist, of Hamilton; that Dr. Stark's santonin stock bottle had been examined and its contents analysed, and that it was found to contain a large portion of strychnine; and further, that Dr. Stark had purchased the santonin in question at the wholesale drug store of Winer and Co., Hamilton, where a further examination resulted in the discovery that their stock of santonin was mixed with strychnine. The verdict of the jury was to the effect that the deceased, George Henry Kent, came to his death by taking a powder composed mostly of strychnine, given by Dr. Shaver in mistake for santonin, and that the doctor obtained the same from Dr. Stark, of Hamilton, for santonin, who procured it from Winer and Co., and we hereby attach no blame to Dr. Shaver, but we would hereby advise druggists to be more careful in future.'

"It was extremely fortunate for Dr. Shaver that the inquiry was held, and that the evidence which led to the foregoing verdict was forthcoming, as without such clear proof that he was in no way to blame for carelessness it is just possible that the friends of the child and the public generally might have been forced to conclude that Dr. Shaver was to blame for the death of the child. As it is, however, we are glad to know that he has been thoroughly and completely exonerated. The facts developed at the inquest are of a startling character, however, as it is difficult to say where the mischief will end, as this mixed santonin and strychnine powder may have been distributed all over the country from the wholesale house in Hamilton.

"On the foregoing the Hamilton *Spectator* remarks:—'The fact that the unfortunate affair referred to above had occurred came to our knowledge a few days ago, but in the absence of particulars no mention was made of it at the time. In one or two points the *Banner's* statement is incorrect. Winer and Co.'s stock of santonin was not found to be mixed with strychnine. The portion which became mixed was all contained in a small bottle, and as it is positively known that this has not been "distributed all over the country," we are assured that the fears entertained by our contemporary are groundless.'"

HYDROBROMIC ACID IN PRESCRIPTIONS.*

BY DR. DEWITT C. WADE, MITCHIGAN.

It is not astonishing that hydrobromic acid is suggested so soon after its introduction to the profession as a remedy for many diseases, and in many combinations, for the salts of bromine have been as thoroughly tested by as large a number of physicians as any other known medicine, and have found a place second to few other remedies in value. These salts are undoubtedly generally given for the purpose of obtaining the effects of bromine upon the system; and if hydrobromic acid, in a more exact, scientific and eligible manner, accomplishes this object, it is not unreasonable to suppose that it will rapidly supplant them in the estimation of the intelligent prescriber.

To further call the attention of the profession to the great usefulness of this acid, I am induced to give a few formulæ into which it enters, which I have no doubt will

* From the *Druggists' Circular*, Nov. 1877.

at least have the merit of novelty. It is well known that medicines combined, not chemically, are thus often increased in value, and the convenience of so prescribing hydrobromic acid, if for no other reason, will generally make it preferable to the bromine salts.

I regret that in my paper proposing hydrobromic acid as a medicine, published in the *Peninsular Journal of Medicine* in February, 1875, I did not give a working formula for its preparation. I gave, instead, a theoretical formula, specifying that each fluid drachm of the finished preparation should represent ten grains of bromine, this being the amount of iodine in the same quantity of the officinal dilute hydriodic acid. Since then a formula has been published containing considerably less bromine, the result of which is likely to cause confusion, both with pharmacists and physicians. I think it proper to here give the original formula from which the first preparation was made, and which I shall now take the liberty of denominating dilute hydrobromic acid.

I.	Bromide of potassium	120 grains.
	Crystallized tartaric acid . . .	153 grains.
	Water	1 fl. oz.

Dissolve the salt and then the acid in the water, and place in cold water for several hours, or until precipitation ceases, and decant. The results of the reaction are the formation of bitartrate of potassium (cream of tartar), which is nearly insoluble, and sufficiently pure hydrobromic acid diluted with water, each fluid drachm of which contains ten grains of bromine. By preserving this proportion, any quantity can just as readily be made. For forty fluid ounces the following formula is exact enough for practical purposes:

II.	The bromide. . .	10 troy or 11 avoir. oz.
	The acid	$12\frac{3}{4}$ troy or 14 avoir. oz.
	Water	20 fl. oz.

Proceed as before.

The affinity of hydrobromic acid for bases is between that of hydrochloric and hydriodic acids. I have prescribed it most frequently in half drachm doses well diluted.

III.	Dilute hydrobromic acid,	
	Syrup, of each	1 fluid ounce.

Mix and write—teaspoonful in water.

This is not unpleasant to the taste, and may be given to obtain the constitutional effects of bromine as usually administered in combination with a base. It also acts like other mineral acids in being tonic, refrigerant, solvent, alterative, etc., and is very useful in the "bilious" conditions, including fevers, where the morbid symptoms recede with the coating on the tongue. I use little else in remittent fever.

IV.	Sulphate of quinia	15 to 80 grains.
	Dilute hydrobromic acid,	
	Syrup, of each	1 fluid ounce.

Mix and write—teaspoonful in water.

This is extremely bitter, and in this respect cannot be improved by other additions. Like other acidulous preparations, it is incompatible with licorice. Bromine has the power of modifying, in a marked degree, the cerebral effects of quinine; hence the value of its combination, aside from the alterative and other properties of the acid. In all cases of intermittent fever I continue an antiperiodic from ten to thirteen days after the paroxysm ceases, and for permanent and other satisfactory results, this combination has proved to be far superior in my hands to any other not containing the acid.

V.	Sulphate of cinchonia . .	15 to 45 grains.
	Dilute hydrobromic acid,	
	Syrup, of each	1 fluid ounce.

Mix and write—teaspoonful in water.

I can discover no difference in the effects of cinchonia and quinia, except that the latter is to be preferred as a stimulant. I prescribe cinchonia because of its cheapness.

VI.	Red iodide of mercury . . .	1 grain.
	Dilute hydrobromic acid . .	1 fluid ounce.
	Fluid ex. of orange peel,	
	Syrup, of each	4 fluid drachms.

Mix and write—teaspoonful in water.

The iodide of mercury is decomposed, the bromide being formed with the elimination of the iodine in the form of hydriodic acid. Mercury may be given in this manner for a long time without producing ptyalism, the salt being rapidly excreted.

VII.	Fluid extract of ergot,	
	Syrup, of each	4 fluid drachms.
	Dilute hydrobromic acid . .	1 fluid ounce.

Mix and write—teaspoonful in water.

I do not believe any other combination equals this for efficiency in cases of cerebral hyperæmia. It is not only indicated where venesection would appear beneficial, but it may be administered by enema in a case of intercranial hæmorrhage, with the likelihood of arresting the transfusion, by capillary restriction, when an additional depletion of the arterioles, by artificial abstraction of blood, would still further endanger life without influencing the hæmorrhage, and is consequently positively contra-indicated.

Ergot and hydrobromic acid will be found to be promptly useful in the vertigo of plethora, with confusion of ideas, or where a determination of blood to the brain is prone to occur from other causes.

VIII.	Fluid ext. of stramonium . .	160 drops.
	Dilute hydrobromic acid,	
	Syrup, of each	1 fluid ounce.

Mix and write—one-half teaspoonful in water, the dose to be increased until the specific effects of the stramonium are marked, and there to be maintained.

I offer this combination as a prescription for epilepsy. I will simply say of it that its effects in this disease are remarkable, and I think I have reason to consider it superior to any other plan of medication.

IX.	Tartar emetic	2 grains.
	Denarcotized tincture of opium	2 fluid drachms.
	Dilute hydrobromic acid . .	1 fluid ounce.
	Syrup, to make	2 fluid ounces.

Mix and write—teaspoonful in water.

For acute or chronic bronchitis.

X.	Syrup of bromide of iron . .	4 fluid drachms
	Bromide of quinia	16 grains.
	Dilute hydrobromic acid . .	1 fluid ounce.
	Syrup	4 fluid drachms.

Mix and write—teaspoonful in water.

The wide applicability of this tonic is readily suggested by its composition.

XI.	Subcarbonate of bismuth . .	80 grains.
	Dilute hydrobromic acid . .	1 fluid ounce.

Dissolve and add

	Saccharated pepsine	80 grains.
	Syrup, to make	2 fluid ounces.

Mix, filter and write—teaspoonful in water.

This is preferable to ammoniated citrate of bismuth with pepsine, because it is not only permanent in the bottle, but it is not precipitated in the stomach, as is the citrate. Its indications are evident to the professional reader. To it may be added pancreatine, with or without the pepsine.

I trust I have shown by the foregoing formulæ how readily bromine may be exhibited in a elegant manner, combined with other well known remedies. These formulæ, however, are only intended as skeletons, upon which a great variety of changes may be rung to suit the "notions" of the prescriber.

Elixirs instead of syrups may be substituted, and additions of flavours may be made to render the medicine more palatable. The doses are for adults, and the frequency of their repetition in each case is to be determined in accordance with the circumstances.

Sedation is an indication in almost all diseased conditions, not only as a palliative, but to finally obtain radical results, by the greater curative efforts nature may make in the absence of irritation, aided, if necessary, by artificial means. It is no surprise, then, that the only known mineral sedative, being also a powerful alterative, should have found so prominent a place in the medical art; yet taking into consideration the facts that the salts of this drug are the preparations of it almost universally prescribed, and that they must be decomposed in the stomach and hydrobromic acid produced before the effects of bromine can be obtained in any case, and that these salts cannot conveniently be combined with other medicines, it is an easy matter to gain the impression that, in the light of our present knowledge, there are too many who follow a very clumsy and unscientific method of exhibiting one of our most valuable therapeutic agents.

SCHEME FOR THE RECOGNITION OF THE MORE IMPORTANT RESINS, GUM RESINS, AND BALSAMS.*

BY EDWARD HIRSCHSOHN.

In continuation of the author's researches on ammoniacum, galbanum, sagapenum, and opoponax, an account of which has already appeared in this Journal,† he has made a comparative examination of a large number of the more important resins, gum resins, and balsams. The results have been published in an inaugural dissertation written upon attaining the grade of "magister der pharmacie." This thesis contains a table for the recognition of these substances by their behaviour towards reagents. The following are the reagents used:—

1. Sulphuric acid, sp. gr. 1·820.
2. Alcoholic hydrochloric acid, obtained by saturating 95 per cent. alcohol with dry hydrochloric acid gas.
3. Bromine solution, 1 part of bromine in 20 parts of chloroform.
4. Saturated solution of chloride of lime in distilled water at the ordinary temperature.
5. Alcoholic solution of perchloride of iron, 1 part in 10 parts of 95 per cent. alcohol.
6. Saturated solution of neutral lead acetate in 95 per cent. alcohol.
7. Solution of ammonia, sp. gr, ·980.
8. Solution of pure sodium carbonate crystals in distilled water.
9. Frohde's test: 1 centigram of sodium molybdate in 1 c.c. sulphuric acid.
10. Impure chloral hydrate, containing alcoholate.
11. Saturated solution of iodine in petroleum spirit boiling at 60° C.

Completely soluble in Chloroform.

Completely soluble in Ether.

A. Ethereal solution becomes turbid after addition of alcohol.
- I. Alcoholic solution gives with perchloride of iron a turbidity that disappears on boiling. Chloral reagent colours violet . . . . *Canada Balsam.*
- II. Alcoholic solution gives no turbidity with perchloride of iron.
  - 1. The drug is liquid and forms a clear mixture with petroleum spirit boiling below 40° C.
    - *a.* Bromine solution colours the chloroform solution yellowish, then violet and blue *Maranha Copaiba Balsam.*
    - *b* Bromine solution produces no colour *Peru Copaiba Balsam.*
  - 2. The drug is solid and dissolves only partially in petroleum spirit. Iodine solution colours red violet . . . . *Ordinary Mastic.*

B. Ethereal solution forms clear mixture with alcohol.
- I. Perfectly soluble in alcohol.
  - 1. Perchloride of iron colours the alcoholic solution blue.
    - *a.* Lead acetate gives a precipitate with alcoholic solution. Sulphuric acid dissolves the drug with a cherry red colour . . *Guaiacum Resin.*
    - *b.* Lead acetate gives no precipitate. Sulphuric acid dissolves the drug with a yellow brown colour *Carana Resin (Aceyta americana).*
  - 2. Perchloride of iron colours the alcoholic solution brownish or greenish.
    - *a.* Lead acetate gives with the alcoholic solution a precipitate that is not dissolved by boiling.
      - α. Sodium carbonate solution dissolves parts at the ordinary temperature. Chloral test colours the residue from the evaporation of a petroleum spirit extract gradually red violet with blue streaks. . . *Coniferous Balsams and Resins.*
      - β. Sodium carbonate dissolves none or a very small quantity.
        - † Petroleum spirit extract colourless. Chloral test produces no colour or a very faint greenish *Bombay Mastic.*
        - †† Petroleum extract coloured.
          - ‡ Dark brown. Chloral test colours brown *Mani Resin.*
          - ‡‡ Yellow-brown. Chloral test colours gradually indistinct red violet . . . *Carana Resin.*
          - ‡‡‡ Yellow-brown. Chloral test and bromine solution colour a magnificent violet *Carana hedionda.*
    - *b.* Lead acetate gives with alcoholic solution a precipitate that dissolves on boiling.
      - α. Bromine solution colours red *Peruvian Guaiacum Resin.*
      - β. Bromine solution produces no coloration *Alexandrian Mastic.*
    - *c.* Lead acetate gives no precipitate. Ammonia gives a turbid mixture . . . *Dragon's Blood.*
- II. Imperfectly soluble in alcohol.
  - 1. Lead acetate produces turbidity which disappears upon warming . . *Brazilian Copaiba Balsam.*
  - 2. Lead acetate gives no precipitate. The drug is clearly crystalline. Sodium carbonate does not dissolve it by boiling.
    - *a.* Bromine solution gradually colours green.
      - † Alcoholic hydrochloric acid colours violet, blue, or brown . . . . *Elemi.*
    - *b.* Bromine solution colours violet . . . . *Elemi.*
    - *c.* Bromine solution produces no colour *Elemi (Amyris elemifera).*

Imperfectly soluble in Ether.

A. Perfectly soluble in alcohol.
- I. Sulphuric acid colours the residue from evaporation of a petroleum spirit extract cherry red. The drug is free from cinnamic acid . *Siam Benzoin.*
- II. Sulphuric acid does not colour such residue, or only faintly light brown. Contains cinnamic acid *Sumatra Benzoin* or *Tolu Balsam.*
- III. Sulphuric acid colours such residue yellow-brown passing into violet . . . *Black Peru Balsam,*

B. Imperfectly soluble in alcohol.
- I. Perchloride of iron gives a precipitate, which is neither dissolved by boiling nor soluble in ether *Brazilian Copal.*
- II. Perchloride of iron produces no turbidity or only a slight one that disappears on boiling.
  - 1. The ethereal solution gives with alcohol a turbid mixture.
    - *a.* Alcoholic hydrochloric acid colours it brownish. Chloral test colours evaporation residue of petroleum spirit extract greenish . . . *Dammar.*

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* *Pharmaceutische Zeitschrift für Russland*, xvi., 81.
† *Pharm. Journ.* [3], vol. vii., p. 369, etc.

b. Alcoholic hydrochloric acid colours it brick red. Chloral test colours the petroleum spirit residue carmine red to violet . . *White Peru Balsam.*

2. Ethereal solution gives with alcohol a clear mixture.

a. Ammonia gives with alcoholic solution a clear mixture. Bromine solution colours blue *Ceradia Resin.*

b. Ammonia gives with the alcoholic solution a turbid mixture. Bromine solution colours greenish *Mecca Balsam.*

Imperfectly Soluble or Insoluble in Chloroform.

Completely soluble in Ether.

A. Ethereal solution red. Ammonia gives with alcoholic solution a clear mixture *Dragon's Blood from Pterocarpus Draco.*

B. Ethereal solution yellowish or colourless.

I. Alcoholic solution gives with lead acetate no precipitate . . . . *Podocarpus Resin.*

II. Alcoholic solution gives with lead acetate a precipitate that is not dissolved by boiling . *Sandarac.*

Imperfectly soluble in Ether.

A. Ethereal solution becomes turbid after addition of alcohol.

I. Alcoholic solution gives with ammonia a clear mixture.

1. The mixture with ammonia is yellow. The solution of the resin in sulphuric acid is yellow brown and gives with alcohol a clear violet mixture *Eryops Resin.*

2. The mixture with ammonia is carmine red *Sonora Lac.*

II. Alcoholic solution gives with ammonia a turbid mixture.

1. Perchloride of iron colours green. The drug contains cinnamic acid. Lead acetate gives a precipitate . . . . *Liquid Storax.*

2. Perchloride of iron colours brownish or not at all.

a. The drug contains cinnamic acid, and gives with lead acetate no precipitate *Liquidambar Balsam.*

b. The drug contains no cinnamic acid, and gives with lead acetate a precipitate *Euphorbia Tirocalli Resin.*

B. Ethereal solution gives with alcohol a clear mixture.

I. Perfectly soluble in alcohol. Perchloride of iron colours dark brown or black.

1. Solution in alcohol is red.

a. Lead acetate gives no precipitate. Chloroform extract colourless *Xanthorrhœa quadrangularis Resin.*

b. Lead acetate produces turbidity. Chloroform extract yellow. . *Xanthorrhœa arborea Resin.*

2. Alcoholic solution yellow. Lead acetate produces a precipitate . . . *Yellow Xanthorrhœa Resin.*

II. Imperfectly insoluble in alcohol.

1. Alcoholic solution gives with ammonia a clear mixture.

a. Ammoniacal mixture is violet. Lead acetate gives a violet precipitate . . . . . . *Lac.*

b. Ammoniacal mixture is yellow or colourless.

α. Perchloride of iron colours the alcoholic extract black. Lead acetate gives no precipitate *Gamboge.*

β. Perchloride of iron gives a precipitate which is neither soluble in ether or by heating. Lead acetate gives a precipitate.

† Readily and completely soluble in ether-alcohol.

‡ Bromine solution precipitates the resin from the chloroform solution . *Australian Copal.*

‡‡ Bromine solution produces no precipitate. *Manilla Copal.*

†† Imperfectly soluble in ether-alcohol *East Indian Copal.* *African Copal.*

2. The alcoholic solution gives with ammonia a turbid mixture.

a. Perchloride of iron gives a precipitate that is neither dissolved by boiling nor in ether *Borneo Copal.*

b. Perchloride of iron gives no precipitate.

α. Completely soluble in ether-alcohol. Chloral test colours residue from evaporation of petroleum spirit extract blue to blue violet *Liquidambar styraciflua Balsam.*

β. Incompletely soluble in ether-alcohol.

† The drug contains sulphur.

§ Yields umbelliferon by dry distillation.

‖ Hydrochloric acid colours the petroleum spirit extract residue reddish yellow; the chloral test colours it green *Persian Sagapenum.*

‖‖ Hydrochloric acid colours the residue blue violet; chloral test colours it rose colour to raspberry red and violet *Levant Sagapenum.*

‖‖‖ Not coloured by hydrochloric acid. The solution of the drug in sulphuric acid is yellow brown with a blue fluorescence. Potassium nitrate colours the gum resin malachite green . *Ordinary Asafœtida.*

§§ Yields no umbelliferon by dry distillation.

‖ Sodium carbonate solution colours the drug light brown, and the extract is not altered by acetic acid or lead acetate *Asafœtida from Ferula alliacea.*

‖‖ Sodium carbonate solution forms an emulsion that cannot be filtered.

° Lead acetate gives no precipitate. Iodine solution is not altered . *Indian Bdellium.*

°° Lead acetate produces immediately or after a short time a precipitate that dissolves upon warming. Iodine solution is not altered . . . . . *African Bdellium.*

‡‡ The drug contains no sulphur.

§ Yields umbelliferon by dry distillation.

‖‖ The petroleum spirit extract residue is coloured by hydrochloric acid and the chloral test.

° Hydrochloric acid colours reddish yellow; the chloral test colours green *Persian Galbanum.*

°° Hydrochloric acid colours red violet; the chloral test colours greenish *Levant Galbanum as at present in commerce.*

°°° Hydrochloric acid colours violet blue; the chloral test carmine red *Older specimens of Levant Galbanum.*

‖‖ Hydrochloric acid gives no colour; the chloral test colours light brown *African Ammoniacum.*

§§ Yields no umbelliferon by dry distillation.

‖ Chloride of lime solution colours the gum resin orange yellow *Persian Ammoniacum.*

‖‖ Chloride of lime solution produces no colour. Lead acetate gives no precipitate.

° Iodine solution is not altered; the chloral test colours greenish . . . *Olibanum.*

°° Iodine solution is not altered; the chloral test gives no colour . *Indian Myrrh.*

‖‖‖ Chloride of lime solution produces no colour. Lead acetate gives a precipitate.

° Bromine solution colours violet red; the chloral test colours violet *Ordinary Myrrh.*

°° Bromine solution produces no colour or only yellowish. Perchloride of iron colours green . . . . *Opoponax.*

°°° Bromine solution produces no colour or only yellowish. Perchloride of iron colours brownish . . *Euphorbium.*

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THE RESPONSIBILITY FOR PROSECUTIONS UNDER THE SALE OF FOOD AND DRUGS ACT.

ALTHOUGH it is only a month since that attention was called in these columns to some flagrant instances of the misapplication of the Sale of Food and Drugs Act, the cases reported on another page will be seen to fully justify an early reversion to the subject. It is true that our remarks on former occasions have been misconstrued, by ostentatious purists who have been either incapable or unwilling to see the facts of the case, into a defence of the dishonest trader; but we believe that there is no surer way to the Act passed for the protection of the public becoming a dead letter than by its being applied oppressively and without judgment, in such a manner that escape from unjust penalties should be dependent not upon the trader's guilt, but upon his ability to spend money in his defence.

At the Selby Petty Sessions, held on Monday last, a firm of pharmaceutical chemists was charged with two offences under the Act. In the face of known facts, and especially of recent magisterial decisions based upon them, it is astonishing to find that once more respectable tradesmen have had to defend themselves from imputations of fraud because they have sold soda water that did not contain 30 grains of bicarbonate of soda to the pint. Had the soda water been simply the aërated beverage that the public, as a rule, ask for under that name, such a proceeding would be indefensible; but the water did contain equal to about 7 grains of bicarbonate of soda to the pint, and, in the words used by the analyst in his certificate, "Regarded as an effervescent drink the sample was perfectly free from objection." Considering that in a very great majority of cases it is as an effervescent drink that soda water is purchased by the public, it does appear to be the height of absurdity, as well as a gross injustice, to impute fraud to the seller who does not make his soda water according to the formula given for medicinal purposes in the Pharmacopœia. It would only be consistent to attempt to stop all sales of mineral acids that would not pass the tests given in the same work.

The other charge was for selling cayenne pepper adulterated with common salt and red ochre, or some other ferruginous material. The "chemical and microscopical" evidence upon which the imputation of fraud was based was of the flimsiest description. Because oxide of iron equal to 1 part in 1000 was found in the ash, the conclusion was jumped at that the pepper had been "coloured," and the result of an application of a test for chlorides and crystals seen under the microscope was considered a sufficient basis for a charge of an admixture of common salt.

We will do the analyst the justice to quote his assertion that from the result of his "analysis" he would not have recommended a prosecution in this case. But it would be very interesting to know who is responsible for the prosecution. According to the report, a police superintendent, who made the purchases, acted as prosecutor. Although the singular obtuseness manifest in the proceedings might be thus sufficiently accounted for, it can hardly be supposed that he has been acting *en amateur* and without instructions from the local authority. If he has, the sooner his employers relegate him to his proper duties the better it will be. However this may be we cannot altogether acquit the public analyst from responsibility. Although he may not have directed the prosecution he seems to have baited the trap into which somebody else has fallen. When a presumed scientific man reports that he has found common salt in a sample of pepper, and goes on to say that "salt is frequently added to cayenne pepper to increase the brightness of the colour," and further that the sample has been "coloured" by some other substance, it is at least suggestive to the more ignorant mind looking to him for guidance that something wrong has been done; the sequence then is a natural one.

The beer case tried at the Bath Police Court was even worse than those above referred to; for there an attempt was made to prove adulteration not only upon inadequate grounds but in regard to the alleged presence of a material that is allowed to be used as a bitter.

We think the time has arrived for raising the question whether in cases of alleged infringement of the Food and Drugs Act, the power of prosecution should be left in the hands of local bodies, unqualified themselves to decide cases upon the merits of the results certified to by the analyst, and liable to miscontrue, or even to be misled by those to whom they look for advice to an extent in excess of their power of guidance. Fortunately fraudulent adulteration has not proved to be so prevalent as was expected in some quarters, and there would be nothing to preclude the submitting in future of all cases of supposed offences under the Food and Drugs Act to the judgment of some central competent authority before commencing prosecutions. Such a course would have the advantage of relieving public public analysts from the exercise of functions beyond their competence, viz., that of deciding whether an admixture or impurity in any article is injurious to health. Moreover, there are other things to be considered besides the silly fears of a section of the public. It should be remembered that even when the tradesman succeeds in repelling an unjust charge of adulteration, it often, as in the present case, involves a considerable expenditure of time and money, and sometimes a damaged reputation. Too frequently, however, the defendant is incompetent single-handed to offer a proper defence; guilt is then assumed, and conviction follows very often upon the mere *ipse dixit* of the public analyst, a foundation which has been too often proved untrustworthy. We consider that in conducting the defence of Messrs. CUTTING to a successful issue, the Chemists and Druggists' Trade Association has rendered a valuable service not only to chemists and druggists, but to the community.

THE STATE OF THE GASTRIC JUICE IN TYPHOID.

THE *Berliner Klinische Wochenschrift* gives the history of a case in Professor Kussmaul's clinique at Strassburg, which tends to show that during the dyspeptic stage in typhoid fever the gastric juice contains no free hydrochloric acid, though pepsine is abundantly present, as has been already proved by Hoppe-Seyler and Parry. If the juice shows acid reaction this is due to either acetic or lactic acid, but it may, as Kussmaul's case shows, become alkaline from the presence of bile or pancreatic juice after retching or vomiting. The absence of hydrochloric acid lasted as long as the fever, and up to the eighth day after its disappearance, proving the old maxim by which typhoid reconvalescents are forbidden solid food for that period. As Professor Kussmaul's assistant points out, the great advantage of giving hydrochloric acid in fevers is confirmed by this case. He also mentions the experiments made on dogs by Manasseïn in Hoppe-Seyler's laboratory, in which by injecting putrid liquids into their veins and creating fever the quantity of free hydrochloric acid in proportion to the pepsine became diminished. Some old notes, made of similar experiments in Hoppe's laboratory at Berlin nearly twenty years ago, confirm this as far as the reaction of acidity by test paper goes. The gastric juice of dogs is normally always strongly acid and this acidity is mainly due to a normally high proportion of hydrochloric acid. As Rabuteau stated only a few years ago, in the *Comptes rendus*, it amounts on an average to 4 per mille or 0·4 per cent.

EUCALYPTUS AND PHARMACY IN BRAZIL.

IT appears that tincture of *Eucalyptus globulus* is manufactured on rather a large scale in Brazil, where intermittent and remittent fevers prevail extensively in the low coast and river regions, and also in the valleys and backwoods of the uplands. Dr. Senftleben, who has just returned from a twelve months' expedition to the different parts of the southern empire, informs us that the Eucalyptus tincture is used by the native doctors and as a popular medicine mostly in obstinate cases, especially when relapses occur. This tallies with the reports of the Austrian practitioners who treated cases of ague contracted in the swampy river countries of Hungary. In fresh or protracted cases of intermittent fever, where no remarkable enlargement of the spleen has yet taken place, quinine is by far the most reliable febrifuge. But where an "ague cake" has formed and the recurring attacks depend rather on the locally remaining of the diseases, the Eucalyptus in doses of a half or one fluid drachm twice or three times a day for a week or a fortnight proves the more useful drug. The Eucalyptus trees grown in Brazil and the river Plate countries are said to be less fragrant than the Australian and to yield less aromatic oil, which is evidently due to the richer, more clayey soil and the moister climate.

EXPLOSION WHILE PREPARING OXYGEN.

ANOTHER fatal accident while preparing oxygen is reported from Ireland. The information elicited at the inquest does not appear to have thrown much light upon the cause of the explosion. We are informed by a correspondent that a tutor in a school at Moira, who had performed the operation frequently before, wishing to prepare some oxygen, introduced a mixture of 2 lbs. of potassium chlorate and 1 lb. of manganese peroxide into an iron mercury bottle and placed it on a hot fire in a stove. Shortly afterwards an explosion took place, which killed one boy who was present and injured two others. The stove was blown to fragments, carrying away the windows, ceiling, etc., while the detonation was so loud as to be heard at a distance of two miles. Considering the frequency with which oxygen is now prepared under similar circumstances, it would have been interesting to have had it cleared up whether the accident was due to the too rapid evolution of gas, a faulty retort, or to the presence of a foreign ingredient in the mixture similar to that which resulted in an explosion at Irishtown in 1875.

MUNICIPAL HONOURS TO PHARMACISTS.

AMONGST the gentlemen to whom the 9th of November has brought municipal honours we notice the names of several pharmacists. At Bedford Mr. JOHN USHER TAYLOR, Pharmaceutical Chemist, has been elected Mayor. At Haverfordwest, Mr. WILLIAM WILLIAMS, Pharmaceutical Chemist and Local Secretary of the Pharmaceutical Society, has been unanimously chosen Mayor of the borough and "Admiral of the Port." At Lincoln, Mr. WILLIAM COTTINGHAM, Chemist and Druggist, has been elected Mayor. Mr. HENRY DAVID SIMPSON, Chemist and Druggist, has been re-elected Mayor of Louth. Mr. JOHN AVERILL, Pharmaceutical Chemist, also a Local Secretary of the Pharmaceutical Society, has been unanimously elected Mayor of Stafford. Finally, Mr. ALEXANDER BOTTLE, Pharmaceutical Chemist, and a Member of the Council of the Society, has been elected an Alderman at Dover.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A MEETING of the above Association will be held at 17, Bloomsbury Square, W.C., on Thursday evening, November 22, at 8 o'clock, when a paper will be read by the Secretary, Mr. H. G. GREENISH, on "The Microscope, and its Application in Pharmacy."

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The opening meeting of the new session of the above Association was held in the Manager's Library, Anderson's College, on Friday evening, 9th inst., the President (Mr. Daniel Frazer) occupying the chair. Mr. J. M. Fairlie, Vice-President, acting as Secretary, *pro tem.*, read minutes of the previous meeting, which were approved, and also submitted reports. Letters of resignation from Mr. Jas. L. MacMillan, Secretary, and Mr. Jas. Murdoch, Librarian, were read, both of whom have left the city, and in their stead Mr. John Walker (Glasgow Apothecaries' Company), 34, Virginia Street, was appointed Secretary, and Mr. Wm. McKenzie, 17, Great Western Road, Librarian.

A further donation of books from the Executive of the British Pharmaceutical Conference, comprising Hanbury's 'Science Papers,' and Hanbury and Flückiger's 'Pharmacographia,' was laid on the table, and the Secretary was instructed to acknowledge the receipt of the same, with the Association's best thanks.

The President then made a few introductory remarks, impressing upon members and others the benefit to be derived from mutual association, touching upon the Preliminary examinations, and lamenting the high percentage of failures, and suggested the desirability of approaching the Pharmaceutical Society on the subject. He also submitted the report of the deputation (viz. Mr. Davidson and himself) to the Pharmaceutical Conference held at Plymouth, and spoke in praise of the kindness shown them by the local committee there.

Mr. Fairlie moved, and Mr. Kinninmont seconded:—"That it be remitted to the Council of the Association to consider the desirability of approaching the Council of the Pharmaceutical Society, with reference to the Preliminary examinations."

Dr. J. M. Milne, lecturer on chemistry, etc., who was then introduced to the meeting, read a paper entitled "Some Notes on the Application of Chemical Knowledge" in which he traced the advance and domain of chemistry, and the practical application of the science in the arts and manufactures, impressing on the audience the necessity and advantage of test experiments, and advocating a course of study in practical chemistry. The lecturer also referred at some length to the Adulteration Acts, showing defects in the framing and working of the same, and pointed out that the analyst under the Act should have, besides his analytical experience, a knowledge of the art and manufacture of the article under examination.

On the motion of the chairman, a very hearty vote of thanks was accorded the lecturer for his interesting and instructive paper.

The following classes in connection with the Association were intimated:—1st. Tutorial Class, for Preliminary; 2nd. Theoretical Chemistry Class; 3rd. Practical Pharmaceutical Chemistry Class, particulars of which may be learned from the Secretary.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

The first meeting of the above Association for the present session was held at 17, Bloomsbury Square, on Thursday evening, November 8; Professor Attfield, President, in the chair. There were present 29 members and 1 visitor.

The Secretary read the minutes of the previous meeting, including a report of the work of the Association during the past session. The report stated that there had been nineteen meetings, with an average attendance of twenty-five members. In addition to the President's address (already reported in the *Pharmaceutical Journal*), twenty-three papers had been read and discussed, as follows:—"Magnetism," by Mr. Charles Hutchinson; "Arnot's New Test for Potassium," by Dr. A. Senier, F.C.S., and Mr. H. Campbell; "Dispensing Queries," by Mr. Campbell; "The Microscope," by Mr. J. C. Shenstone; "Emulsions," Mr. W. B. Tuck; "The Signs used to Decorate the Show Bottles of the Pharmacist," by Mr. J. H. Hugill; "Faraday," by Mr. W. R. Atkins; "Diagnosis of the Principal Natural Orders," by Mr. E. M. Holmes, F.L.S.; "Radiometer," by Mr. C. J. Mead; "Fermentation," by Mr. G. F. Gutheridge; "The Common Metals and their Chief Uses," by Mr. A. P. Luff, F.C.S.; "The Starches," by Mr. G. Bullen; "The Occurrence of Cinchonidine in Quinine," by Mr. R. W. Parker; "Oxalate of Cerium," by Mr. H. G. Greenish; "Analysis of Scale Compounds and Alkaloids," by Dr. A. Senier, F.C.S.; "Luminosity of Flame," by Mr. H. Senier, F.C.S.; "Practical Dispensing," by Mr. C. Shapley; "Methods of Flower Fertilization," by Mr. J. Savory; "Poisons," by Mr. Rickarby; "Iles's New Test for Boracic Acid," by Mr. S. Hardwick; "Method of Producing Voltaic Electricity," by Mr. E. Richardson; "Atomic Theory," by Mr. C. Hutchinson; "Theories of Darwin concerning Evolution," by Mr. E. Richardson.

The election of officers was next proceeded with; Mr. Ashweek and Mr. Dunstan being appointed a committee to examine the voting papers.

During this examination a discussion was introduced by the President on the management of the Association, in which Messrs. Gadd, Naylor, and Atkins took part.

The report of the committee on elections was then read, and the following gentlemen were declared officers for the session 1877–78:—

Vice-Presidents, Mr. John F. Savory and Mr. W. R. Atkins; Committee, Mr. R. H. Parker, Mr. William B. Mason, Mr. Henry Allen, Mr. J. Graham Sangster; Secretary and Treasurer, Mr. H. G. Greenish, 17, Bloomsbury Square, W.C.

The President then addressed the members on the subject of education generally, more especially on the modes by which the knowledge acquired by pupils in the primary, secondary, and other schools throughout England is commonly gauged, urging the value of knowledge for its own sake, and particularly the kind and quality of knowledge which was too deep and subtle to be probed by examinations as ordinarily conducted.

The Secretary then announced that a paper would be read at the next meeting, November 22, and with a vote of thanks to the President the proceedings terminated.

Parliamentary and Law Proceedings.

Quassia in Beer.

At the Bath police court, on Monday, Nov. 5, Mr. Henry Arnold, brewer, was summoned for unlawfully selling a certain article of food, to wit, a half-gallon of beer, which was not of the nature, substance and quality of an article of food demanded of him. Mr. F. H. Moger supported the prosecution on behalf of the Sanitary Committee of the Urban Sanitary Authority, and Mr. Bartrum for the defendant.

Mr. Montagu, inspector, was called and deposed to purchasing the beer in question on the 8th of October. Mr. Arnold declined his offer to return him part of the beer. He handed it to Mr. Gatehouse, city analyst, and from him received a certificate of analysis which he handed in. The certificate stated that the component parts of the beer were, water 87·42, extractive matter 7·38, and alcohol 5·20 parts, and stated as the opinion of the analyst that the sample contained the foreign ingredient quassia. Mr. Moger asked upon the certificate for the imposition of a penalty.

Mr. Payne said that for some purposes quassia was legal. It might be used as a substitute for hops.

Mr. Moger: Under an Act of George III. the brewers were liable to a heavy penalty if quassia was found on their premises. That Act, however, had been repealed.

Mr. Bartrum said it was for the prosecution to prove that quassia had been introduced into the beer, which was a compound article.

Mr. Moger observed that he treated it entirely as an article of food. He further stated that the certificate of the analyst was the proof required by the Act, but after some discussion called Mr. Gatehouse, who deposed to the accuracy of the certificate.

Mr. Gatehouse was cross-examined at length by Mr. Bartrum as to the methods by which he tested the beer. He said there was great difficulty in distinguishing between the bitters in beer. The chemical results obtained from wormwood and quassia were very similar. Was not aware that a premium of 1000 francs was offered by the Academy of Sciences in France to any chemist who could distinguish between the bitters in beer. By the Bench: I should not like to swear there is no other bitter in the world besides quassia that would produce the results obtained by my tests.

Mr. Bartrum then addressed the Bench, saying that although Mr. Gatehouse might be a good chemist, he had not the practical experience which was desirable in a public analyst. The trade in Bath had much reason to complain of a young man being placed in a position where his analysis might affect the trade in a most signal way. Here was a most respectable brewer liable to be deprived of his business by a dash of the pen upon the idea of an analyst. He should be able to show that Mr. Gatehouse had made a gross and palpable mistake.

Mr. Arnold was called and said his beer was composed entirely of malt, hops, saccharine and Bath City water. He denied absolutely that any other ingredient had been used. He did not know what quassia was. A sample of hop substitute from Wolverhampton had been sent him, but he ordered it to be destroyed.

Defendant's son and a brewer in his employment were called to substantiate this evidence.

Mr. W. W. Stoddart, public analyst for the county of Somerset and city of Bristol, was next called. He said he had examined over 200 samples of beer this year by order of the county magistrates, and had a large analytical practice among brewers. He did not believe there was any reliable test for quassia in beer. Had heard Mr. Gatehouse's evidence and would not have given a certificate upon the tests he had used. Had found quassia mixed with hops in numerous samples of beer but never dreamt of giving a certificate on them, as the instructions issued to the Government officers stated that any bitter might now be legally used in brewing. If quassia was used to any extent it would make the beer intolerably bitter. It would give only three or four ounces of extract from a hundredweight, and the only test he should rely on would be actually to see the dregs among the spent hops. Quassia was very frequently used by respectable brewers. It was an ingredient of hop substitutes which are openly sold. He never regarded quassia as an adulteration of beer because he did not know what beer was really. Quassia would not be deleterious, but if much of it was used the beer could not be drunk, it would be so bitter. Other substances besides quassia would produce the results Mr. Gatehouse had given. As a public analyst he should not consider that an to be adulteration which is allowed by the Excise.

The Magistrates retired to consider the case and on their return after a few minutes' absence, Mr. Blaine said it was the opinion of the Bench that the prosecution had failed, and the case was therefore dismissed. They wished to express their opinion that Mr. Arnold left the court without a stain upon his character as an honest tradesman. The costs of Mr. Bartrum and Mr. Stoddart would be allowed.—*Bath Herald.*

Prosecutions under the Sale of Food and Drugs Act.

At the Selby Petty Sessions on Monday, the 12th inst., before C. M. Weddall, Esq., and W. T. Smith, Esq., Messrs. Cutting and Son, Pharmaceutical Chemists, Finkle Street, Selby, were summoned under the Sale of Food and Drugs Act, 1875, for selling on the 11th September last, three bottles of soda water which were not of the quality required by the Act. Police Superintendent Gill prosecuted, and Messrs. Cutting and Son were defended by Mr. Henry Glaisyer, LL.B., under instructions from the Chemists and Druggists' Trade Association.

Mr. Gill stated that on the 11th of September, he purchased of Mr. T. J. Cutting three bottles of soda water, for which he paid ninepence. He told Mr. Cutting they were required for analysis. They were sealed, and one was sent to Mr. Alfred N. Allen, the public analyst for the West Riding of Yorkshire, one he retained in his own possession, and the third he left with Mr. Cutting. The analyst certified as follows:—"The sample of soda water was quite free from lead and other poisonous metals. The sample contained an amount of bicarbonate of soda, not exceeding about seven grains to the pint. Regarded as an effervescent drink the sample was perfectly free from objection; as a remedy it was deficient in soda, the amount of bicarbonate of soda in the soda water of the Pharmacopœia being thirty grains to the pint."

Mr. Glaisyer having called Mr. Gill's attention to that portion of the certificate which stated that as a beverage it was perfectly free from objection, inquired if he was aware there were two kinds of soda water.

Mr. Gill replied in the affirmative, but said he asked simply for soda water.

Mr. Gill then called Mr. Alfred Henry Allen, the public analyst for the West Riding of Yorkshire, North Derbyshire, and Sheffield.

Mr. Allen having explained the result of his analysis of the soda water as given in his certificate, he was cross-examined by Mr. Glaisyer as to the different qualities of soda water, their constituent properties, and their uses.

Mr. Allen said as a beverage Mr. Cutting's soda water was free from objection. He, however, drew a distinction between soda water as a beverage and soda water as a remedy; if he went to a druggist's shop and asked for a bottle of soda water he should expect to get the B. P. preparation, that was soda water made according to the standard prescribed by the British Pharmacopœia, which required that there should be thirty grains of soda to the pint, or fifteen grains to the bottle. If he asked for soda water at an hotel, or place of refreshment, he should expect to get an article prepared as a beverage with less soda in it. He had at different times examined one or two dozen samples; of these one contained no soda, some had a small quantity, while others had the full amount.

Mr. Glaisyer: Is soda water prepared according to the Pharmacopœia adopted as a beverage?—As a beverage only it contains too much soda.

Is the Pharmacopœia soda water such as a person would ordinarily take?—It is very nasty and would not agree with one.

As a beverage do you consider this a fair sample?—As a beverage it is unobjectionable.

And as a remedy?—That is a question for the magistrates to settle.

You tested it for lead?—Yes, but I found none. The total alkalinity of the water was equal to nearly seven and a half grains to the pint, this would give about three and a half grains to the bottle.

Mr. W. T. Smith: There was not in the sample a sufficient quantity of bicarbonate of soda as required in the official article, and if a medical man sent a patient for soda water it was important the article supplied should possess the proper quantity of soda.

Mr. Glaisyer: The summons does not treat this soda water as a "remedy," but as an "article of food," and I contend that as such it is unobjectionable, and contains a sufficient quantity of bicarbonate of soda. If Mr. Gill had asked for the Pharmacopœia preparation, *liquor sodæ effervescens*, he would have been supplied with it; but he asked for soda water, and he got soda water as it is usually prepared. There were two distinct kinds of soda water manufactured—one for medicinal purposes and the other to be consumed as a beverage. What was sold to Mr. Gill was soda water proper, and was an entirely distinct article from the soda water of the Pharmacopœia.

Mr. Glaisyer then called Mr. Thomas John Cutting, who said that he had sold soda water for twenty-eight years, during which time he had no complaints and his trade had increased. Dr. Todd was one of his customers, and he had expressed great satisfaction with it. He kept the Pharmacopœia or medicinal soda water, but he did not sell it unless it was specially asked for; he should not like to drink it regularly as it left a disagreeable soapy taste in the mouth.

Dr. John Attfield, Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, and a member of the Council of the Chemical Society, was examined by Mr. Glaisyer. He said that from his experience of soda water there were three articles sold under that name. There was aërated water, which contained no soda at all; there was a second kind which was a mixture of aërated water, bicarbonate of soda in quantity varying from two to eight grains to the bottle; and there was a third kind known as the medicinal article or *liquor sodæ effervescens*, also known as the B. P. soda water. This was introduced into the Pharmacopœia that physicians might have a medicinal article of constant strength. The official variety had a disagreeable soapy or alkaline taste, from the quantity of soda which was introduced into it. No. 2 was more or less soapy, and it was within his knowledge that the public objected even to this. What the public generally required was simply aërated water without even the two or three grains of bicarbonate of soda to the bottle. That aërated water should be called soda water was the fault, if fault it was, of the public. The vendor was helpless in the matter. When there was an excess of acid in the stomach, No. 3 was the very thing that was wanted, but it could only be taken as a medicine, Of the three bottles of soda water which Mr. Cutting sent him, under the seal of the police, one contained seven grains, and the other two somewhat more of bicarbonate of soda per pint. There was a little difficulty in mixing the bicarbonate of soda, so that it frequently happened the quantity would vary in a few bottles. He never found thirty grains per pint in any but medicinal soda water. He quite agreed with what Mr. Allen had said that the medicinal soda water would be very deleterious if taken constantly, weakening the action of the gastric juice.

The Chairman, after deliberating some time with Mr. Smith, said they had fully considered the case. They thought there had been less soda than there ought to have been, but having regard to the professional evidence they had decided to dismiss the case.

Alleged Adulteration of Pepper.—The same defendants were then charged with having sold two ounces of cayenne pepper adulterated with common salt and coloured with red ochre or some similar ferruginous material. The pepper was bought by Mr. Gill, on the 11th September, and Mr. Cutting was told for what purpose it was required. It was divided into three portions, one being sent to Mr. Allen in a registered letter, one kept by Mr. Gill, and the other was left with Mr. Cutting, The following was a copy of Mr. Allen's certificate:—

"The sample contained about $1\frac{1}{2}$ per cent. of common salt. Common salt is often added to cayenne pepper to increase the brightness of the colour and to prevent it from fading in the light. The sample was also coloured with a small proportion of red ochre, or some similar ferruginous material. The above additions are not injurious to health. No other adulterations or admixtures were detected."

Mr. Allen having repeated the result of his analysis was cross-examined by Mr. Glaisyer.

What test did you apply in analysing the pepper?—I applied the microscope; and then burnt the pepper, and I saw from the ash that it was not pure.

What did you find?—I detected salt. The solution of the ash showed the presence of salt, and I detected the crystals through the microscope.

Might not those crystals have been chloride of potassium?—My test did not distinguish between chloride of sodium and chloride of potassium, but the latter does not so readily form into crystals.

You say you found red ochre in the pepper; what test did you apply for that?—I said I found red ochre or some similar ferruginous matter. The ash of the pepper was red, and cayenne does not burn red. I also found in the ash traces of oxide of iron.

In what proportion did you find the oxide of iron?—About ·1 per cent.

What, only 1 in 1000! Might not the presence of this minute particle of oxide of iron be due to the rust from the mill in grinding the pepper?—I scarcely think so; for then it would have been brown, and what I detected was red. There was some matter in the pepper foreign to its true condition; but I am not here to say how it got in.

Can you be certain whether it was chloride of sodium or chloride of potassium that was found in the pepper?—I would not be positive, but I adhere to the belief that it was chloride of sodium.

And as to the ochre, it might be oxide of iron or rust from iron in grinding?—It might be, but I do not think it was rust.

I will ask you one question more. From the result of your analysis would you have recommended a prosecution in this case?—I should not.

Mr. Glaisyer, addressing the Bench inquired if they considered it necessary to go on with the case. He had Professsor Attfield at his elbow and other witnesses and he was prepared to tender their evidence.

Mr. Smith said that after the admission made by Mr. Allen they could not do otherwise than dismiss the summons.

The Chairman having concurred, the summons was dismissed.

Mr. Glaisyer applied for costs, but his application was refused.

Mr. Francis Taylor, chemist, of Selby, was also summoned for selling as soda water, water aërated with carbonic acid gas containing no soda.

Mr. James Grayson, solicitor, of York, appeared for the defendant and urged that aërated water was well known to the public and constantly sold as soda water.

The Bench fined the defendant 2*s.* 6*d.* and costs.

Review.

ETUDES SUR LA BIÈRE, SES MALADIES, CAUSES QUI LES PROVOQUENT, PROCÉDÉ POUR LA RENDRE INALTÉRABLE, AVEC UNE THÉORIE NOUVELLE DE LA FERMENTATION. Par M. L. PASTEUR. Paris: Gauthier-Villars. 1876.

It is part of the creed of the average English beer-drinker, that the brewers of this country practise their art with an admitted superiority over the brewers of all other lands. Here and there one better informed might admit that something in the way of beer brewing was done in Germany, but the popular conception of the relation of Frenchmen to the calling is manifest in the partiality of the typical Gaul of the comic prints for English "*portaire*." Those who share this belief may be surprised to learn that the book which is the subject of this notice is the work of a Frenchman and is one of the most important that has yet been written on beer brewing, being one which by the scientific light it throws upon difficulties that have hitherto been dealt with empirically cannot fail to exercise eventually a wide-spread influence on brewing operations.

The readers of this Journal are not unacquainted with M. Pasteur's views on fermentation, and in March 1874 an account was given of the manner in which he proposed to practically apply his theories in the brewing of beer. In his new volume M. Pasteur has gone into the subject more fully, and considering its importance and interest it may be desirable to recapitulate here the principal points of M. Pasteur's arguments and observations.

It is practically admitted that there is a close connection between the keeping properties of beer wort and the finished beer and the processes adopted for their production. Thus after the wort has been boiled it remains sound whilst at a high temperature, but when the temperature falls below 70° C. it becomes liable to lactic and butyric fermentation, and between 25° and 35° C. especially so. Hence the practice of reducing the temperature of the wort as rapidly as possible by the use of ice and other means to a point where the wort is comparatively safe from alteration.

The changes that take place in beer are various; it may become tart, flat, putrid, ropy, or otherwise unfitted for drinking. Simultaneously with each of these changes there is a development of characteristic organisms and these, which are beautifully figured in the book, M. Pasteur holds to be the cause of the changes. In putrid beer the organism is a vibrio, but in the other commoner varieties of deteriorated beer the organisms, although differing in each case, have more or less a filamentary outline of less diameter and are very different from the spherical granules of true beer yeast. So uniformly is this the case that the author recommends the regular use of the microscope in a brewery, as the detection of these filamentary organisms may be taken as a sure sign of actual or impending deterioration of the liquor. For this reason he terms them *ferments de maladie.*

As to the source of these organisms of course, M. Pasteur will not admit their spontaneous generation, neither will he admit that they are modifications of a common organism brought about by the conditions in which they are placed. But he looks upon each as a separate vegetation, the germs of which have been deposited in the liquor, or on the apparatus from the atmosphere, or directly introduced as a contamination of the yeast. But although *ferments de maladie* are not transformed one into another through the conditions surrounding them, these conditions exercise a selective influence on their development. Thus the spores of mucedines, and the germs of bacteria, leptotrix, vibrios, etc., may fall simultaneously into an acid liquid, such as grape must, but whilst moulds would flourish there. bacteria and vibrios would be retarded in their growth if not killed by the acidity of the liquor.

If, however, the must were previously saturated with carbonate of lime, the opposite of these conditions would obtain; bacteria, lactic ferments and butyric vibrios would invade the liquor long before the moulds had time to establish themselves, their germination being very sluggish in an alkaline or neutral liquid. When once an infusion becomes covered with one vigorous growth it does not for the time readily support another, as all the available nutriment, and especially the oxygen, are seized by the first comer. But as the special nutriment of this growth becomes exhausted from the liquor its development gradually flags, until a point is reached when it may give way to the development of a hitherto dormant ferment more suitable to the altered condition of the liquid.

This selective action of liquids M. Pasteur turns to account in the cultivation of particular ferments in suitable media, where they will grow to the exclusion of the development of any other fungi with which the orignal spores may be mixed. But as long as there exists the smallest admixture of a foreign ferment there is a possibility under altered conditions of the admixture becoming the predominant growth. Thus, if beer yeast apparently pure, but containing the least trace of lactic ferment, be introduced into an alkaline mixture of milk and sugar, the fermentation that takes place is not the ordinary alcoholic fermentation but the lactic fermentation. In this way the author explains the hypothesis that has been put forward that one ferment is transformed into another by a variation of surrounding circumstances.

But although one of these fungoid growths is not transformed into another—as, for instance, the *Penicillium glaucum* or *Aspergillus glaucus* into beer yeast—some interesting facts were observed in the course of the investigation by which that result was established. When a mould that ordinarily vegetates in contact with atmospheric air, and draws from thence the oxygen necessary for its existence, is deprived of that source of supply, it may still continue to live, although with difficulty; but in this case the form of its sporic or mycelium development undergoes a change. Generally it may be stated that the tubes of the mycelium become shorter and thicker, approaching a globular form, and at the same time the plant shows a great tendency to act as an alcoholic ferment; that is to say, when plunged beneath the surface of a saccharine liquid it decomposes sugar with formation of carbonic anhydride, alcohol, and other undetermined substances, probably varying with the different moulds. The explanation given by Dr. Fitz, of Berlin, and endorsed by the author, is, that a fermentation fungus requires oxygen for its development; if it finds this in a free state it uses the oxygen in burning up a part of the sugar to assist it in assimilating another part; if there be no free oxygen the plant obtains from the sugar itself the oxygen it requires. This is in accord with what is observed in the development of even superficial beer yeast; for although it grows most luxuriantly when freely in contact with the air, it does not induce the formation of alcohol so rapidly as a less luxuriant growth submerged beneath the surface of the liquor.

It may be remarked that, whether right or wrong, the views propounded by the author are not mere speculations, but are inferences drawn from numberless experiments, many of which are described and beautifully illustrated in the volume, but cannot be more than alluded to here.

The chapter on the alcoholic ferments is intensely interesting and is almost bewildering in its suggestiveness. Take beer yeast, for instance. It is usual to speak of this as of two kinds—superficial yeast and bottom yeast; the former being almost exclusively used in this country and the latter on the continent. By some these two have been looked upon as two forms of one ferment, modified by its development, in the one case submerged in the liquor at the bottom of the vat, and in the other by its development at the surface of the liquor in the presence of atmospheric air. But M. Pasteur is evidently doubtful of this. In fact he quotes evidence to show that each may be a mixture of several distinct ferments. Thus, superficial yeast, obtained absolutely pure by cultivation, is killed by a temperature of 50° C., and is no longer capable of provoking fermentation. But one commercial sample of superficial yeast submitted to that temperature still remainedcapable of producing fermentation, due to the survival of a previously unnoticed form, to which in consequence of its physical appearance the name of *levûre caséeuse* has been given. This ferment was afterwards separated in the same way from other samples of superficial yeast, and further investigation and comparison led the author to believe that this hitherto unnoticed yeast plays an important *rôle* in some breweries, especially in the production of the famous pale ales manufactured at Burton-on-Trent by Messrs. Bass and Allsopp! Another superficial ferment accidentally met with was cultivated and yielded a beer unlike any at present known. Moreover all these forms can, by a special treatment, be made to undergo modifications; the products can in their turn be modified indefinitely; and each is said then to yield its special beer, the aroma of which in some cases is easily distinguishable.

It has been attributed to M. Pasteur that in his opposition to the theory of spontaneous generation, and also of the transmutation of species, he has accounted for the setting up of fermentation in fermentescible liquids, by supposing the air everywhere to be full of germs of all kinds of ferments, which are deposited on the surface of any such liquid whenever exposed. This, however, is not in accord with the result of M. Pasteur's experiments, for they went to show that although such germs do exist in suspension in the air, they are relatively few in number, except in localities where fermentation operations are carried on. The question therefore arises, whence do these remarkable bodies, such as the vinous ferment, take their origin? It has been found that the juice of a crushed grape does not ferment if it be preserved from contact with the powder occurring on the skin of the grape or on the wood of the vine; whilst the powder from a single cluster, or even a single grape, is sufficient to set a whole vat of juice into fermentation. This powder, collected by washing twelve grapes successively in 3 c.c. of water, was sufficient to render the water turbid, and when examined under the microscope was seen to consist of small organized bodies, associated occasionally with crystalline needles. A still larger relative quantity was obtained by washing the wood of the peduncle, and the washing of gooseberries, plums, peas, etc., gave similar results. The liquor so obtained when added to grape juice previously boiled, induced fermentation under conditions that led the author to the conclusion that the yeast cells have their origin in small brown organized bodies, which can be seen in great abundance by the aid of the microscope in the powder that covers the surface of fruits. Other experiments indicated that these bodies are only met with about the time of the maturity of the fruit, and that they disappear during the winter.

The foregoing may explain the origin of ferments which cause what may be called spontaneous fermentation, such as the fermentation of wine, where the process of crushing the grapes impregnates the juice with so many of these germs that it is left to ferment without further treatment. The case is different, however, with the fermentation of beer, where the material for inducing fermentation has to be added in the form of beer-yeast. Where the yeast for the first brewing came from, and whether it was superficial or bottom yeast, is an open question. As a matter of fact, beer wort abandoned to spontaneous fermentation may yield yeasts akin to that of the vine, but never the true beer yeast of either kind. Whether the ears of corn in its primeval wild form were covered by their appropriate organized pulverulent ferment, or whether beer yeast has been derived from another source and has become modified by prolonged cultivation in a particular manner, cannot now be decided.

Long as this notice has become only a few of the topics discussed in M. Pasteur's book have been alluded to. It will be seen, however, that it is not a book for criticism, the author's statements being supported by a plethora of experimental results that would have to be disproved before his inferences could be well impugned. The subject is one of extremely wide interest. The practical result of the author's researches, however, specially set forth in the present work is, that by the proper cultivation of beer yeast in suitable media, the so-called *ferments de maladie* can be eliminated, and with the pure yeast so obtained beer, or beers, can be prepared that will remain perfectly unalterable. How this is to be done is too long a story to be transferred to these pages, but must be read in M. Pasteur's handsome volume, which promises to inaugurate a new era in the history of beer brewing.

Obituary.

Notice has been received of the death of the following:—

On the 17th of September, 1877, Mr. Robert Hargreaves, Chemist and Druggist, Castle Street, Clitheroe. Aged 58 years.

On the 20th of October, 1877, Mr. Charles Tovey, Chemist and Druggist, Cairo. Mr. Tovey was pharmacist in the establishment of His Highness the Khedive of Egypt.

On the 2nd of November, 1877, Mr. William Charles Hayland, Chemist and Druggist, Ousegate, York. Aged 57 years. Mr. Hayland had been a member of the Pharmaceutical Society since 1869, and under a *nom de plume* frequently contributed to the Correspondence columns of this Journal.

On the 3rd of November, 1877, Mr. James Byron Burt Shenstone, Pharmaceutical Chemist, High Street, Colchester. Mr. Shenstone was a native of Bath and in 1839 was apprenticed to Mr. Smith of Colchester. After the expiry of his apprenticeship he was in business for several years at Wells, Norfolk, but in 1854 he entered into partnership with his former master, Mr. Smith, and since 1865 he has carried on the same business on his own account. Mr. Shenstone was Local Secretary of the Pharmaceutical Society, having been a member since 1853, and was the President of the Colchester Chemists' Association.

On the 5th of November, 1877, Mr. William Laird, Pharmaceutical Chemist, West Port, Dundee. Aged 52 years. Mr. Laird had been a member of the Pharmaceutical Society since 1853, and was an occasional contributor of papers to this Journal. He was also President of the Dundee Chemists' Association.

Dispensing Memoranda.

[21]. Apothecaries' or Avoirdupois?—It seems to me that Mr. Symes and P. B. are both very positive on this matter without any very good reason. In the P. L., 1851, we find the sign ℥ used to indicate one ounce of 480 grs.; and that being the latest authoritative interpretation of the sign I consider that it is still in force, and will continue so until altered by a competent authority.

The omission of any reference to it in the B. P. does not, I imagine, alter its value or prove that when used 437·5 grs. are intended. No one, I imagine, would dispense Liq. Sodæ Borac. ʒij, P. Sacch. ʒiv, Pot. Supertart. ℥j with 437·5 of Cr. Tart. and 120 and 240 grs. of the other two ingredients.

No doubt, if any one, customer or physician, sent to me for a number of articles, and wrote ℥j, ℥ij, ℥iv, and so on, I should supply the articles by avoirdupois weight, because that would be a commercial transaction; but when ℥j is written in a prescription I conceive it is used as a multiple of ʒj, and should be so interpreted.

Manchester. W. Wilkinson.

[21]. Apothecaries' *versus* Avoirdupois Weights.—I have often observed the conflicting opinions with regard to the correctness of dispensing with the apothecaries' weights when compounding medicines according to prescriptions, and attention having been recently called to the matter through the columns of the Journal, I venture to express my opinion on the subject, and, in doing so, I would unhesitatingly bear you out in the legitimacy of rendering the sign of "℥j" as equivalent to 480 grains. The following are some of my reasons for deciding in favour of your injunction:—

1. There is a wide difference between the buying or vending of drugs and the dispensing of medicines, although your correspondents seem to confuse the nature of simple purchase with the more difficult and important duty of dispensing with accuracy; so I hold that the comparison does not apply in this case.

2. The introduction of the avoirdupois system of weights into the Pharmacopœia in lieu of the other was (I fancy), more as a matter of convenience than necessity, so that large quantities of preparations (galenical or chemical) might be made by manufacturers without the trouble of converting the one scale into the other, since there are no large troy weights met with in commerce.

3. The physician knows the strength of such preparations (it being stated in the B. P. under each crude drug the number of grains the fluid ounce of its tincture is equal to), and prescribes accordingly, whereas when he orders solid ingredients he employs in preference the more readily divisible quantity, wishing the sign "℥j" to be understood as indicating the multiple of ʒj.

4. In selling over the counter we must conform to the established rule of selling by the avoirdupois ounce like other traders, when the price charged for the article bears a simple relation to its prime cost per pound. Further, customers want to know what weight they are getting.

5. It seems to me as clear as noonday that ℥j cannot possibly imply 437·5 grs., but an example or two will possibly afford better proof of the truth of my premises: (1) A physician orders a mixture containing Potass. Brom. ʒj, Aquam ad ℥viij, along with some adjunct dose ℥ss! Does he mean to give a dose of 27·33 grains, or does he intend ʒss to be administered periodically? Certainly the latter. In many instances the prescriber, after diagnosing the disease, ascertains the proper proportion to exhibit, and by simple calculation converts it into a multiple; at other times he specifies the quantity for one dose and adds "Mitte ℥viij." In the last case the dispenser would use troy weight, while in the former the majority would use avoirdupois weight, and, with the same original intention, the results would be different.

6. Another case in point, which has frequently come under my notice, is the following: ℞ Potass. Chlor. ℥j, divide in chart. viij. Sig.: One to be dissolved in a glassful of water and taken in three portions. Here, one scruple is meant to be given at a time.

7. Again, suppose we have an effervescing mixture prescribed with Potass. Bicarb. ℥ss in a twelve-ounce bottle, and, in conjunction with it, separate powders, each containing the requisite amount of citric acid to produce Pot. Cit. at the time of taking. In this instance there should be no dubiety as to what course to pursue; but those who fail to see the propriety of employing the troy weight would weigh the acid powders rightly, or according to the apothecaries' scale, and yet use another kind of weight for the alkali; hence the salts would not saturate each other as was intended. Such a mode of procedure is not only extremely inconsistent but, as I have endeavoured to show, unquestionably erroneous. Unfortunately there are many dispensers who rigidly adhere to the wrong way, which human nature appears almost persistently to follow.

"B. P." remarks that the troy weights ℥i, etc., are "practically obsolete;" this is not so, however, for they are used in many pharmacies throughout the kingdom (from ʒii to ℥viij, cup shaped). Of course, when the quantity is one ounce (*sic*) there need be no difficulty; or, again, if the drug or chemical be sent out in bulk, it is immaterial what weight is used (although it is better to employ the right one) so long as the dose remains the same; this is obvious, for, "as much as will lie on a shilling, etc.," may be taken from either 437½ or 480 grs., and practically there will be no difference in the absolute weight.

Another source of error, and one which is too prevalent, is the same confounding of weights in making solutions of salts for convenience in dispensing, *e.g.*, Chloral Hydrate one ounce, Water to two ounces; the solution is then labelled, and the strength marked as "one in one." I need not comment upon the blunder. I hope the time is not far distant when no ambiguity shall arise about the interpretation of signs, but that ℥j shall infallibly imply the recognized equivalent of 480 grs. I fear, under existing circumstances, it would not be policy to introduce the metrical system of weights and measures, as it would only cause more confusion and mistakes.

JAMES B. L. MACKAY.

Newcastle-on-Tyne.

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[27]. AQ. CAMPH. CONC.—During the discussion on the subject it has been repeatedly stated that Aq. Camph. contains ½ gr. camphor in each ℥j; this is not quite correct. Wishing some time ago to make an Aq. Camph. Conc., and not having the least idea to what extent camphor was soluble in water, I put a weighed lump in ℥xx of water and allowed it to remain seven days; at the end of that time I found it had lost 12½ grs., and therefore concluded the pint of water had dissolved that quantity, and calculated my Aq. Camph. Conc. accordingly.

℞ ʒj Camph., ℥iij Sp. Vin. Ten. ʒj of the above added to ℥iv of water forms a clear solution in the course of a short time, which contains 2½ grs. camphor in the ℥iv.

W. W.

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[27]. AQ. CAMPH. CONC., 1 to 7.—I have been in the habit of employing a solution of camphor in rectified spirit, *e.g.*:—

Camphoræ . . . . gr. xvj.
Sp. V. R. . . . . fl. ℥j.

This diluted with fl. ℥iij. of proof spirit will contain 4 grains of camphor in each fluid ounce, or ½ grain in each fluid drachm; fl. ʒj., therefore, of the diluted solution added to fl. ʒvij of water will form Aq. Camph., B. P., gr. ½ in each fluid ounce, perfectly clear. In cases where the employment of the diluted solution containing as it would a large proportion of spirit might interfere with the intentions of the prescriber, I employ the more concentrated, in the proportion of 15 minims to the fluid ounce, the proportions of camphor being equal, the spirit is reduced to a minimum. R. W. CARTER.

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[31]. To be of any service as an liniment the following are evidently the proportions intended by the prescriber.

Chloral Hydrate,
Camphoræ . . . . āā ʒj.
Glycerini ad . . . . ʒvj.

Just powder the camphor, using as usual a few drops S. V. R., then mix with chloral, and allow to stand in mortar until the mixture becomes liquid. Having poured this into bottle, add glyc. and shake.

W. F. TOCHER.

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[39]. Can any one suggest a method for mixing the following prescription, without separation taking place?—

℞ Tinct. Canthar.,
Liq. Ammon. Fort.,
Vaseline . . . . āā ℥ij
Aquæ . . . . ad ℥xxx.
Misce. Fiat Lotio.

F. H. B.

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[40]. Could some one inform me the best way of dispensing the following prescription, so as to make a good mass for rolling and for the pills to keep a uniform shape?—

℞ Ferri Redacti . . . . . gr. iij
Ext. Belladonnæ . . . . gr. ⅙
Bals. Peru . . . . . . ♏j
Ft. Pil. Mitte xij.

H. R. M.

Notes and Queries.

[556]. DRUG MILLS.—The Enterprize Manufacturing Co., Philadelphia, to whom I wrote for information about the American drug mill, informed me that Messrs. Kenrick and Sons of West Bromwich were manufacturing their American coffee, drug and spice mill here, and on application to Messrs. Kenrick, I was glad to find they had a supply on sale at their agent's, Mr. Geo. Burton, 232, St. John Street, E.C. Mr. Greenish and I have each had a No. 4a with enamelled and iron hopper, both of which work well. I tried mine with linseed; it ground it to a nice powder, but I think an hour on the treadmill would be gentle exercise compared with that of producing two pounds of linseed meal. It grinds most drugs which do not contain much resin or fixed oil sufficiently fine fine for percolation.

WM. MARTINDALE.

[561]. PULV. SULPH. ET POTASS. BITART.—Can any one give me the formula Pulv. Sulph. et Potass. Bitart? F. STEVENS.

[562]. BRILLIANTINE.—Will any correspondent oblige by giving a good formula for Brilliantine; one that will separate into two parts, each part remaining perfectly bright? "TOM."

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE PROPOSED ADMISSION OF WOMEN TO THE PHARMACEUTICAL SOCIETY.

Sir,—As many of the members of the Society, like myself, live in the provinces, and are generally unable to attend the annual meetings, it is well that such an important matter as has been lately referred by the Council to the decision of the coming conclave should be fully ventilated; and I can think of no likelier way than discussing it in your columns, if you will kindly grant the required space. The proposition may be briefly stated thus: Is the female sex a sufficient disqualification in an individual for admission within the borders of our Society? This question I, for one, venture to answer in the affirmative. What is the purpose in nature of the distinction of sex if there are not distinct duties and privileges belonging to each? The male is therefore generally formed of sterner stuff to fit him for his rougher work, but he looks to the female sex to provide for his welfare in the household duties and comforts of home. In consideration of her weaker frame, woman has always been allowed certain privileges among civilized nations, such as exemption from military service and other onerous duties, so that even as far back as the middle ages we find furious knights and proud cavaliers invariably respectful to ladies, so that the very word chivalrous was coined out of this circumstance. It becomes, then, a serious question whether we are prepared to see distinctions which have been kept up by a long period of natural selection ruthlessly overthrown and set aside, and woman lowered to the level of the arena of competition with man. If so, good-bye to all chivalry and every other privilege which the female sex has enjoyed, and let us have a fair fight and no favour. But this is impossible at present, as the traditions of centuries are not easily overthrown; and, meanwhile, ladies, by exercising their charms over examiners, will have an unfair advantage over gentlemen in the competition. If any one doubt this, let them compare the reports of the various teachers in a school of young ladies partly taught by masters and partly by mistresses, and they will find those of the former usually much more flattering than the latter.

But it may be urged that all this is not to the point, as our regulations already permit ladies to present themselves for examination. I am not about to discuss the wisdom or unwisdom of the present *régime*, but what I wish to impress upon those who are interested in the subject is the extreme folly of taking away any remaining barriers to the entry of a profession for which ladies are by their sex eminently disqualified. It was urged by Mr. Hampson, in his late speech at the Council board, as a special reason for electing two ladies as associates of the Society, that they had passed their examination with great credit; and our worthy President chimed in with the declaration that they were the highest on the list on the examination day; and at the end of the discussion it is worthy of note that the same gentleman appealed to Mr. Hampson, in a most pitiful strain, to spare him and some of his colleagues the alternative of having to violate their convictions or vote against the ladies. Well, all this proves my argument that there is likely to be an unfair bias in favour of the female sex.

The reasons why it seems to me we should do well to discourage the entrance of ladies into our profession are briefly these:—

1. It is an onerous business at best, with scant remuneration for the amount of time given to the accommodation of the public.
2. There is a considerable amount of drudgery connected with it, which must be repugnant to ladies, and which I should seriously be disposed to think their constitution would not be adapted to endure.
3. The market is already crowded; as you can go to very few towns but you will find druggists' establishments in far greater proportion than the wants of the population for their special commodities.
4. Though I can conceive that a young lady might perform the office of a dispenser pure and simple, yet there are many cases brought to the notice of an ordinary chemist which would be exceedingly undesirable to bring her in contact with; and hence the mixture of sexes in a pharmacy of the ordinary description would be an unmitigated evil.

For these reasons I must beg most respectfully to differ from the conclusion of Mr. Hampson, that "if any ladies did embark in the business of pharmacy the Council ought rather to hold out a hand to them than throw any obstacle in their way." I believe the only right way, and the kindest one in the long run, towards those who are taking a course which we believe to be adverse to their best interests, is to throw as many obstacles in their way as possible, and then if some still persist, why they must accept the consequences. But to throw the door of entrance into our Society open to all—indiscriminate of sex and other disqualifications—would, I believe, be a great mistake. It would be a direct invitation to ladies to come and compete with us, of which I fear that many would not be slow to avail themselves, and these would find themselves, when it was too late to withdraw, in a false position. As to the hardship of the fate of those unfortunate ladies who may seem really qualified to fill the arduous posts to which they aspire, I believe and trust they will always be exceptions, and must submit to the only sound policy in legislation—the greatest good to the greatest number; and whilst the dreadful doors of the examination rooms are not closed against them, they really have very little reasonable ground for dissatisfaction or complaint.

CHARLES FRYER.

12, *St. Nicholas Street, Scarborough,*
Nov. 12, 1877.

[*** We have received another letter on this subject from "*A Moral Pharmacist*," which like the foregoing travels beyond the record, and to a greater extent. We would remind our correspondents that the question to be brought before the annual general meeting is not whether women may practise pharmacy—that has been decided by Parliament—but, whether having become qualified and registered as pharmaceutical chemists or chemists and druggists, they should be elected as Members or Associates of the Pharmaceutical Society.—ED. PHARM. JOURN.]

THE SALE OF FOOD AND DRUGS ACT.

Sir,—Allow me to suggest that the results given in the report referred to are on too limited a basis to ground any opinion upon. What can be said about three draughts of one article, probably, or six of another. Supposing a person purchased laudanum at twenty places in any provincial town, what would be the proportion that would be equal to the B. P.; or, to take another example, vin. ipecacuan. or tinct. rhei co. Our trade or any other trade dealing in articles that come under the cognizance of the Act would act very foolishly were they to continue selling such articles as have been condemned under its operation.

All the rubbish that was formerly sold has had to be destroyed or sent abroad for the heathens. But the stomachs of Englishmen are relieved of the trouble of digesting plaster of paris, excepting when they take lac sulphuris.

ALPHA.

November 4, 1877.

The Poisonous Properties of Yew Leaves.

Sir,—During the discussion on "The Poisonous Properties of Yew Leaves," at the last evening meeting, the President expressed some doubt as to whether the common yew possessed equally poisonous properties with the Irish variety.

In 'Withering's British Plants' (1830), in addition to a reference to the case of three children being poisoned by a spoonful of the green leaves, although they had taken a similar quantity of the dried leaves on the previous day without effect, he states that "sheep and goats eat it; horses and cows refuse it (Linn.). . . But there are instances of both having been killed by eating it. . . Sheep are said to have been killed by browsing upon the bark. . . In August, 1822, Mr. E. Nicholls, of Ringmer, Sussex, turned a horse into a field in which there were some sprigs of yew tree, which had been clipped off in the course of the day. The horse ate of these afterwards drank at a pond and quickly died. In January, 1823, in a deep snow, Messrs. Woodward, of Chelmsford, in Kent, turned out three healthy horses into a small close, adjoining which was a yew tree. In three hours they were found dead with yew in their stomachs. It is believed to be equally fatal in sheep." The editor also states that "Four ounces of sweet oil, taken at two doses, in warm ale, and after that a pint of salt and water, have been found to relieve cattle thus poisoned." That, however, the leaves of the yew can be used in times of scarcity as a food for cattle, provided always that great care is taken with them, is evident from the following extract taken from 'Cattle; their Breeds, Management and Diseases,' by Youatt:

"The yew is probably the most destructive (vegetable) poison, especially when a quantity of it is taken unmixed with other food. M. Husard, however, relates that in Hanover and Hesse the cattle are partly fed on the leaves of the yew. He examined the trees as they grew on the mountains of those countries, and found them to be the tree yew. In winter, and especially when fodder is more than usually scarce, a portion of yew leaves and branches is mingled with the other food. The quantity of the yew is small at first, but it is gradually increased until it constitutes the greater part of the food; and it has the reputation of materially contributing to the fattening of the beast. The inhabitants of Hanover and Hesse are, nevertheless, perfectly aware of the poisonous property of the leaves of this tree, and are sometimes taught, by dear experience, that it will destroy their cattle, unless it is managed with this degree of caution.

"M. Husard adds, that on his return to France he determined to put this matter to the test, but he selected the horse instead of cattle as the subject of his experiment. He gave the yew mixed with oats in the proportion of half a pound of the former to a pound and a half of the latter, and the horse did not appear to be in the slightest degree inconvenienced by what he had eaten.

"This animal, however, was enfeebled and emaciated previous to the experiment; and it occurred to M. Husard that there might be a deficiency of sensibility in the stomach and in the frame generally, and that in consequence of this the poison might not produce its fatal effects: he, therefore, selected a mare in good health and condition as the subject of a second experiment. She ate the mingled yew and oats, and suffered no inconvenience.

"He selected another horse as the subject of a third and decisive experiment. He took seven ounces of the yew, and bruised and mixed it with twelve ounces of water, so as to make a kind of electuary, which he gave to a horse which had fasted for hours; an hour afterwards it fell and died."

Youatt, however, goes on to warn persons against using yew without the greatest caution, as he has himself known several instances to occur in which the presence of a considerable quantity of other food in the rumen has not preserved the beast from the fatal effects of the yew.

I am aware all the above cases possess veterinary rather than pharmaceutical interest, but I imagine it may be rather difficult to obtain information on the action of this plant when given to human subjects, and have therefore forwarded these extracts.

Yew leaves are stated to have the power of "stealing away life speedily, without raising convulsions or commotion" in the horse; and although, of course, very many drugs and herbs act in a totally different manner on human beings, I think it highly probable that in this case the action may be the same in both.

F. H. Storey.

W. F. F.—You will find many recipes for colours for show bottles in the recent volumes of this Journal; if you had specified the colours we would have provided a reference. Recipes may also be found in Cooley's 'Cyclopœdia,' or Beasley's 'Druggist's Receipt Book.'

"*Compositor.*"—We cannot say what kind of printing press would be "suitable for a country chemist;" so much would depend upon what he wanted to do with it. If you explained your want to Messrs. Ulmer and Co., printers' brokers, Farringdon Road, probably they would advise you.

Student.—Barber's 'Pocket Companion to the Pharmacopœia' is published by Philip and Son, Fleet Street.

C. Williams.—We cannot give you the information, but it could probably be obtained from a respectable scholastic agent.

E. Cardwell.—We differ from you as to there not being any foundation for the opinion expressed, which we still think was justified by the fact that the appeal to the employers was accompanied by a statement that the assistants were not themselves supporting the Association as might be expected. We do not think we can be fairly charged with acting adversely to the interests of the Association, its promoters having on several occasions been allowed to make known their projects in these columns, and we shall be happy to give the Association such further assistance as lies in our power, as soon as the signs of "life and good" of which you speak are more manifest.

W. J. Doe.—The strawberry tree, *Arbutus Unedo* (Ericaceæ).

E. Jerrett.—The explanation is to be found in the fact that the peas were dry.

J. C. Thresh.—(1) Microscopic drawings of the structure of capsicum fruit and seed are given by Hassal in his work on Food, and by Berg in the Anatomische Atlas. (2) We cannot.

Nemo.—Apply to the Registrar of the University of London.

A. H.—We do not known; consult a solicitor.

G. H.—The cause of the decomposition which takes place occasionally in mixtures containing subnitrate of bismuth and an alkaline carbonate, has been recently discussed in this Journal. See vol. vii., pp. 1053 and 1073, and present vol., p. 66.

A Subscriber (Ashton-under-Lyne).—The envelope was open and contained no sample when it arrived.

C. H. K.—Try solution of salicylic or carbolic acid.

W. S. Harris.—(1) The third edition of Bentley's 'Manual of Botany' was published in 1873. (2) The Pharmaceutical Latin Grammar is published by Groombridge and Co.

W. D.—We believe the article can be obtained from any manufacturing chemist.

W. V. Lewis.—A formula for Composition Powder was given in vol. vii., p. 308 (Oct. 7, 1876).

J. A. Floyd.—Your specimens consist of four fungi and one lichen. (1) *Corticum læve*; (2) *Stereum purpureum*, young state; (3) Too fragmentary to name; (4) *Nectria cinnabarina*; (5) *Physcia stellaris*.

R. S. T.—A separation of quinine sulphate in consequence of its slight solubility.

Inquirer.—See Mr. Warington's paper on "The Manufacture of Citric Acid," vol. vii., p. 767.

Communications, Letters, etc., have been received from Mr. Jackson, Mr. Brend, Mr. Maltby, Mr. Hurst, Chemist, A.P.S., D.D.

"THE MONTH."

In the country, bare trees, fallen leaves, and naked hedgerows meet the eye everywhere, and even the gardens present a desolate and bedraggled aspect, with little to brighten them except, perhaps, a few scattered chrysanthemums or a late blossom of the dahlia or African marigold. One extremely pretty object, however, may be seen occasionally in the hedgerows, which when seen is almost sure to be gathered for its beauty. This is the fruit of the spindle tree, of a most lovely rose-pink colour and coral-like appearance, and which splits open and discloses to view four seeds covered with a brilliant orange-coloured arillus. The leaves, flowers, and fruit of this shrub are commonly reported to be poisonous, but probably this idea is erroneous, since the wood has been used for skewers on account of its freedom from bitterness; the fruits also were found by Grundner to have only a diuretic effect. A bark of a nearly allied species, *Euonymus atropurpureus*, which from its equally bright coloured berries is known in the United States under the name of the "burning bush," is used as a tonic and diuretic in that country.

A very noticeable object in gardens at this time of year is the winter cherry, *Physalis alkekengi*. To botanists it is interesting as affording an example of an accrescent calyx. The calyx, at first green, and not by any means conspicuous, increases in size more rapidly than the fruit, so that by the time the fruit is mature the calyx, which is then of a bright orange-red colour, is several times larger than the globular fruit which it encloses. The fruit contains citric acid and a bitter principle, physalin, to which its properties are most likely due. The fruit is said to form a principal ingredient in a well-known nostrum for gout, and the leaves have been used in the south of Europe as a substitute for quinine. The bitter principle when dry has the curious property of becoming strongly electric when rubbed. Another species of the same genus, *Physalis viscosa*, is used in America as a diuretic in various urinary complaints. The winter cherry probably deserves more attention than it has hitherto received. The fruits of the winter cherry form one of the objects used for groups of skeleton leaves.

Few medicinal plants are as yet to be seen in blossom. At Kew, *Cinchona officinalis* is now coming into bud, and *Olea fragrans*, *Ricinus communis*, and a few varieties of tobacco and of orange are sparingly in flower, while different forms of *Capsicum annuum* relieve the mass of green foliage with their bright coloured and variously shaped fruits. The ripe capsules of the cotton plant are now in good condition for observation.

At the Edinburgh Botanical Gardens the cinnamon and contrayerva are in blossom, as well as the colchicum and the Christmas rose (*Helleborus niger*). *Cassia corymbosa*, also blossoming in the hothouses, affords an example of the structure of flower characterizing the sub-order Cæsalpiniæ of the Leguminosæ; and the curious arrangement of the stamens in different lengths, the porous anthers and the single gland at the base of the lowest pair of leaflets are worthy of notice. At the Regent's Park Gardens this plant has nearly ceased flowering, while the *Helleborus niger* has not yet made its appearance. *Helleborus fœtidus* is however now in flower in the open ground. The time of flowering seems to depend somewhat upon the time of year that the plants have been moved.

The November number of 'Medicinal Plants' contains figures of the following plants:—*Gynocardia odorata* (a double plate), *Galipea Cusparia*, *Arctostaphylos Uva-ursi*, *Solenostemma Argel*, *Capsicum annuum*, *Veronica virginica* and *Nectandra Rodiœi*. Of these plants *Nectandra Rodiœi* has not been previously figured; *Veronica*, better known as *Leptandra virginica*, only once before in an obscure work; and *Gynocardia odorata* only by Roxburgh.

Gynocardia odorata is official in the Indian Pharmacopœia as the plant yielding chaulmoogra oil, used in leprosy, and *Veronica virginica* in the United States Pharmacopœia as a stimulant in hepatic affections, while *Solenostemma Argel* owes its presence in the work solely to the fact of its being an adulteration of Alexandria senna.

The failure of ipecacuanha in India as a profitable crop, as reported by Dr. King of Calcutta, and the utter want of success with cinchona in Australia recorded by the director of the Botanical Gardens at Melbourne, in his recent report, are much to be deplored. It is always a wise policy not to be dependent upon one country for a supply of any drug, and it is to be hoped that an endeavour will now be made by the Government to introduce both these plants, not forgetting also the *Eucalyptus globulus*, into tropical Africa, in some parts of the region so recently laid open to English enterprise by the great American explorer, Stanley.

Every month seems to bring with it new remedies for trial, and while some few, like *Sophora speciosa* and curari, possess very powerful properties, many others are either almost inactive or require accident, as in the case of salicin, to discover their special properties. *A propos* of curari, which has long been known, comes its application to that frightful disease hydrophobia, of which both the medical journals and the daily papers are so full. Amidst all the talk of the learned and the twaddle of the ignorant, it is refreshing to find that some steps have been taken to investigate the true nature and treatment of the disease, for it is obvious that unless the seat of the disease and the structural lesions produced by it be discovered, it will be impossible to suggest a remedy, or to find one except by accident. The names of Dr. T. Lauder Brunton, F.R.S., Dr. J. Burdon Sanderson, F.R.S., Mr. Callender, F.R.S. and the energetic editor of the *British Medical Journal*, Mr. Ernest Hart, appear as members of the committee which has been appointed for this investigation. It is to be feared, however, that the best which can be done will only amount to a collation of the most carefully observed facts regarding cases of the disease. It will be many years hence before a definite knowledge of the causes and scientific treatment of this complaint can be attained.

Of course a number of methods for the treatment of hydrophobia have been already described. Thus the *Lancet*, of a recent date,* contains a note setting forth Buisson's treatment, which is as follows:—M. Buisson, of Paris, while attending a patient who was affected with hydrophobia, took the disease, and experienced its symptoms, such, for instance, as constriction of the pharyngeal muscles, and in despair of his life he determined to anticipate inevitable death by suicide. He therefore entered a Russian vapour bath at 107° F., when the symptoms subsided, and he in time completely recovered. He claims to have since then treated eighty cases of hydro-

* *Lancet*, Sept. 29.

phobia successfully in this way, supplementing the vapour bath by induced night perspiration and administration of decoction of sarsaparilla. The old journal from which this was extracted states that so convinced was M. Buisson of the efficacy of his treatment that he would allow himself to be innoculated with the virus.

Up to the present time curari, chloral and pilocarpine are the only new remedies suggested which present any chance of success in the treatment of this horrible disease. There is, however, one mode of treatment known to have proved successful, but which does not appear to have been recommended to any extent, probably on account of its requiring considerable courage, and that is the immediate excision with a sharp knife of the spot bitten, the subsequent bleeding tending to prevent the absorption of the virus, which lunar caustic or the actual cautery must tend to keep in the wound.

It is not a little instructive to outsiders to observe the difficulty that medical men have in coming to scientific conclusions from their results. Thus in one medical journal a case is given in which poisoning by ten grains of morphia was cured by the subcutaneous administration of sulphate of atropine and the internal use of tincture of belladonna, while in a contemporary almost of the same date another doctor gives his experience as tending to the conclusion that atropia "intensifies rather than counteracts the sedative effects of morphia."

There does not, however, appear to be any want of agreement among medical practitioners as to the opinion that chemists should never prescribe under any circumstances. Even in distant Chicago and still more distant New Zealand the same course is being pursued as in this country, and any case of injury arising from the careless prescribing of a chemist is eagerly pounced upon and held up to public gaze for the severest denunciation. In common fairness it might be demanded that accidents happening in the practice of medical men should receive equally rigorous advertisement and castigation, for the medical profession will scarcely lay claim to infallibity of judgment. Thus while the Weymouth chemist is made an object for caustic remarks, the apparent neglect of the use of antidotes in the case of the poisoning of Mr. Ellis, of Leicester, by prussic acid is allowed to pass without remark. Well known antidotes, such as the affusion of cold water on the spine and the administration of the hydrated peroxide of iron, do not seem to have been tried, or even recommended in this case, although there would appear from the newspaper reports to have been ample time for the use of the one first mentioned. A little more generosity is desirable on the part of those who hold up these incidents for public condemnation.

There are probably few chemists who could not call to mind cases in which had the prescriptions been dispensed as written disastrous consequences must inevitably have resulted, and in which the tact or presence of mind of the dispenser alone averted the suspicion of the patient. It is not improbable that if a well attested register of such cases were kept it would be found to quite counterbalance in point of numbers the cases in which dangerous or fatal results have attended the indiscretion of prescribing chemists. But it is to be hoped that it will never be necessary for dispensing chemists to keep such a record for self-defence or to rake up such cases for exposure to the reprobation of the public.

The *American Journal of Pharmacy* gives an interesting account, by Mr. E. G. Bissell, of hop-culture in New York, an amusing description of drug stores in the Far West, and a paper, by Mr. W. C. A. Busch, on the constituents of *Podophyllum peltatum*, in which he gives the amount of officially prepared resin soluble in ether as 60 per cent., a quantity which is intermediate between the amounts stated in different text-books. In spite of the numerous papers which have been published upon this drug, the numbers of active constituents and the proportions in which they exist in the rhizome have not yet been satisfactorily cleared up.

A new remedy, in the shape of a prophylactic against abortion, is being used in some of the United States. It consists of a fluid extract from the bark and young twigs of the black haw (*Viburnum prunifolium*, L.), given in doses of half to one drachm.

The Philadelphia College of Pharmacy is exhibiting considerable signs of vitality, and bids fair to make its museum excel that of our own Society. Having selected nearly two hundred drugs more or less used in the United States, and derived from plants indigeneous or naturalized in that country, but not found in Europe, for exhibition at the International Exposition at Paris next year, the committee propose further to send similar collections for the purpose of exchange to the various pharmaceutical institutions at London, Berlin, Vienna, Strassburg, Dorpat, Japan, and Mexico, and to enter into correspondence with well-known writers on medicinal plants at Rio Janeiro, Cairo, Athens, Bombay, Melbourne, and Buenos Ayres, with a view to obtaining from them collections of drugs indigenous in those countries. The growing desire to know more of the medicinal plants of all nations and to sift the good from the bad, is still further exemplified in the list of proposed additions to the next edition of the United States Pharmacopœia. With a liberality which is rare in this country, the work done by homœopaths is recognized in the proposed introduction of such drugs as *Calendula officinalis*, *Anemone pulsatilla*, *Thuja occidentalis* and *Hamamelis;* while old remedies such as *Rhamnus Frangula* and *Menyanthes trifoliata* are by no means despised because they had fallen for a time into desuetude. *Eucalyptus globulus*, *Eriodictyon Californicum*, *Grindelia robusta* and *Viburnum prunifolium* appear to be already sufficiently esteemed to deserve a place in the list.

Recent investigation and analysis seem to show that there are subjects close at hand waiting for some master-hand to clear up. No reliable test for quassia in beer, or for adulteration of balsam of copaiba, seems to have as yet presented itself.

An interesting paper will be found in the *Journal de Pharmacie*, upon the constituents of bitter almonds, in which the writer shows that even in the youngest state there is a chemical difference between the bitter and sweet varieties; and that while the emulsin appears in the embryo, the amygdalin localizes itself at first in the integument of the seed, and afterwards gradually penetrates the cotyledons through the radicle. Another paper in the same journal points out that a solution of pepsine in glycerine possesses greater digestive power than a solution in alcohol, and that the presence of more than 10 per cent. of alcohol in an aqueous solution of pepsine deteriorates its digestive power.

Pilocarpine seems likely to emulate, if not to supersede, calabar bean for contracting the pupil of the eye, it having been found to possess powers in this respect as active as those of eserine, while it does not excite irritation like that substance.

At the drug sales this month there have appeared, under the name of bush leaves or bush tea, from the Cape of Good Hope, the leaves of *Cyclopia latifolia*, DC., which have a rather pleasant flavour and a somewhat tea-like odour.

The leaves of another species, *C. Vogelii*, Harv., have been received from Port Elizabeth under the same name; both are used by the natives in the form of tea as a restorative drink. It is rather singular that the leaves of *C. latifolia* should form an article of import, since the plant is considered by botanists to be a rare species. Another species, *C. genistoides*, R. Br., with narrowly linear revolute leaves, is well-known at the Cape under the name of Honigthee, where it is used as an expectorant and tonic in catarrh, etc. The leaves of *C. Vogelii* are similar in shape to those of *C. latifolia*, but the latter has smooth leaves and the former minutely wrinkled leaves tapering towards the base. Both are easily distinguished by their elliptical outline from the leaves of *C. genistoides*. One or two cases of Caraccas sarsaparilla were also offered for sale this month. The bright pale brown colour and very thick root-bark of this kind and the absence of rootlets readily distinguish this variety, which is not of common occurrence.

London is scientific London once more; the November fogs have gathered round us; the scientific clubs and meeting-houses are full of activity; the lecture theatres are crowded with workers and students; and the learned societies are almost in full swing again. It is true that—contrary to anticipation—the advent of the fogs was not simultaneous with the enlivenment of Burlington House with the radiometer, but—in *Nature*—that instrument has served the same purpose and in a wider sphere. The lessons there taught are not merely scientific, but social. It appears that Dr. W. B. Carpenter wrote an article in the *Nineteenth Century* for April, on "The Radiometer and its Lessons," which in the opinion of Professor G. Carey Foster manifested an unmistakable tendency, whether intentional or unintentional, to depreciate the value of Mr. Crookes' discovery. This opinion was embodied in a communication made at the Plymouth meeting of the British Association, and in *Nature* of October 25, Dr. Carpenter defends himself against this charge of Professor Foster by professing the highest opinion of Mr. Crookes the physicist, but a very low opinion of Mr. Crookes the spiritualist, whilst incidentally he charges Mr. Crookes with having lent himself with facility to the support of wicked and mischievous frauds. He goes on to give the grounds for the charges brought against Mr. Crookes by himself, and seeks to substantiate the view that Mr. Crookes at an earlier period entertained erroneous ideas regarding the radiometer. Thus it is shown from Mr. Crookes' own papers that at one time he conceived the action to be at least mainly due to the impact of waves of light and that there was an evident inclination on the part of the discoverer to identify the cause of motion with a new force or mode of force. In reconciliation of the double mental state of Mr. Crookes, Dr. Carpenter says it is owing to an imperfect mental and bodily training, and he insists on the importance of a proper cultivation of the whole mind.

Of course Mr. Crookes replies to Dr. Carpenter in a subsequent number of *Nature*, and the discussion also entangles Professor Foster, Professor Osborne Reynolds, and Mr. Wallace, who is charged with an attempt to rehabilitate, in the July number of the *Quarterly Journal of Science*, the well known Odyle-doctrine of Reichenbach. Again and again the combatants return to the charge; Mr. Crookes becomes allotropic, being at one time Ortho-Crookes and at another time Pseudo-Crookes, and as others join in the fray "the damning with faint praise" intensifies and the *malus animus* emerges; men "have to choose between being fools and knaves," and altogether the quarrel is not pretty. It appears that Dr. Carpenter once addressed Mr. Crookes thus:—"Let us bury the hatchet; why should scientific men quarrel?" Why, indeed, should they? Whatever may be the explanation, it is to be feared that among scientific men there is more than enough of the Ishmaelite character.

Even chemists quarrel sometimes. For instance, J. H. van't Hoff recently wrote a *brochure* on "the Position of Atoms in Space," which Professor Kolbe has attacked* with zealous meaning. He writes "that trivial, fatuous, natural philosophy, with its profound intellectual air, which fifty years ago was thrown to one side by exact investigators, is at present rescued by pseudo-philosophers from the lumber room harbouring the hallucinations of the human mind, and the attempt is made to smuggle it—like a painted and bedizened courtezan—into society where it has no right."

To day the Institute of Chemistry of Great Britain and Ireland exists as a corporate body limited by guarantee under the 30 and 31 Vic., chap. 132, sec. 23. Its objects are as follows:—

(*a*) To promote and encourage a thorough study of chemistry and all branches of science allied thereto in their application to the arts, to agriculture, to public health, and to technical industry.

(*b*) To adopt such measures as may be necessary for the advancement of the profession of chemistry, and particularly for the maintenance of the profession of the consulting and analytical chemist on a sound and satisfactory basis.

(*c*) The doing of all such other lawful things as are incidental or conducive to the attainment of the above objects.

The members of the Institute comprise fellows and associates, for each of which classes a standard of proficiency and qualification is adopted, while the Institute is possessed of, and will exercise, where and if necessary, powers of censorship over alleged misconduct of the members and infringement of the regulations.

The *Analyst* was warned some time since that a certain sort of opposition to the incorporation of the Institute, with which it was acquainted, would be futile, and so it has proved. This excellent contemporary, however, although it has ceased to rail, still whines. The Institute is large enough for all who are qualified to become members thereof, and while it will embrace "the aspiring gentlemen of limited practice" to whom our excellent contemporary refers, it will also welcome those other gentlemen of unlimited practice if their fitness and qualifications prove not to be too limited. It is a day of

* *Journ. für. praktische Chemie*, Nos. 9 to 13, 1877.

conciliation and peace, therefore, and now that the turmoil of the waves has vanished it is to be hoped that the scientific barque will float more happily along its professional roads. It would not be matter of surprise if some day the world were to awake from its night's slumber and find on its breakfast table a work entiled, 'The Acts of the Analysts.' What stamping and raving, weeping and gnashing of teeth there would be! Pseudonyms protect the man who may dare to write that treatise! Let us hope that the chemical lion will lie down with the analytical lamb in the new sheepfold which is now provided for their common benefit. Leaving these altitudes with some regret, it is now necessary to recur to other matters of interest during the past month.

In a communication to the Akademie der Wissenschaften, Vienna, M. G. Ciamician details the results of some spectroscopic observations, from which he concludes, with Mr. Lockyer, that the spectra of compounds, as well as those of the first order of elements, consist exclusively of bands; and, further, that the bands are produced by molecules and the lines by free atoms.

The same chemist also submitted the results obtained in the distillation of resinous bodies with zinc dust. Abietic acid and colophony both yielded toluene, ethyl-methyl-benzine, naphthalene, ethyl-naphthalene, and methyl-anthracene; while gum benzoin gave rise to toluene, accompanied by smaller quantities of xylene, naphthalene, and methyl-naphthalene.

At the same time H. Skraup submitted a paper on "Cinchonine," in which he revives the old formula of Laurent, $C_{19}H_{22}N_2O$, and rejects the one now commonly adopted of $C_{20}H_{24}N_2O$, on the grounds that the former represents a number of carefully conducted analyses made by the author, and, further, because the amount of potassic permanganate required for oxidation into cinchotenin and formic acid is expressed in the equation—

$$C_{19}H_{22}N_2O + O_4 = C_{18}H_{20}N_2O_3 + CH_2O_2.$$

The author appears also to have obtained the base—hydrocinchonin $C_{19}H_{24}N_2O$.

Cazeneuve and Caillol* have extracted the piperine from various kinds of pepper by grinding these with twice their weight of slaked lime and a little water, then heating the mixture to boiling, filtering, and evaporating the extract to dryness. From the residues the piperine is extracted by ether, and on concentration the piperine is deposited from the ethereal solutions in large crystals of a light straw colour. It may be recrystallized from alcohol—

Sumatra Pepper gave	. 8·1	per cent.	Piperine.
Black Singapore ,,	. 7·15	,,	,,
White ,, ,,	. 9·15	,,	,,
Penang ,, ,,	. 5·24	,,	,,

M. J. Béchamp† has studied the action of some anhydrous organic acids upon anhydrous mineral bases by heating them in contact at about 130° for some few hours. Acetic, butyric, and caproic acids thus combine directly with bases, and when excess of the acids is used, the quantities of the obtained salts are almost theoretical in regard to lime when that is the base employed. Anhydrous acetic acid combines directly with anhydrous baryta at 100° C.; it also combines with the oxides of lead and mercury.

* *Bull. Soc. Chem.* (2), xxvii., 290.

† *Comptes Rendus*, No. 18, October 29, 1877.

M. Bussy had previously shown that sulphate of barium is produced when anhydrous sulphuric acid and anhydrous baryta are brought into contact, and several instances are known where anhydrous mineral acids form compounds with the anhydrous oxides of organic radicles—sulphate of methyl, for example. Moreover, compounds of anhydrous organic acids with such bases may be obtained, although with difficulty. The author regards these results as fully confirmative of the views held by Lavoisier regarding the acid nature of so-called anhydrides.

O. Loew* describes a number of additive compounds producible by the passage of cyanogen gas through albuminous solutions. He claims to have obtained compounds of $2\,CN\,3\,H_2O$; $4\,CN\,8\,H_2O$; $8\,CN\,16\,H_2O$, with albumin ($C_{72}H_{112}N_{18}SO_{22}$). These compounds give up part of their cyanogen to alkalies.

In an article on "Iridescent Glass," the *Chemical News*† states that the principle observed in its manufacture consists in submitting the glass articles to the action of dilute hydrochloric, sulphuric, or other acid, under a pressure of from two to six atmospheres. The inventor of the process is M. Clémandot, who claims to be able to imitate the nacreous films which are seen on ancient glass which has been exposed to combined atmospheric influences for thousands of years. It must be admitted that the articles fabricated by M. Clémandot's process are exceedingly beautiful and from their rapid appearance in shop windows may be deemed a success in spite of the high price asked for them.

Mr. G. E. Davies‡ has examined the various processes which have been suggested and used for the estimation of the available sulphur contained in the spent oxides of iron from gas works containing from 62 to 67 per cent. of free sulphur. After enumerating the various advantages and disadvantages of each of these, he describes experiments which show that the best method consists in drying at 100° C., and burning in a current of air; passing the sulphurous anhydride into a decinormal solution of iodine and titrating the excess of the latter reagent by standard solution of hyposulphite of sodium.

In this Journal for October 27, there appeared a note by Mr. J. B. Barnes, calling attention to the dangerous nature of an arsenical magenta-coloured paper used by pharmacists for capping purposes. Since then the arsenic contained in this paper has been estimated and it was found to amount to no less than 6·65 per cent. metallic arsenic, a fact which is not surprising in view of the statement made by Mr. Barnes, who says "the colour is evidently the product of the oxidation of aniline by arsenic acid." As Mr. Barnes has seen an improperly corked bottle coloured pink by its means dispensers will do well to avoid this paper, and also to cork their bottles better. The subject is, however, by no means new. Some time ago, in the *Archiv der Pharmacie*, there was a paper by Christel, on the red aniline glazed paper which he had examined, and he there gave the quantity of arsenic found in a ream of the paper. As a ready means for detecting its presence in a sample of paper, he recommends Reinsch's test. At the present time this subject deserves more than a passing notice, when certain public analysts—who whilst aiming at celebrity have attained notoriety—are busying them-

* *Journ. für. Praktische Chemie*, Nos. 9-13, 1877.

† November 16, p. 225.

‡ *Chemical News*, October 26, 1877.

selves in sniffing about chemists' shops, like the truffle-hunter's pig grubbing with his nose in any soil likely to yield him the much coveted fungus.

Professor Church* has also called attention to the presence of arsenic in coloured tapers, and from an estimation which he made of its amount, he concludes that they contain 1·48 per cent. reckoned as metal upon the original tapers. In this case the presence of the arsenic is readily revealed by the colour which it imparts to the flame in burning, as well as by the odour of the smoke when the flame is blown out.

Dr. Dupré has evidently been in a state of mental restraint for some time; at last when the internal pressure can be no longer supported he pours out his grievances to the *Analyst* in a lengthy epistle in which he covers ground ranging from castor-oil pills on the one hand, to the salt contained in Burton beer on the other hand. Intermediately he refers to preserved peas containing copper and confesses that he had hoped the authors of a paper which has been more than once mentioned in these columns would have withdrawn what, in his opinion (whatever that may be worth) constitute their hasty conclusions. Dr. Dupré commands our pity for his ill-cherished hope; those same authors may possibly entertain still more defined opinions regarding Dr. Dupré's hopes and prejudices. However, "it is never too late to mend;" and let us hope for the best.

The October number of the *Druggists' Circular* contained a remarkable article entitled "Glycerite of Kephaline," by Dr. Chas. G. Polk. Of this name he writes, "I employ (it) to designate a solution of cerebrates or brain hypophosphites;" he says further, "Cerebric acid may be obtained after Frémy's method. It will thus be seen that the glycerite of kephaline does not contain the phosphates or phosphites of the brain and is not identical in its constituents with protagon which embodies these."

Glycerite of kephaline exists only in the brain of Dr. C. G. Polk, and being an utterly abnormal constituent, in it is to be found the explanation of that learned gentleman's ignorance of the literature of brain chemistry, and his even more alarming original statements regarding that somewhat useful nervous tissue. May the shadow of glycerite of kephaline never grow less!

Writing of the brain calls to mind the physiological tables† just published by Dr. E. B. Aveling. He states that nervous tissue contains 15 per cent. of fats, which he classifies thus:—

$$\begin{matrix}\text{Fats 15 per cent. in white} \\ \text{5 per cent. in grey}\end{matrix} \begin{cases}\text{Oleophosphoric acid;} \\ \text{Olein; Margarin;} \\ \text{Palmitin; Cholesterine.}\end{cases}$$

Now the truth is (and it may surprise Dr. Aveling to learn it), that cholesterine is not a fat, and none of the other matters named occur in nervous tissue at all; oleophosphoric acid indeed has no existence.

Both Dr. Polk and Dr. Aveling may be set right by a short statement.

The phosphorized constituents of the brain are all derivatives of glycerine, and thus far they resemble fat, a resemblance which gains support from the fact that when decomposed they yield various fatty acids. In the case of one principle (lecithine), oleic and margaric or palmitic acids are thus obtained; in another stearic and a second unknown acid; in a third palmitic and a second unknown acid. But all are embraced in the following general formula:—

$$C_3H_9 \begin{cases}\text{HO substituted by fatty acid radicle.} \\ \text{HO} \quad ,, \quad ,, \quad ,, \\ \text{HO (OPO)}\ C_5H_{13}NO.\end{cases}$$

At the International Medical Congress recently held at Geneva, Professor Schiff, of that town, read an important paper* on the functions of the spleen, a subject which till then had received practically no explanation. The author found that extirpation of the spleen has no lasting influence upon the absolute or relative quantity of the white or red blood globules. During full stomachic digestion the spleen increases in volume from the fourth to the seventh hour, and during that digestion prepares for the same a ferment which enters the pancreas with the blood and transforms albumenoid substances there present into pancreatopepsine or trypsine. That this is so, seems more than probable, from the fact that after extirpation of the spleen the pancreatic juice loses its digestive power over albuminous matters while retaining other digestive properties.

Nitrate of pilocarpine (from jaborandi) is again receiving considerable study in the hands of medical men. Among others Dr. Dowse and Mr. Edes have found this agent to be possessed of considerable diaphoretic and sialogogue effects, when administered subcutaneously.

Mr. Alexander Morison, M.B., writing to a contemporary† calls attention to a case of chylous urine containing as he thinks sugar. In other respects the urine had the usual properties exhibited by the lixivium in such disorders; that is to say, it was milky from contained fatty matter in suspension and admitted of the isolation of this fat. Mr. Morison has not isolated his sugar, but considers this substance to be present, by reason of the chemical reactions he has obtained. When evaporated the urine deposited crystals which under the microscope looked like those of grape sugar; this appearance, however, does not go for much, as these crystals may have been composed of uric acid or its salts. Moreover, one might rather expect to find uncrystallizable glucose than crystallizable grape sugar, if sugar be present at all.

Now that the public have been awakened to the liability of infection being conveyed by water supplies, bad drains, tainted linen from the laundry, etc., another source of danger is pointed out,‡ and supported by a number of cases. The danger alluded to has its origin in the pawn-shops; infected articles are often left at these shops, and these contaminate other articles, which when redeemed, too often communicate small-pox or other disease to the owner, and hence the spread of disease is assisted. Those same pawnbrokers will, by and by, have to go in for ovens heated to such a temperature as may be deemed requisite for the destruction of the disease-matter, without harming the articles bearing it. In short, things are becoming decidedly hot for them.

The chemical waters are again troubled by analytical disturbances, and several journals have rather gone out of their way to describe the matter in question as "analytical discrepancies." This is scarcely a fair designation, as will be seen from the

* *Analyst*, November, 1877.

† 'Physiological Tables for the Use of Students.' Compiled by Edward B. Aveling, B.Sc., F.L.S. Hamilton, Adams and Co. London, 1877.

* *Gaz. Méd. de Paris*, Oct. 6.

† *British Med. Journ.*, Nov. 17, 1877.

‡ *Sanitary Record*, Nov. 16, 1877.

facts, which may be thus briefly set forth. Mr. Gatehouse found in a sample of Burton beer 68 grains of common salt to the gallon, while the report from the laboratory at Somerset House shows the presence of 66·5 grains to the gallon, but goes on to say that "the strong Burton beers contain about 60 grains of common salt per gallon, solely derived from the water, malt, and hops used." Now, as regards the analyses the discrepancy is not very dreadful, but objection may and has been taken against the additional statement which is quoted above. It is not probable that the water, malt, and hops would furnish so much salt, and this has been placed beyond doubt by subsequent work conducted by Mr. Gatehouse. The Licensing Act allows the presence of 50 grains of common salt to the gallon of beer, to cover the quantities introduced into beer from the sources stated; hence anything above that amount is fairly viewed as evidence of adulteration. The squabble to which allusion has been made would have been avoided had the Somerset House analysts restricted themselves to the bare analysis. It was an act of supererogation to make the additional statement which caused the grievance.

If analytical and consulting chemists generally, in giving certificates confined themselves more particularly to the facts of their investigations, and abstained from going into hypothetical reasons and expressing opinions of qualities and things, and instituting comparisons, such certificates would be less offensive to a healthy professional mind, and admit less of malconstruction or abuse.

Before proceeding to reply to dispensing queries, it may not be amiss, in reviewing the events of the past month, to direct attention to one or two subjects of interest to dispensing chemists. In last month's Journal a case is recorded of poisoning by eye water containing atropine, which had been given to a child in mistake for a mixture. At the inquest the mother stated that "she administered to deceased a dose from the lotion bottle believing it to be the mixture bottle, there being a similarity in the bottles," and that "the bottle was not labelled 'poison.'" Although the medicines in question were procured from a dispensary, the unfortunate circumstance brings into relief a very careless and objectionable practice which prevails in some establishments, that of using the same kind of bottle for both mixtures and external applications, relying only on the difference of label. Probably to this cannot be added the habit of sending out bottles without labels, but very commonly labels are not sufficiently distinctive for external medicines; there should be no exception to the use of the blue "poison bottles" for all external applications, and when these bottles are used the label should be in red type, or a red ground with black type; the public would then learn gradually to associate the red label with the danger signal. In addition to this a red slip label, "liniment," "embrocation," or whatever the contents of the bottle may be, should be pasted over the cork or cap, and finally all blue bottles should be sent out wrapped in paper of a different colour to that of those containing mixtures for internal administration. Careful habits on the part of the dispenser are appreciated by the public and become remunerative; they serve also to distinguish between a pharmacy and those other places called "open shops." In the case above quoted, the jury were of opinion that carelessness was shown by the dispenser in not affixing to the bottle a label with *poison* written or printed upon it, and that the bottle was not a proper one for a small quantity of lotion as prescribed.

The discussion that has been provoked by an opinion expressed in these columns last month respecting the use of the ℥ sign discloses a diversity of practice that was hardly to be suspected. At present it would be premature to treat the discussion as at an end, and before it does close it would be very interesting to have an expression of opinion from one or more members of the Pharmacopœia Committee, as to what was the meaning intended to be conveyed by the passage in the Preface to the British Pharmacopœia that has been quoted as decisive on both sides of the argument.

And now to deal with the "Memoranda," according to their consecutive numbers.

No. 29. A formula is required for Tinct. chinæ nit. This is evidently a preparation of China nit. or *Cinchona nitida*, one of the South American quill barks usually imported from Huanuco. The bark is figured by Howard and also by Berg, but it is evident from the figures differing that they had not before them the same kind of bark. As there is no formula for a tincture of this bark it might be made as Tr. cinchon., B. P. If convenient, it would be well to refer to the writer as the bark is rarely found in commerce.

No. 30. The doses of hyd. bichlor., ergotine and ext. bellad., as combined in this prescription are those commonly prescribed, and there is no difficulty in making a satisfactory pill by first evaporating the ergotine to a pilular consistence. A pill with ergotine in its composition should be sent out in a bottle, as it readily absorbs moisture. Under the same number there is a prescription ordering pepsina porci, acid. carbolic., etc. A very satisfactory mass may be obtained by using the carbolic acid in crystal and adding from one-half to two-thirds of a grain of bread crumb to each pill. The mass should be well kneaded and the pills quickly rolled out, when they may easily be silvered. Bread crumb is a good excipient when there is more moisture prescribed than is convenient.

No. 31. This formula of chloral hydrate and camphor is most probably an error of the writer, and was intended to be either ʒj of camphor or ℥j of chloral hydrate. Equal proportions of pulv. camph., and chloral hydrate after being mixed a short time liquefy, and to this product may be added any quantity of glycerine. The mixture made according to the formula in question leaves a large portion of the camphor undissolved, and is not a presentable compound. If the inquirer is a reader of pharmaceutical literature he must have observed frequent reference in this Journal to a mixture of equal parts of camphor and chloral hydrate becoming liquid, and also to the value of the mixture as an external application in some forms of neuralgia.

No. 32. Lin. saponis, B. P., made with sapo animalis becomes solid. Sapo animalis is a soda soap made with purified animal fat, consisting principally of stearin, and this forms a stearate of soda, nearly insoluble in spirit, whereas Sapo durus, B. P., is made with olive oil and soda and forms an oleate of soda, soluble in rectified spirit. Sapo animalis cannot be substituted for sapo durus in the lin. saponis, B. P., or where a fluid preparation is required, but is well adapted for a solid preparation.

No. 33. An ℥viij mixture containing ℨiij sp. camph. This quantity of sp. camph. is equivalent to eighteen grains camphor, which is more than the fluid will take up ; it cannot be made a clear mixture, and should not be filtered. It is not unusual for medical men to order such a quantity of sp. camph. in a mixture of this size, and as the dose is not mentioned, it is difficult to determine the intention of the prescriber in this case.

No. 34 is a pill containing hyd. bichlor. gr. ij., with the same quantity of ext. opii in each pill. There is evidently a mistake of the writer of this prescription ; it is the proportion usual for about thirty pills. The inquirer has made no observation on the excessive dose. Had he been passing his Minor, and overlooked the evident error, the chances are that he would have been "spun" for it.

No. 35. The inquiry is whether where ferri cit. is ordered in a prescription ferri am. cit. should be used? It would be justifiable. Ferri am. cit. is a recognized preparation, and is not unfrequently written ferri cit. when ferri am. cit. is evidently intended.

No. 36 is the old and well-known Locock's lotion formula with perhaps a very slight variation. It may be made by melting together the mace and olive oils, pouring the product into a mortar, and then emulsifying it with the ammonia, adding gradually the water, and finally the spirit of rosemary. But a better result is obtained by rubbing up the oil of mace with the ammonia and oil alternately, then adding the water, and finally the spirit of rosmary. In either case there will after some time be a certain amount of separation.

No. 37. Aluminæ sulph. being ordered in a prescription, the question is, should the double sulphate of the B. P. be used? It is probable that the double sulphate was intended, but as the aluminæ sulph. is known in commerce, it would be better when practicable to refer to the writer. If that cannot be done the dispenser must rely on his own judgment. A knowledge of the prescriber's habit of writing his prescriptions will sometimes materially assist the dispenser.

No. 38. In this instance, the same rule will apply as in the preceding, No. 36. The addition of spirit to this and other similar emulsions will cause more or less separation; and the amount of separation and the time at which it occurs will mainly depend on the relative proportion of the spirit to the water.

No 39. This prescription cannot be mixed without separation. The best method, but one that would require the sanction of the writer, would be to add a quantity of sapo mollis, B. P., about equal to that of vaseline, rub them together, then add the ammonia, afterwards the water, and lastly, the tincture. Even then a certain amount of separation will take place. Vaseline is a substance of indefinite composition, and the usual rules will not apply here.

No. 40 is a pill containing bals. peru with other ingredients. It may be satisfactorily made by the use of a little bread crumb, as in the preceding prescription, No. 30.

Correspondents who have communicated formulæ for aq. camph. conc. may be reminded that a concentrated preparation was required that when diluted one part to seven of water should represent aq. camph., B. P., which contains on an average half a grain of camphor in the ounce. Any formulæ that would make a camphor water stronger than the official form would not be admissible, and the same may be said with regard to the addition of tr. myrrh. said to promote the solubility of the camphor.

LABORATORY NOTES ON QUININE. *

BY ALBERT B. PRESCOTT.

I. *Solubility of Quinia Precipitate in Water-washing.*—On precipitating quinia sulphate acidulate solution with sodium or with ammonium hydrate, and washing on the filter with water until the washings gave no cloudiness with solution of barium salt, Mr. W. J. Holloway found a loss of 11·6 per cent. of the quinia. The weight of quinia sulphate taken was 0·250 gram, two operations, one with each alkali, giving the same result. Two other operations were made, the precipitates respectively by sodium hydrate and by ammonium hydrate being set aside for twenty hours before filtering, and then each washed with 18·4 c.c. of water. The precipitate by soda had wasted 2·9 per cent. of the alkaloid, that by ammonia 10·6 per cent. The filtrate from one of the precipitates by ammonia (added in very slight excess) was made turbid by adding soda, and the dilute washings of this same precipitate were made turbid by ammonia (though the first filtrate was not so affected). Apparently the solvent power of water upon the alkaloid was diminished by presence of a very small proportion of ammonia, though it is increased, as is well known, by presence of more ammonia. A change in the proportion of the same solvent reverses its effect, just as dilute sulphuric acid dissolves less lead sulphate than either water or concentrated sulphuric acid.

Mr. A. S. Lobb washed 0·280 gram of dried quinia on the filter with a half liter of water, dropped from a burette, at about 87° F., and found the alkaloid had lost 50 per cent. of its weight, each c.c. of the water having dissolved 0·000216 gram of quinia. In all these cases the filtrates gave a precipitate with potassium mercuric iodide.

The solubility of quinia precipitate in sodium sulphate solution becomes of interest, because this solution is the filtrate, in the use of the best precipitant, with the common salt of the alkaloid. From an experiment by Mr. Lobb it appears that solution of sodium sulphate has practically neither more nor less solvent power than pure water. A precipitate of 0·280 gram of the alkaloid was washed with 500 c.c. of a half-saturated solution of sodium sulphate, dropped from a burette on the filter during $2\frac{1}{2}$ hours, and then washed with pure water (214 c.c.) until free from sulphate, when 0·1375 gram of alkaloid remained. Therefore, of the 714 c.c. of sodium sulphate solution and pure water, averaged together, each c.c. dissolved 0·0002 gram of alkaloid, a result practically the same as the 0·000216 gram dissolved by a c.c. of pure water.

Of course, solubility in washing precipitates must fall below *solubility of saturation.* The latter is given for quinia, at 1667 parts of water of 68° F. (Sestini), in which proportion 1 c.c. of water dissolves 0·0006 gram of the alkaloid, nearly. J. Regnault found 2024 parts of water at 15° C. to dissolve one part of pure quinia.

Evidently, the precipitation of quinia as a free alkaloid is inaccurate in quantitative work, under any circumstances, and, if there is much dissolved matter in the filtrate to be washed away, the operation gives no result of even approximate quantity. By measuring the filtrate with the washings, some notion of the loss may be gained, but this loss is varied by proportion of the precipitant, and may be varied by other dissolved bodies in the filtrate. Moreover, the precipitation of quinia by alkali,

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* From the *American Journal of Pharmacy* for October, 1877.

in the preparation of citrate of iron and quinia, is wasteful and inaccurate.

II. *Gravimetric Determination of Quinia, as a Precipitate by Potassium Mercuric Iodide.*—The value of this precipitate, washed and dried at 212° F., was found to be 2·900 grams for 1 gram of quinia, dried at the same temperature. This finding was the mean of three determinations, using Mayer's solution upon an acidulated sulphate solution of alkaloid, the results being respectively 0·801, 0·824, and 0·812 of precipitate from 0·280 of alkaloid. Just 26 c.c. of Mayer's solution were required for the full precipitation of each portion $(26 \times 0{\cdot}0108 = 0{\cdot}2808)$, after which 4 c.c. of the standard solution were added in each portion, to represent an excess of the reagent, as convenient in a gravimetric operation. The quinia taken was Powers and Weightman's "pure quinia," which was found to lose 6⅝ per cent. at 212° F., so 0·300 gram was weighed in each portion to represent the 0·280 gram as dried at 212° F. The volume of Mayer's solution required for each, as given above, very nearly coincides with 0·280 of Mayer's quinia. Farther investigation is desirable as to presence and proportion of combined water in the residue of quinia at 212° F. Mr. A. H. Allen* has reported the residue from ether solution to retain constant, at 212° F., 4·28 per cent. of combined water, a little less than that of a monohydrate. From this report Mr. A. N. Palmer† dissents, stating that a residue of constant weight can only be obtained at 260° to 270° F. See IV.

The precipitate by potassium mercuric iodide is very close, and bears water washing without weighable loss. The reagent need not be of standard strength for gravimetric results; it can be prepared simply by treating solution of corrosive chloride of mercury with solution of iodide of potassium until the precipitate at first formed is just all dissolved. (For the execution of the determinations given in this note I am indebted to Messrs. J. J. Johnston and A. S. Lobb.)

III. *Gravimetric Determination of Quinia as a Precipitate by Phosphomolybdate.*—This precipitate is exceedingly close in the case of quinia, and bears washing without loss, but does not bear a temperature above 158° F. (70° C.) without reduction of molybdenum, shown by a blue colour. The value of the precipitate, dried below 158° F. to a constant weight, was found by Mr. Lobb to be 3·665 grams for 1 gram of quinia as dried at 212° F. This result was the mean of two nearly identical determinations, 0·280 gram of the alkaloid giving respectively 1·026 and 1·0265 gram precipitate. The reagent, the acidulate solution of sodium phosphomolybdate, is added in slight excess, when the precipitate separates admirably.

IV. *Solubility of Quinia Precipitate in Washed Ether.*—This was found by Mr. Lobb to be 20 parts of the ether for 1 part of quinia (monohydrate), after twenty-four hours' digestion in a stoppered jar. A portion of the saturated ether solution was drawn into a specific gravity bottle and its weight obtained, then poured, with the ether rinsing, into a thin glass evaporating dish (tared), the ether evaporated, the residue dried at 212° F. A constant weight was believed to be obtained, notwithstanding the difficulty of gain by hygroscopic water while weighing. The last four weighings were, for dish and contents, 26·895, 26·894, 26·893, 26·895. (See reference to Mr. Palmer in Note II.) The residue of quinia from ether solution is amorphous and does not yield a perfectly crystallizable sulphate. Taking this residue as a monohydrate, nearly 21 parts of the *washed ether* are required to dissolve a precipitate of quinia containing 1 part of anhydrous alkaloid.

The solubility of quinia in *ether* is given by van der Burg at 23 parts (ether of sp. gr. 0·72 and 18° C.), by Merck at 60 parts, Flückiger and Hanbury 21 parts, by Hesse—for quinia trihydrate—at about an equal weight of ether, by J. Regnault at 22·6 parts (15° C.).

V. *Valuation of Six Samples of the Citrate of Iron and Quinia in the Trade.*—The samples were obtained indiscriminately from different dispensing drug stores in Michigan. Only *the total alkaloid* was determined. This was done by extraction with chloroform, as follows: a weighed portion of the scales was dissolved in water in a wide tube with a stopper, a small amount of tartaric acid was added (to prevent precipitation of ferric hydrate, a hindrance to the separation of chloroform), solution of sodium hydrate was added to alkaline reaction, and the liquid repeatedly shaken with successive portions of chloroform, the chloroform being drawn off into a weighed beaker and evaporated until a portion of the chloroform caused less than one milligram increase of weight to the beaker. The total residue in the beaker was now dissolved in water acidulated with sulphuric acid, the solution treated with a slight excess of sodium hydrate solution, then extracted with successive portions of chloroform, as before, and the residue from this solution was dried at 212° F. to a constant weight. This residue is given as the alkaloid, containing, according to Allen, 4·28 per cent. water. The determinations were done by W. J. Holloway, in June, 1876, with the following results:—The samples gave

5·2 12·2 8·7 9·0 11·4 8·3 per cent. of alkaloid.

VI. *The Presence of Sulphates in Citrate of Iron and Quinia.*—In each of the six samples, numbered above, Mr. Holloway found sulphates present. In three of them the quantities of sulphuric anhydride were found to be less than 1 per cent. of the preparations; in the other three the quantities were found to be respectively 6·5 3·5, and 1·8 per cent. of the preparations. A sample of citrate of iron and ammonium, from the same manufacturer who furnished the sample of quinia iron citrate which had the 6·5 per cent of sulphuric anhydride (above given), was found to contain 4·9 per cent. of sulphuric anhydride. A few ounces of solution of tersulphate of iron were precipitated by ammonia water, and the precipitate washed "with water until the washings are nearly tasteless," as the Pharmacopœia directs in the preparation of solution of citrate of iron, from which the three scale iron citrates are made. In this washed ferric hydrate, sulphate was found present, amounting, as sulphuric anhydride, to 14·8 per cent. of the drained moist precipitate. A sample of citrate of iron and quinia was made by the pharmacopœial process, except that the quinia sulphate was added, as such, without precipitating the alkaloid, and the scales were found to contain 4·3 per cent. of sulphuric anhydride. By calculation (if I am correct) all the sulphuric anhydride of the quinia sulphate cannot form over 1·8 per cent. of the scales of quinia iron citrate. If 10 per cent. of water be assumed in the scales, their per cent. of sulphuric anhydride would be about 1·6. It will be remembered that the British Pharmacopœia, for preparation of the iron citrates, directs to "wash the precipitate (ferric hydrate) with distilled water until that which passes through the filter ceases to give a precipitate with chloride of barium." Such is the well-known adhesion of ferric hydrate for alkali salts, that to wholly remove them requires persistence and wash-water, in a sufficient quantity of each; but it is farcical to wash away the sulphate from the quinia, wasting from 2 to 11 per cent. of the alkaloid and making the preparation uncertain in strength within the same limits, while taking a greater quantity of sulphate in the hydrated oxide of iron. Of course, after the solution takes place, any quantity of combined sulphuric acid present, if derived from the iron precipitate, will be *just as much* in combination with the quinia as though it had been introduced in quinia salt.

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* *Pharm. Journ and Trans.*, vi., 964, June 3, 1876.
† *Ibid.*, vii., 89, July 29, 1876.

The Pharmaceutical Journal.

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THE COMMERCIAL HISTORY OF A CINCHONA PLANTATION.

Now that the cultivation of cinchona trees in other countries than those where they are indigenous is likely to become more general, some information in reference to a variety of cinchona yielding bark that contains from 6 to 9 or 10, and even 13 per cent. of quinine, will not be without interest. The variety to which we refer is that known as *Cinchona Calisaya Ledgeriana*, which has been cultivated with success in Java, and to some extent also in British India.

The seeds with which these experiments have been made were obtained by Mr. C. LEDGER, through the medium of a native of Peru, named MANUEL, who travelled with him between the years 1841 and 1858. This man had been a collector of cinchona bark, and had the repute of being intimately acquainted with the value of the different kinds, and notwithstanding the obstacles thrown in the way of obtaining cinchona plants or seeds by the Peruvian authorities, MANUEL undertook to obtain for Mr. LEDGER a quantity of seeds of the best kind. Early in the year 1865, Mr. LEDGER returned to Peru, and some months afterwards MANUEL hearing of his return brought him a quantity of seeds which he had collected in the Bolivian province of Caupolican. These seeds were sent from Arica to England and placed in the hands of Mr. GEORGE LEDGER for disposal. The original intention was to offer them to Sir WILLIAM HOOKER, but in consequence of his death about that time, this project was not carried out. Sir JOSEPH (then Dr.) HOOKER was absent through ill health, and Mr. MARKHAM had shortly before left for India, so that Mr. LEDGER was in some difficulty as to the disposal of the seeds, and fearing that if kept they might spoil he offered a portion of them to the Dutch Government. Upon the recommendation of Professor MIQUEL, LEDGER's offer was accepted and he received as a preliminary payment a sum of about £8 10*s.*, under the condition that he should receive further remuneration if it should turn out that the seeds arrived in Java in a condition capable of growth and that the plants belonged to a good variety. In 1866 VAN GORKOM reported that from these seeds about 20,000 plants had been raised, and a further sum of about £42 10*s.* was then paid to Mr. LEDGER. The rest of the seeds were purchased by Mr. MONEY, on the recommendation of Mr. J. E. HOWARD, and sent to India.

At first the plants grown in Java were considered to be but slightly different from the *Cinchona Calisaya* already in cultivation there, but fortunately the new plants were kept separate. The plantations situated chiefly at Tjiniruan suffered considerably from sickliness, which hindered the growth of the trees without killing them entirely. A small quantity of the bark was collected in 1872 amounting to about 500 lbs., and samples were sent for analysis to Mr. MOENS, who soon found that it was very rich in quinine. Further samples were collected from other plantations in order to test the accuracy of the result obtained, and from their examination it was established to a certainty that the Javan plantations contained a variety of cinchona yielding bark that contained twice as much quinine as the best kinds of American bark. This result was still further confirmed by the sale of the 500 lbs., which took in May, 1873, at Amsterdam, when it fetched the price of 7*s.* 9*d.* per lb., or twice as as much as that of Bolivian calisaya. As a natural result of this experience special care was directed to the cultivation of this tree. Originally the trees had been too thickly planted; they were thinned by removing or cutting down some of them, and in this way a quantity of bark was obtained annually, amounting up to the end of 1876 to about 16,000 lbs. The extent of the plantations where these trees were grown is 59½ square roods, but some portions of it are still occupied by forest trees that have been cut down to make room for the plantation, so that the extent of cultivated ground is less than the area given. The cost of clearing the land and planting 7 roods of each is estimated at £12 10*s.* The cultivation and supervision, including various other expenses amounted to £3 6*s.* 8*d* per 7 roods, and according to a report recently published by Mr. MOENS, the nett profit arising from the above-mentioned area amounted at the end of 1876 to £4070 10*s.* In the year 1874 not only had the expenses of the plantation, commenced in the year 1866, been covered, but there was even then a profit of more than 100 per cent. upon the whole capital sunk in the undertaking, and the nett profit of the eleventh year amounted to about £479 per 7 roods.

But these facts do not complete the history of the plantations. There still remain 3320 the original trees and 4085 living stumps, from many of which new stems have grown up from 6 to 10 feet high. Amongst these trees are some that would yield more than 20 lbs. of bark if they were cut down at the present time, and Mr. MOENS estimates that if the whole of the plantations, including the roots and stems, were to be cleared they would yield about 16,000 lbs. of bark, which would have a value of £4600. Consequently it would have been possible at the end of 1876, or ten years after the trees were planted out, to have realized from this piece of ground a profit of upwards of £8000.

These calculations were made by Mr. MOENS a a time when he was unacquainted with the recent high price of cinchona bark, amounting to about 50 per cent. in excess of that which he has adopted in his calculations, so that really a very much more favourable result might have been obtained if the sale of bark had taken place so as to share in the rise in price since the last sales.

According to the account given by Mr. MOENS, cultivation and the use of manure have had the effect of increasing to a very considerable extent the amount of quinine. Referring to the fear entertained in British India that the attempt to cultivate *Cinchona Calisaya* from seeds would not be successful, on account of the possibility that the plants might deteriorate, Mr. MOENS expresses the opinion that this would be equivalent to abandoning the cultivation, since the cultivation from cuttings is so difficult in the case of *Cinchona Calisaya* generally, and especially of the variety *Ledgeriana*. He considers this fear to be exaggerated, for although there always are among the seedlings from one and the same tree some which are distinguished by the peculiar form or colour of the leaves, still the greater number of of them resemble the mother plant, a circumstance which obtains also with *Cinchona officinalis*, and to a less extent with *Cinchona succirubra*. Experience, however, has shown that both these plants, as compared with the American mother plants, are as a rule rather richer in alkaloids than poorer. The trees of these varieties in Java are again seedlings from British Indian plants, and it is beyond doubt that the bark obtained from them in Java is not poorer in alkaloids than that from the mother plant in Ceylon and Madras. The plants raised from seeds of *Ledgeriana* vary amongst themselves considerably in the form of the leaf and even in the colour and shape of the flowers and fruit, but nevertheless they all yield bark which is very rich in quinine. Guided by the experience of several years Mr. MOENS expresses the opinion that the average amount of quinine in the bark from trees raised from seeds of *Cinchona Ledgeriana* will be found to correspond with the amount existing in the mother plants; and that although in such a plantation there may be some trees yielding poorer bark, there would also be as many that would yield much richer bark than that of the mother plant. He is therefore of opinion that there is no reason to fear that the contents of alkaloid will either diminish or deteriorate.

In reference to the facts above stated we cannot do better than reproduce the following passage from one of the papers on cinchona cultivation by Mr. JOHN ELIOT HOWARD: "My advice to all cultivators of cinchona bark is to plant none but the very best species, and to go in for high cultivation. In so doing they will be quite independent of all courtly favour and of all foreign competition. Success must be won by strenuous persevering exertion, for (as SCHILLER says of the flowers of German poetry), the cinchona blossoms 'do not expand under the sunshine of princely favour.'" It would seem that Mr. MOENS has given a practical exemplification of the value of this precept.

CHEMISTS ASSISTANTS' ASSOCIATION.

WE are glad to learn that the Chemists' Assistants' Association, in reference to which some correspondence has lately appeared in the Journal, is beginning to manifest some sign of vitality. From a notice which appears in this week's advertising pages, we learn that a place of meeting has been secured, and that a General Meeting will be held on the 28th inst., at 8 p.m., when the following papers will be read:—"Pill Making and Excipients," by Mr. MARSHALL; and "A Botanical Ramble in Cumberland," by Mr. STUART, both of which will be followed by discussion. There is also to be an exhibition of microscopes and other subjects of interest. We are glad to express our wishes for the successful progress of this Association, which if wisely managed and earnestly supported may become very serviceable to many, if not all, of its members, and contribute to remove the too general belief in the necessity of "cramming" as a preparation for attendance in the examination room.

THE SOCIETY OF ARTS LECTURES.

THE three courses of CANTOR lectures to be delivered before the Society of Arts in the course of the present session are announced as follows:—The first is to be a course of six lectures on "The Manufacture of Paper," to be delivered by W. ARNOTT, F.C.S., commencing Monday, November 26. The subject of the second course is to be "The Application of Photography to the Production of Printing Surfaces and Pictures in Pigment," to be delivered by T. BOLAS, F.C.S., and commencing February 18. The last course will commence on the 8th of April and is to be on "Some Researches on Putrefactive Changes and their Results in Relation to the Preservation of Animal Substances," by B. W. RICHARDSON, M.D., F.R.S. There will also be a course of three special lectures on "Explosions in Coal Mines," to be delivered by T. WILLS, F.C.S., on Monday, January 28, and two following Monday evenings, at eight o'clock.

THE COUNTER PRACTICE APPEAL CASE.

IT will be seen from a report on page 413 that the hearing of the appeal against the decision of the judge in the case of the *Apothecaries' Society* versus *Shepperley* was commenced in the Exchequer Court on Wednesday last, before the Lord Chief Baron and Baron CLEASBY. Sir HENRY JAMES, however, began his opening argument only half an hour before the rising of the Court, and the further hearing was adjourned to Friday morning.

MUNICIPAL HONOURS TO PHARMACISTS.

WE are enabled by the courtesy of correspondents to add to the list given under this heading last week. Mr. FRANK BAKER, Chemist and Druggist, has been re-elected Mayor of Sandwich. Also, Mr. HENRY GOODALL, Pharmaceutical Chemist, has been elected a Common Councilman at Derby.

Provincial Transactions.

DOVER CHEMISTS' ASSOCIATION.

The annual meeting of this Association was held on the 14th inst., at the Apollonian Hall.

The balance sheet was presented and passed, and an opinion was expressed by the chairman and others that the working of the Association, especially with regard to the maintenance of uniform prices, had been satisfactory and beneficial.

Messrs. W. H. Cotterell and J. F. Brown were re-appointed as chairman and secretary, respectively, for the forthcoming year.

After the business had been despatched the members present sat down to an excellent supper.

In proposing the health of the Mayor and Corporation, coupled with the name of Alderman Bottle, the Secretary remarked that whatever success had been attained by their Association was very largely due to that gentleman's kind advice and assistance, which he had always placed at their disposal.

Other toasts were drunk and a very pleasant evening was spent.

HULL CHEMISTS' ASSOCIATION.

The first meeting for the present year, of the above Association, was held at the Cross Keys Hotel, on Thursday evening, November 15. The President, Mr. C. B. Bell, in the chair.

After the ordinary business had been concluded, the President delivered an inaugural address, in the course of which he reviewed the history of the Pharmaceutical Society and the various Acts of Parliament passed in connection with it from its formation to the present time, and then proceeded to notice the Chemists' Trade Association and its doings. In conclusion, he expressed his regret at the apathy shown by the junior members of the trade with regard to the various facilities for study and advancement now provided for them, and urged all chemists to stand together for the common good.

Mr. J. F. Smith proposed and Mr. Thyar seconded a vote of thanks to the President for his very able address.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

Erratum.—In the abstract of Mr. Perkins's paper, read before the Chemical Society on the 1st inst., which appeared on p. 379, the word "cumenyl" was by mistake written "cinnenyl" throughout the report.

A meeting of this Society was held on Thursday, November 15, Dr. Gladstone, President, in the chair. After the announcement of visitors and presents to the library, and confirmation of minutes, the following certificates were read for the first time:—T. C. Cloud, G. F. Dowdeswell, A. Ginders, A. Linnell, D. A. Louis, S. P. Pickering, and J. Woodland.

The President then announced that Professor Odling being unable to attend, his paper on "Gallium" would be postponed till the next meeting of the Society.

The following papers were read:—

(1). *First Report to the Chemical Society on Some Points in Chemical Dynamics.* By Dr. WRIGHT and Mr. LUFF.—From certain theoretical considerations the authors thought it probable that the temperature at which a body A begins to act on a compound B C, in accordance with the reaction A + B C = A B + C, is a function of (*a*) the physical condition of the substances, (*b*) the heat disturbance (evolution or absorption), taking place during the change, and (*c*) the chemical habitudes of the bodies, possibly expressible as numerical values constant for each substance. An elaborate series of experiments has, therefore, been made to find out the temperatures at which the actions of carbonic oxide, hydrogen, and free amorphous carbon on oxide of iron or oxide of copper are first perceptible. Various specimens of oxides in different states of physical aggregation were prepared, in some instances by special devices so as to obtain products free from all traces of organic matters derived from washing water, filters, etc. The temperatures at which carbonic oxide begins to act on these bodies were determined by keeping portions of them in a tube at various temperatures, passing pure carbonic oxide (carefully freed from admixed oxygen—from air) over them, and noting the temperature at which the issuing gases first rendered baryta water turbid. The temperatures of initial action of hydrogen were obtained by dissolving the substances after exposure to its action in hydrochloric acid or hydrochloric acid and ferric chloride, and testing by permanganate or ferricyanide. The temperatures at which carbon begins to act were found by observing when gas began to be evolved on heating in a Sprengel vacuum, due corrections being made for small quantities of carbonic oxide and carbonic acid occluded by the carbon, and gradually given off by it during the heating. Two kinds of carbon were used, one a dense sugar charcoal, well washed, ignited in a current of chlorine, and again treated in a closed platinum crucible till no more hydrochloric acid came off; the other a light pulverulent carbon, obtained by acting on ferric oxide with carbonic oxide at about 400° C., and dissolving out the reduced iron by hydrochloric acid. The general results of these experiments are as follows:—(1) The temperature at which the action of a given reducing agent on a given metallic oxide is first perceptible depends on the physical condition of the metallic oxide, and if carbon be the reducing agent also on the physical condition of the carbon. (2) Hydrogen uniformly begins to act on a given oxide, in a given physical state, at a lower temperature than carbon, and carbonic oxide begins to act at a lower temperature than hydrogen. (3) When the physical state is about the same, a given reducing agent begins to act on copper oxide at a lower temperature than on iron oxide. (4) The two last conclusions are special cases of the general rule that *the greater the algebraic value of the heat disturbance* (*i.e.*, the more heat evolution or the less heat absorption) *the lower the temperature at which the action is first noticeable.* (This rule is, however, not general for all metallic oxides, as it does not apply in the case of iron and tin oxides.) Thus in the case of the reactions: 1. $CuO + CO_2 = Cu + CO_3$; 2. $CuO + H_2 = Cu + H_2O$; 3. $2\,CuO + C = 2\,Cu + CO_2$; there is respectively an evolution of heat to the extent of $+30{\cdot}05$, $+19{\cdot}52$, and $+9{\cdot}48$ kilogram heat units per sixteen grams of oxygen transferred from metallic oxide to reducing agent. In the corresponding action of these agents on Fe_2O_3 the heat disturbances are $+1{\cdot}90$, $-8{\cdot}63$, and $-18{\cdot}67$. In the reduction of cuprous oxide there is almost the same heat disturbance as in that of cupric oxide (by the same reducing agent). Hence the temperature of initial action on Cu_2O of each agent lies very close to that found for CuO, in fact within the limits afforded by variations in physical state. The action of carbonic oxide on precipitated cupric oxide is noticeable at a temperature much lower than 100°; at 100° carbonic oxide is wholly converted into carbonic acid by heating it in sealed tubes with some oxide. By passing carbonic oxide over cupric oxide at 100° pyrophoric copper is soon obtained almost free from oxide. If the carbonic oxide contain a trace of air the partially reduced oxide serves as a conveyer of oxygen to the carbonic oxide, thus producing much more carbonic acid than that due to the cupric oxide acted on. The actual temperature values obtained with chief specimens examined are given in the following table:—

Substance.	Initial temperature of action with—			
	CO	H	Sugar C	C from CO
Copper oxide by precipitation	60°	85	390	350
Copper oxide by ignition of nitrate	125	175	430	390
Copper oxide by prolonged heating of metal	146	172	440	430
Cuprous oxide . . .	110	155	380	345
Ferric oxide by calcining $FeSO_4$	202	260	450	430
Ferric oxide precipitated	90	195	450	—
Ferric oxide precipitated and gently ignited .	220	245	450	430

Dr. Gladstone pointed out that the above paper was the first fruits of the research fund, and was therefore of special interest to the Society. He complimented the authors on opening out a new region of thought and experiment, and on the success with which they had overcome the great difficulties they had met with in obtaining substances sufficiently pure for their experiments.

Mr. Vernon Harcourt asked if any experiments had been made as to the effect of time on the reactions; whether, for instance, given an unlimited time, a reaction would not go on to the end at a comparatively low temperature. He would also like some further explanation of the term "algebraic value of the heat disturbance."

Mr. Wills inquired whether after heating, cooling and reheating a substance several times, a rising of the initial temperature of reaction did not take place, also how it was possible to compare the action of a solid body such as carbon with the action of gases such as hydrogen.

After some remarks by Messrs. Kingzett, Neison and Drs. Dupré and Armstrong, Dr. Wright briefly replied to Mr. Harcourt, that experiments of the kind indicated were in progress; that the above term was used simply to express the production of heat, whether it was a positive or a minus quantity, and that "heat disturbance" was simply a translation of the German word Wärmetönung. In reply to Mr. Wills, Dr. Wright said that the temperature did rise, and so care was taken always to have fresh samples for each experiment; that as regards the relative action of a solid and a gas, the solid would no doubt act very much less rapidly, but this would not affect the temperature at which the action commenced.

The next paper was communicated by Mr. C. T. Kingzett.—

(2.) *On the Chemistry of Cocoa Butter*, Part I. *Two New Fatty Acids*.—The specimen of cocoa butter examined was hard, imperfectly transparent, slightly yellowish, melting at about 30° C., and when once melted remaining liquid for some time at a lower temperature. It contained no volatile or soluble fatty acids. The acids were prepared by saponifying the butter, and decomposing the soaps with dilute sulphuric or hydrochloric acid; they were purified by recrystallization from alcohol, fractionating, etc. Many analyses and melting points of products obtained are given. The extreme acids found were represented by the formulæ $C_{12}H_{26}O_2$ and $C_{64}H_{128}O_2$. The first is the formula of lauric acid, but it melts at 57·5° (lauric acid melting at 43° C.), so it must contain some acid of a higher melting point than lauric acid, and therefore the acid itself must be lower in the series $C_nH_{2n}O_2$ than lauric acid. The highest known acid in this series is melissic acid $C_{30}H_{60}O_2$. The new acid has a formula not lower than $C_{64}H_{128}O_2$. Many salts of these acids were prepared, but details as to their composition are reserved for a future communication. The lower acid crystallizes in pearly plates or fine long needles. The higher acid, for which the author proposes the name of "theobromic acid," crystallizes in microscopic needles or granules, melts at 72·2° C., at a high temperature distils apparently unchanged, is somewhat electric when dry, a property which is possessed in a high degree by its silver salt. The total fatty acids of cocoa butter contain about 20 per cent. oleic acid. The author, in conclusion, points out that text books state "that cocoa butter yields, almost exclusively, stearic acid." From the present investigations it is clear that this statement is entirely incorrect; it is based entirely on determinations of the melting point of the fatty acids obtained.

Mr. Duffy said that from the proportion of carbon he should have expected a higher melting point, observing that a very small quantity of a fatty acid containing a low percentage of carbon had an enormous effect on the melting point of a high acid, perhaps from some kind of solvent action.

The next paper was read by Dr. Armstrong—

"*On the Influence Exerted by Time and Mass in Certain Reactions in which Insoluble Salts are Produced.* By M. M. P. Muir.—In this paper the author has worked out in detail a suggestion given by Dr. Gladstone (*Chem. Soc. Journ.*, ix., 54), to the following effect:—"It is easily conceivable that where the affinity for each other of two substances that produce an insoluble compound is very weak the action may last some time, and become evident to our senses. Is not this actually the case when carbonate of soda in solution is added to chloride of calcium?" The author has taken solutions containing known quantities of calcium chloride and potassium or sodium carbonate, allowed them to stand for a certain number of minutes after mixing, collected the precipitate formed, and thus has obtained approximate results, which are, however, strictly comparable among themselves. These results the author has represented graphically in curves. The greater portion of the chemical change takes place during the first five minutes, afterwards the reaction decreases very much in rapidity. The relative masses of the salts exert an important influence; thus, if the mass of alkaline carbonate be four times that required by the equation $CaCl_2 + M_2CO_3 = 2MCl + CaCO_3$, the action is completed in five minutes, but if the salts are in mixed equivalent quantities, the action is not completed in forty-six hours. For short periods of time potassium carbonate yields more calcium carbonate than sodium carbonate. An increase of the temperature produces in every case an increase in the amount of calcium carbonate formed in a given time, whilst dilution causes a marked decrease. Dilution with sodium or potassium chloride solution gives a still more marked decrease. A discontinuous addition of one of the solutions to the other causes the action to reach a maximum more quickly than when the solutions are mixed at one time, but the maximum so reached is no greater than that which is finally attained under the latter conditions. In conclusion, the author gives the results obtained by mixing solutions of calcium sulphate and sodium chloride, allowing them to remain for four weeks, and then estimating the calcium sulphate decomposed, when 14·2 molecules of sodium chloride were used to one of calcium sulphate, 32·9 per cent. of the latter was decomposed. Further experiments on this subject are promised (see Graham, *Chem. Soc. Journ.*, iii., 60). Graham has shown that sulphates of potassium and sodium are decomposed by lime water yielding diffusates containing caustic potash and soda respectively. The above experiments show how the chlorides of the alkalies may yield sulphates, and these in turn may furnish the alkaline carbonates required by plants.

The Society then adjourned to Dec. 6th, when the following papers will be read:—

1. "Gallium," by Professor Odling. 2. "The Constitution of the Terpenes and of Camphor," by Dr. Armstrong. 3. "Potable Waters," by Dr. Mills.

Parliamentary and Law Proceedings.

PROSECUTION BY THE APOTHECARIES' SOCIETY.

At the Bradford County Court on Tuesday, Nov. 13, John Faull, chemist and druggist, White Abbey Road, Bradford, was the defendant in an action brought by the Master and Wardens of the Society of Apothecaries of the City of London, by whom he was charged with having acted as an apothecary without being lawfully entitled to do so. Mr. Gane (instructed by Mr. C. L. Atkinson, on behalf of the Bradford Medical Ethical Society) appeared for the Apothecaries' Society; and Mr. West (instructed by Messrs. Lancaster and Wright) appeared for the defendant.

Mr. Gane said that action was brought for an infringement of the Apothecaries Act, 55 George III., chapter 194, section 20, which imposed a penalty of £20 on every person who infringed the Act by acting as apothecary without having passed the requisite examination. The question for the Court to decide was not whether defendant had acted as a chemist—for he was entitled to do so—but whether he had acted as an apothecary. The distinction between the two was laid down by Mr. Justice Cresswell in Moody and Robinson *v.* the Apothecaries' Company, where it was said that a chemist was one who supplied drugs which were asked for; an apothecary was one who judged of the symptoms of the persons who came to him, and used his judgment in determining what medicines he should give them. In that case it was not a question as to whether the medicines given by Mr. Faull were beneficial or not, but whether the provisions of the Act of Parliament had been observed. The cases which would be sworn to in evidence were not surgical cases, but cases of disease, and two of them were very serious. In one of them the child, who was suffering from bronchitis and pleurisy, died two or three days after Mr. Faull had mixed up medicine for it. In another case a young woman was suffering from diarrhœa; she went to Mr. Faull—who did not recommend her to go to a doctor—and died within a day or two afterwards. He therefore submitted that Mr. Faull had brought himself under the penal section of the Act.

After referring to a case at Nottingham brought by the Apothecaries' Society (*Law Times Reports*, vol. xxxiv., page 76), Mr. Gane called Leah Hayhirst, a married woman, living in Queen Street, Bradford, who said that on the 29th May last her child, eleven months old, named Ann, was very unwell, and she took the child to Mr. Faull. She asked him if the child was dangerously ill, and he replied that she was not, but that she had a "snatch" of the bronchitis. He gave her a bottle of medicine, for which she paid 9*d.*, and a plaster, and told her to give the child a spoonful of the medicine three times a day.

Mr. West here observed that, as it was not suggested that anything like malpractice had taken place, or that what was given to the child was not suited to her, there was no need going into what took place subsequent to the medicine being given. It was not suggested that any subsequent illness was occasioned by the medicines Mr. Faull gave; the question was, had Mr. Faull infringed that section of the Act which had been referred to.

Mr. Gane agreed with Mr. West, and observed that the offence would remain even if the child had not taken the medicine, because defendant's act was complete in itself.

Elizabeth Page, 40, Raven Street, Bradford, said that on the 28th July she and her daughter, Mary Ann, went to Mr. Faull's shop. They asked for medicine for diarrhœa, and defendant told her daughter to go home and take a dose of the medicine. He also gave her two powders, and charged 8*d.* for the bottle of medicine and 2*d.* for the powders.

Samuel Hibbert, King Street, Bradford, stated that on the 25th May he went to the defendant's shop and asked for a bottle of medicine, as he had got the sick headache and felt a little bit dizzy. Defendant made up a bottle of medicine, and said if that did not put him right he was to call again.—By Mr. West: I did not call again, for it did me good. I have not got the bottle. I went into the Durham Ox public-house to get a draught, and there was a party in who, when he heard that I had got a bottle of medicine from the defendant's, asked to see it, and when he got hold of it said he would keep it. I told him he might do so.

Charlotte Sykes, of Manningham, said that on July 25th she took her child, Martha, to Mr. Faull, and told him her baby was very ill. She asked if he could give her anything that would do her child good, and he said "Yes." He then made her up a bottle of medicine and gave her a powder and a plaster. On a subsequent day she took the child, who had become worse, to the defendant: he then gave her another bottle of medicine and two powders.

Mr. West then addressed the Court some length, contending that Mr. Faull had done nothing more than was customary on the part of druggists, and nothing more than he had a perfect right to do.

His Honour observed that if he were directing a jury in such a matter he should certainly tell them that a druggist who mixed up and dispensed medicines on his own judgment was liable under the Act. He should not, however, give judgment in the case at present, but would wait until the appeal in a similar case from the decision of the Nottingham County Court Judge had been disposed of. He fully believed the case then before the Court was not by any means an isolated one, and that many besides Mr. Faull would be interested in the decision which was ultimately arrived at.—*Bradford Observer*.

APOTHECARIES' SOCIETY *v.* SHEPPERLEY.

This case, which is an appeal from the decision of the Judge of the Nottingham County Court, came on for hearing in the High Court of Justice, Exchequer Division, on November 20, before the Lord Chief Baron Kelly and Mr. Baron Cleasby.

Sir Henry James: My Lords, this is a special case stated by the learned county court judge, and raises a question of considerable practical importance as to how far persons carrying on the business of chemists and druggists may exercise a discretion in the sale of medicines across the counter. That, my Lords, is the main point to be determined.

The Lord Chief Baron: For whom do you appear?

Sir Henry James: My Lord, I appear for the appellant, who was the defendant.

The Lord Chief Baron: Who is the appellant; is he convicted?

Sir Henry James: Yes, my Lord, in penalties under the Act of George III. The learned judge felt it was a case for the determination of a superior court, and on the case stated by him the appeal comes before your lordships. My Lords, to direct your attention to what is the matter for your determination, I may say generally the question is whether the chemist and druggist who in his shop, dealing across the counter, sells certain drugs and wares in his business and to a certain extent exercises his discretion in the sale of those wares—how far he practises as an apothecary so as to bring him within the penal clauses of the Act of George III. My Lords, the case is stated as follows:—

"This action was brought by the Master, Wardens, and Society of the Art and Mystery of Apothecaries of the City of London against the appellant, the defendant, who is a chemist and druggist, carrying on business at Nottingham, within the jurisdiction of the Nottingham County Court, to recover from him the sum of £20, under and by virtue of the 55 George III., chap. 194, sec. 20, for that he, not being a person who on the first day of August, 1815, was actually practising as an apothecary, did, on the 22nd August, 1876, and on divers days within six months next before the commencement of this action, act and practise as an apothecary, in the town and county of the town of Nottingham, by then and there as such apothecary attending and advising and furnishing and supplying medicines to Thomas Jolly Death, one Daniel Hubbard, and divers other persons, without having obtained such certificate as by the said Act is directed, contrary to the form of the statute in such case made and provided. Upon the evidence set forth in my notes hereunto annexed I find that in one instance the defendant in his shop heard a patient state his complaint, examined him medically, and supplied the said patient with medicine of his, the said defendant's, own prescription, and in another instance supplied medicine to a patient for an eruption on his face. The question for the Court is whether these facts brought the defendant within the provisions of 55 George III. chap. 194, and made him liable to the penalty therein provided and sought to be recovered in this action."

Although these findings are in the terms mentioned, your lordships see the learned judge there leaves it to the Court to determine whether those facts brought the defendant within the provisions of the 55 George III. My Lords, the notes are rather long because they refer to some cases on which the learned judge seems to have found in favour of the chemist's conduct, but the only evidence which applies to the determination of the judge in favour of the Apothecaries' Company is the evidence that has relation to the cases of two persons, Thomas Jolly Death and Daniel Hubbard. Those are the two cases to which he refers. Now, my Lords, the evidence as to those cases occurs at page 3.

The Lord Chief Baron: Then you pass by George Shepperley's evidence—that is not one of the two cases.

Sir Henry James: Shepperley, my Lord, is the defendant himself. I shall have to refer to it, but the formal evidence with respect to the two cases I have mentioned had better commence with the persons referred to, and Thomas Jolly Death's commences at page 3. He says:—

"On 22nd August, last year, I went to defendant's shop. I saw him behind the general counter. I said, 'I want some medicine for sore throat, cold, tightness of chest.' Defendant came between the two counters and told me to face the light and open my throat. He looked down my throat. He said, 'a tightness there,' touching my chest. He said, 'I think I can give you something to relieve you. I do not think there is much amiss with you.' He gave me a bottle of medicine, to be taken internally and I paid him 1s. I said, 'How much?' and he said, '1s., please. I think you will find relief from that; if not, come again.' I did not specify the medicine I required."

What follows is simply what took place after the cause of action arose, and does not affect the case. Mr. Shepperley himself says as to Death's case:—

"I believe Death called and asked me to look at his throat. If he asked me I should. I believe I gave him medicine. I don't think he brought a prescription. I do not recollect what I charged him. I have several times refused to prescribe."

Then, my Lords, as to Hubbard's case, the evidence of Mr. Shepperley himself, which is the only evidence, is at page 2.

"I believe I saw Daniel Hubbard in my shop. He asked for something for some pimples he had on his face. I saw that he had pimples. I did not examine him at all. We have a dispensing counter, which has a screen in front of it. I did not take him behind the screen. I don't think he went there. I think I gave him some medicine. This (bottle put in) has my writing on it."

The Lord Chief Baron: Is that the bottle which came from this man, Hubbard?

Sir Henry James: I am told so.

Mr. Baron Cleasby: How did the county court judge decide this?

Sir Henry James: He found, leaving it to your Lordships' further judgment, that this case is a case coming within the 20th section.

Mr. Baron Cleasby: I did not collect that.

The Lord Chief Baron: No; he puts it as a mere question as if it were a special case without any decision. However, you say he decided to convict.

Sir Henry James: Certainly, my Lord, *pro formâ;* that is the way I read it, leaving it to your Lordships to say whether if you had been in his position you would have held that he had committed an offence within the 20th section of the Act of 55 George III. Now, my Lords, the better way will be perhaps to call attention to the Act, and then to place before you the position of an apothecary, and to see whether this is acting or prescribing as an apothecary. My Lords, the Act under which these proceedings are taken is the Act which first really recognized the status of an apothecary in this country. It is the Act of 1815, 55 George III. chap. 194. The Act recites the original charter of James I. under which the apothecaries were incorporated. My Lords, probably at that time, the time of James I., the principal object of that incorporation was to give power to certain persons to search in the shops or warehouses where drugs were sold so as to see that no spurious articles were sold. The status of apothecaries at that time was scarcely recognized other than as vendors or sellers of drugs. You will find this expressed all through the Act, I think, and I shall trace the history of the time, to show that they afterwards became of much more importance than they formerly were, and this is a portion of that recognition and legislation which placed them in that position. Your Lordships will see, if you have the Act, the first section recites the charter of James I. Then, my Lords, it repeals that charter to a certain extent, and the first material section is the 5th section. That section says:—

"And whereas it is the duty of every person using or exercising the art and mystery of an apothecary to prepare with exactness, and to dispense such medicines as may be directed for the sick by any physician lawfully licensed to practise physic by the President and Commonalty of the Faculty of Physic in London, or by either of the two Universities of Oxford or Cambridge; therefore, for the further protection, security and benefit of his Majesty's subjects and for the better regulation of the practice of physic throughout England and Wales, be it enacted that if any person using or exercising the art and mystery of an apothecary shall at any time knowingly, wilfully and contumaciously refuse to make, mix, compound, prepare, give, apply or administer, or any way to sell, set on sale, put forth, or put to sale to any person or persons whatever, any medicines, compound medicines, or medicinal compositions, or shall deliberately or negligently, falsely, unfaithfully, fraudulently, or unduly make, mix, compound, prepare, give, apply, or administer, or any way sell, set on sale, put forth or put to sale to any person or persons whatever, any medicines, compound medicines, or medicinal compositions as directed by any prescription order or receipt signed with the initials in his own handwriting of any physician so lawfully licensed to practise physic, such person or persons so offending shall be guilty of an offence."

My Lords, the only material part there is, that this is dealing with that which at this time could only have been one portion of the apothecary's duty, namely, that of making up prescriptions or of compounding that which formed the subject of the prescription in selling the medicine; but the art and mystery could not be confined to that, because at this time druggists were equally with apothecaries selling drugs and making up prescriptions of physicians. Now, my Lords, the next section which is important is the 14th, and this deals with the practising of apothecaries, and allowing them to do so without examination. This was the first time apothecaries had been subjected to any examination.

"And to prevent any person or persons from practising as an apothecary without being properly qualified to practise as such, be it further enacted that from and after the 1st day of August, 1815, it shall not be lawful for any person or persons (except persons already in practice as such), to practise as an apothecary in any part of England or Wales, unless he or they shall have been examined by the said Court of Examiners, or the major part of them, and have received a certificate of his or their being duly qualified to practise as such from the said Court of Examiners, or the major part of them, as aforesaid, who are hereby authorized and required to examine all person and persons applying to them for the purpose of ascertaining the skill and abilities of such person or persons in the science and practice of medicine and his or their fitness and qualification to practise as an apothecary; and the said Court of Examiners, or the major part of them, are hereby empowered either to reject such person or persons, or to grant a certificate of such examination, and of his or their qualification to practise as an apothecary as aforesaid: Provided always that no person shall be admitted to such examination until he shall have attained the full age of twenty-one years."

Your Lordships will see the examination was to deal with that which would be a matter of science and of skill, not as formerly that which had been one of the principal duties of an apothecary, namely, to sell medicines and drugs; but the examiners had to ascertain "the skill and abilities of such person or persons in the science and practice of medicine." Of course, my Lord, that is distinct from the certificate granted by the College of Physicians for those who practise as such, but this was as to their skill in dealing with all medical cases, such as fevers and other internal disorders. This is the science and practice of medicine, which was perfectly distinct of course from the practice of an apothecary to sell the drugs and medicines in the shops which frequently before it had been their habit to wholly carry on their business in. Now, my Lords, we come to the section under which these proceedings are taken; but perhaps I should mention that by section 15—

"No person shall be admitted to any such examination for a certificate to practise as an apothecary, unless he shall have served an apprenticeship of not less than five years to an apothecary and unless he shall produce testimonials to the satisfaction of the said Court of Examiners of a sufficient medical education."

Then, my Lords, section 20 is the section under which these proceedings have been taken, and upon the words of this section much turns. It is enacted—

"That if any person (except such as are then actually practising as such), shall, after the said 1st day of August, 1815, act or practise as an apothecary in any part of England or Wales, without having obtained such certificate as aforesaid, every person so offending shall for every such offence forfeit and pay the sum of £20; and if any person (except such as are then acting as such and excepting persons who have actually served an apprenticeship as aforesaid), shall after the said 1st day of August, 1815, act as an assistant to any apothecary, to compound and dispense medicines without having obtained such certificate as aforesaid, every person so offending shall for every such offence forfeit and pay the sum of £5."

Then, my Lords, there is a section to which many of the authorities in these cases have had reference, section 21, which enacts—

"That no apothecary shall be allowed to recover any charges claimed by him in any court of law unless such apothecary shall prove on the trial that he was in practice as an apothecary prior to or on the said 1st day of August, 1815, or that he has obtained a certificate to practise as an apothecary under the provisions of this Act."

Then, my Lords, as far as I know there is only one other section which bears much on the matter, and that is section 28, by which a distinct question in this case arises.

The learned judges here conferred for a short time.

By such section, my Lords, it is provided as follows :- -

Mr. Baron Cleasby: You have not Wilcox's Medical Acts in court, have you?

Sir Henry James: No, my Lord, I have not.

Mr. Baron Cleasby: They are all collected together there, I think.

Sir Henry James: My Lords, I think I have most of the Acts. There are very few Acts which I think affect this question, and I will mention them as I go on.

The learned judges again conferred.

Sir Henry James: My Lords, I was calling attention to section 28, that reserves the rights of chemists and druggists, not then at the time of passing this Act, living, but to any person who at any future time shall carry on the business of a chemist and druggist, to carry on that business. The section is this:—

"That nothing in this Act contained shall extend or be construed to extend, to prejudice, or in any way to affect the trade or business of a chemist and druggist in the buying, preparing, compounding, dispensing, and vending drugs, medicines, and medicinable compounds, wholesale and retail; but all persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same shall and may use, exercise, and carry on the same trade or business in such manner and as fully and amply to all intents and purposes as the same trade or business was used, exercised or carried on by chemists and druggists before the passing of this Act."

My Lords, as I have said, a distinct and separate point arises on that section 28.

The Lord Chief Baron: You defer dealing with that point at present. You say there is a separate point which arises on that, but you do not propose to deal with that at present. You are going back now to the first point?

Sir Henry James: My Lords, I will go back to the first point; I call that the second point, and I have mentioned it in calling attention to the sections, and I will deal with the points as they occur in order. Now, my Lords, I have to ask your Lordships to determine whether upon the facts to which we shall have to apply certain considerations, the appellant here has, under the 20th section of this Act 1815, 55 George III, acted or practised as an apothecary. And, my Lords, what I have to submit to your Lordships is that, inasmuch as those words "acting or practising as an apothecary" must have a certain meaning attached to them, it must mean that the person is holding himself out and carrying on business as an apothecary, and it is not enough for one person who, for charity's sake or for any other reason, does one isolated act, or one thing that an apothecary would do as a portion of his profession, in order to bring him within this clause and to render him subject to penalties.

Mr. Baron Cleasby: You are on the 20th section now.

Sir Henry James: Yes, my Lord. A chemist and druggist from the very nature of his business, if he never opens his mouth, exercises no discretion, takes no notice of anything that a person who applies to him as a customer is suffering from, but simply sells him a medicine, is in one sense doing that which an apothecary also does. An apothecary sells his medicine, obtains a price for it, and can sue for it as for goods sold and delivered. An apothecary can do that, and therefore, my Lords, if it is to be said that a chemist and druggist who, without doubt, as not only the ostensible but the real purpose and the object of his business is selling his wares, and if for the sale of his wares he does a certain thing which equally an apothecary in carrying on his business as an apothecary does, that, with submission, is not enough to bring the chemist and druggist within the section of the Act. The words must be looked at in a broader view, namely, "acting or practising as an apothecary," meaning thereby, that he generally and substantially carries on his business so as to come upon equal lines with the carrying on of the profession of an apothecary.

The Lord Chief Baron: You are contending that one act is not sufficient.

Sir Henry James: My Lord, I am contending not that one act may not in some cases be evidence that he is generally carrying on or acting as an apothecary, but what I am contending is that one act, when it is only one act, or portion of what an apothecary does to carry on his business, and when I show to your Lordships that that act is what a chemist and druggist would do to carry on his business, then that is not acting as an apothecary.

The Lord Chief Baron: It is the entire act, because you know the act which the defendant has done is a compound act; there are two acts, in fact there are three acts.

Sir Henry James: I have a little more to say before we come to the evidence, if you will allow me.

The Lord Chief Baron: There is one act with this person of the name of Death, and there is another with a person of the name of Hubbard. I wish to ask you whether you mean to contend that there must be more than one act, or possibly more than two acts, to constitute an "acting or practising" within the meaning of the section?

Sir Henry James: I did not mean one act in that sense.

The Lord Chief Baron: Because you used the term "holding out." I wished distinctly to understand what your argument was.

Sir Henry James: My Lord, nothing was further from my mind than to use the words "one act" in the sense of selling to one person. I was dealing with a general act away from the facts before your Lordships, in the sense of one portion of the profession of an apothecary. I am speaking of things in their generic sense, not particularly in relation to what is before you. What I wish to convey to your Lordships is that whereas an apothecary in the practice of his profession has to do, as I will show your Lordships, naturally a great many things which require the exercise of skill and knowledge (as we have found in the Act of 55 George III. "science and skill" are the words used) that whilst and when he practises his profession generally he will have to attend to many classes of cases and diseases requiring skill and knowledge, and in the course of carrying on that profession will have to sell his drugs to the person he may attend; it is not sufficient to bring a chemist and druggist within this section of this Act to show that he, equally with the apothecary, does one of those acts of which the apothecary does many, in order to carry on his profession. I hope I am making myself understood in the sense I am using the words "one act." I am not speaking of selling across the counter, but merely of a chemist and druggist generally, every day of his life, doing one of those things which I shall have to admit that an apothecary equally does, namely, selling his drugs.

The Lord Chief Baron: Is there any doubt that that is so?

Sir Henry James: I hope not, my Lord; but I must go by steps.

The Lord Chief Baron: There is no doubt that every chemist and druggist in London compounds certain medicines.

Sir Henry James: Quite so, my Lord.

The Lord Chief Baron: An apothecary does the same.

Sir Henry James: And he must dispense them?

The Lord Chief Baron: Dispense them; by that you mean sell them?

Sir Henry James: Well, my Lord, of course, he takes money for them; but probably dispensing will have rather a different meaning from the word selling.

The Lord Chief Baron: What is the meaning you give to it?

Sir Henry James: I rather want your Lordships to define that because it is important you should. Perhaps "selling" would apply to a patent medicine, a thing that is of known constituents, like a box of matches, which a chemist might sell across his shop counter; but I should think dispensing had rather a different meaning.

The Lord Chief Baron: It may; therefore I ask what you mean by it? You may call it dispensing physicians' prescriptions. When a prescription is laid before the chemist he prepares it and supplies it for money. It is selling, but you may also call it by the grander name of dispensing.

Sir Henry James: I should have thought selling a very much narrower word.

The Lord Chief Baron: Suppose it is; I only want to know in what sense you use the word?

Sir Henry James: I use selling in the same sense in which any ware is sold requiring no skill.

Mr. Baron Cleasby: Merely selling; "dispensed" would be sold for a purpose.

Sir Henry James: Certainly, my Lord; dispense may include the making up of medicine; it may include the mixing together several chemical substances in order to produce one result, and it must be subject to the skill of the chemist and to the qualities of those different substances and the proportionate quantities in which they are to be placed together, as they may be poisons if not properly compounded.

Mr. Baron Cleasby: And as to the mode of mixing them?

Sir Henry James: And as to the mode of mixing them. That is, as I was endeavouring to show, if not properly mixed they may be poisonous.

The Lord Chief Baron: I know but two modes in which a chemist and druggist sells or dispenses his medicines, and it is very immaterial, as it strikes me, whether you call one or the other, or both, by the terms selling or dispensing. If a man goes into a shop and asks for a bottle of Godfrey's Cordial the thing is handed to him. That is a very well known patent medicine, or once was a well known preparation; the chemist hands it to him and receives the money. Another mode in which the chemist carries on his business is where a physician's prescription is brought to him and laid before him and he then compounds a medicine, which perhaps he had never seen or heard of in all its ingredients before, according to the prescription placed before him. Then he returns the prescription at the same time as he delivers the medicine which is compounded, mentioning the price he charges, and receives the money for it. You may call either of those modes selling or dispensing.

Sir Henry James: Is there not another class of dispensing medicine? The second is the case where the chemist has a prescription which may be written by a physician; he makes that up and dispenses it, but there he would only have to use that skill which Baron Cleasby has referred to, the skill of mixing that which he is directed to use.

The Lord Chief Baron: What is the third, if there be a third mode?

Sir Henry James: Suppose a person goes to a shop without any prescription, and says, give me a dose of epsom salts. The chemist sells those epsom salts to him, but he must look at the nature of the person who asks him for it, a strong man or a weak child. He must give a proper, fair dose of epsom salts. He cannot say "Do you want two ounces?" and see the person take treble what he ought to take.

The Lord Chief Baron: There you know; I am not saying it is not a part of his business, but if he is asked for a dose of epsom salts, and inasmuch as a dose for a full grown strong man and a dose for a child of six years old would be a very different quantity, he must ask for whom it is wanted and for what purpose.

Sir Henry James: I am putting the case of a person being drugged on the premises, if I may use the expression, supposing it is a harmless thing to do. You go into a chemist's shop and say to him, "Give me an effervescing draught." He dispenses that to the person who asks him.

You do not carry it away in a bottle, you drink it on the spot.

The Lord Chief Baron: No; I see no objection to that, you may subdivide the business of a chemist and druggist into twenty such operations if you please.

Sir Henry James: That is dispensing surely in one sense if we are treating him. Take the case I put of the salts. There he acts not upon a prescription, which is directory, which he has to obey; but not giving the mode in which that which is asked for has to be taken, he must in dispensing that, bring to bear some skill, because of course the customer does not know how it is to be mixed, and what quantity of water corresponds to a proportionate quantity of salts. That kind of dispensing by the chemist is the result of his skill and knowledge of his business.

The Lord Chief Baron: You will be able to tell us, when we resume this argument, into how many subdivisions you say a chemist's business is to be divided.

The further hearing of this case was then adjourned until Friday next.

Dispensing Memoranda.

[21]. ℥ VERSUS OUNCE.—I quite agree with the writer of the article "The Month," p. 323, that when ℥j of powder (or any solid) is ordered in prescription, 480 grains should be used, and further, I contend that this is intended by the prescriber; therefore I cannot accept the conclusions arrived at by your two correspondents on this subject in the Journal of November 3.

Previous to 1864 there was a certain weight in use in the Pharmacopœia, distinguished by the sign ℥ and whose value was 480 grains; when the first edition of the British Pharmacopœia appeared in 1864, the old familiar ℥ had disappeared, and the ounce with a value of 437·5 grains assigned to it was substituted, just in the same way that many old preparations were omitted and new ones took their places. Bear in mind, the actual value of the ℥ was not altered, but simply omitted altogether; I suppose no one would question the right of a medical man to order any preparation of the Pharmacopœia of 1851, if he felt so disposed, or if it suited his convenience to do so. The same argument I contend applies to the use of the signs ℥ and ounce; so long as the present anomalous systems of weights and measures remain in use, so long will medical men continue to use the sign ℥, because it represents a value conveniently sub-divisible without fractions, which the ounce cannot be said to do. When magnes. sulph. ℥j is prescribed in an eight ounce mixture, the dose of which is ordered to be an eighth part, does the prescriber intend the dose of magnes. sulph. to be 54·6875 grains or 60 grains? Common sense points to the latter I think. The signs ℥ and ounce represent two distinct values, and cannot in any way be considered synonymous. The majority of the instances quoted by "P. B." refer to the sale of articles, and therefore are entirely beside the question at issue. To call a thing in every day use obsolete is, to say the least of it, a perversion of terms; as well might beefsteaks, tea, sugar, etc., be considered obsolete. To the question asked by "P. B," "How do you know that when a physician writes in a prescription for ℥j he intends 480 grains to be dispensed?" I answer, because he has used a sign which never had, and is never likely to have any other value; and therefore conversancy with the "latent" intention of prescribers is not needed.

That Dr. Symes, usually so clear and precise in his argument, should have been led into the same error (the synonymous values of the ℥ and ounce) is a matter of some astonishment to me. Had he quoted the whole of the paragraph instead of half of it, I think he and most others would have seen the fallacy of the argument based upon it. It is as follows:—"It is strongly urged upon all medical men to avoid the use of the terms ounce and pound with reference to any other than the avoirdupois or imperial standard weights; but it will be optional with the physician in prescribing to use the symbols ℈ and ʒ (and I imagine ℥ too if he feels inclined to do so) the former representing twenty and the latter sixty grains, if such should be found to conduce to accuracy or convenience." This to my mind clearly indicates that when a physician wishes to order ℥j or 480 grains, he must do so and not use the term ounce which, as a matter of fact, they do. I cannot commend the writer of "The Month" for the way in which he subsequently confuses the signs ℥ and ounce. However clear the advice given to No. 21, the same cannot be said of the answer to No. 26, in which the querist is told that there is a formula in the British Pharmacopœia for ung. belladonnæ, eighty grains ext. to ℥j (*sic*) of lard. My copy reads:—Extract of belladonna eighty grains; prepared lard one ounce. I regard the whole system (or rather no-system) of weights and measures in use in this country as an unmitigated evil, and a disgrace to our boasted civilization. Let us then be unanimous in our efforts to rid ourselves of this incubus and to do all in our power to hasten the adoption of that which is admitted by all scientific men to be the only complete perfect and philosophic system, I mean the metric, which based as it is on the eternal harmonies, may be expected to last

"Not for an age, but for all time."

Fairfield, Liverpool. ALFRED E. TANNER.

[21]. AVOIRDUPOIS VERSUS APOTHECARIES' WEIGHT.—The chief argument of Mr. Wilkinson is based on the ground that ℥j means an apothecaries' ounce = 480 grains and nothing else, and on a desire for uniformity, in illustration of which he quotes a very unusual prescription that to my mind tells more against than for his argument. I cannot of course determine the nature of the prescriptions received by these gentlemen, but I do know as a fact that of those dispensed at our own pharmacies at least ninety-nine out of every hundred containing the sign ℥ do so with unmistakable evidence that 437½ grains (or a bulk equivalent to that weight of distilled water), and not 480 grains are intended.

℞ Ung. Cetacei . . . . ℥j

Would any dispenser send 480 grains? If he weighed it at all he would give an avoirdupois ounce, but most probably he would fill a pot of that capacity, which according to Maw's list, p. 50, should be accurate water measure. If the ointment ordered be a compound one, thus—

℞ Hydr. Iodi Rub. . . . . . gr. xxxij
Ung. Simplicis . . . . . . ℥j.

Would a tyro dispenser commit such an error as to translate this ℥j as an apothecaries'? Clearly, the intention of the medical man would be to prescribe an ointment double in strength to that of the B. P., or about one half that of the Dub. Pharm.

Again

℞ Potassæ Bicarb. . . . . ℥j
Aquæ Destil. . . . . ℥x.
M.

Whatever doubt may exist as to the intended value of the former ℥ no one can entertain any as to that of the latter; why then (for the sake of uniformity) (?) will people advocate putting two different values on the same sign, in the same prescription?

Mr. Mackay commences by "unhesitatingly bearing you out in rendering the sign of ℥j as equivalent to 480 grains." He of course refers to the article "The Month," in your Journal of October 27 and to number 21 of that article. May I ask him to read number 26, where the writer states that "in the British Pharmacopœia there is a formula for Ung. Belladonnæ, 80 grains, extr. to ℥j lard"? Of course he will unhesitatingly endorse the value here set on the sign ℥j also. He then renders seven reasons why he advocates the apothecaries' ounce in dispensing.

1. States that a wide difference exists as regards accuracy in buying, selling, and dispensing medicines. I fail to see the application.

2. Apologizes on behalf of the B. P. for the introduction of avoirdupois weight. No apology is necessary, it was simply consistent with common sense and with the progressive requirements of the age.

3. Assumes that the physician when prescribing remembers the exact number of grains of solid ingredients per ounce of each tincture in the B. B. "because it is there stated," whilst he is incapable of remembering that the avoirdupois ounce contains 437½ grains. This requires no answer; but I may say, however, that in many instances the B. P. does not give the number of grains of crude drug per ounce of tincture but the number of ounces per pint. Ginger, gentian, columba, and senna, are examples.

4. Is irrelevant.

5, 6, and 7. Are formulæ and surmises, with some moralizing on the perversity of human nature. Finally we are pointed to "an error which is too prevalent in making solutions for dispensing, *e.g.*, chloral hydrate one ounce, water to two ounces; the solution is then labelled and the strength marked one in one."

This very discussion tends to prove that even pharmacists cannot lay claim to infallibility. But may I ask, sir, did such an absurd blunder as this ever really occur, or is it not rather the result of a creative imagination on the part of the writer?

The apothecary and his ounce are both things of the past; it is true the former has an Act and the latter a name, but the sooner both are repealed the better.

Liverpool. CHARLES SYMES.

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[21]. TROY OR AVOIRDUPOIS WEIGHT?—Your correspondent, Mr. Wilkinson, in the issue of October 17, quotes the now obsolete London Pharmacopœia of 1851, on this question, thus appearing altogether to ignore the more certain, precise, and simple definitions which have been adopted in the later, and now the only legally recognized standard, viz., the British Pharmacopœia of 1867. Any one thoughtfully reading the preface which is attached to that work surely can never so stultify himself as to uphold that the troy system of weights and measures has now any official sanction. In order to illustrate the following remarks I may be allowed to requote some portions; italicizing those which have a direct bearing upon the subject:—

"The grain weight established by law in this country is well known and well defined. It has been in use from a very remote period, and forms a convenient unit for estimating the weight of many medicines. The avoirdupois *ounce and pound, being the weights practically used in the sale of medicines*, and generally in commercial transactions, *were adopted in the edition of* 1864, *and are still retained in preference to troy weights of the same denominations.*"

"*It is strongly urged upon all medical men* to avoid the use of the terms *ounce* and *pound*, with reference *to any other* than the *avoirdupois or imperial standard weight.*"

If the above quotation has any meaning, it is that the symbol ℥ ought *never* to be used, or that, if it should be used, "*it is strongly urged*" that it be translatable into the avoirdupois ounce of 437·5 grains. But, to all rules, however rigidly laid down, there must be exceptions. Doubtless it was never intended by a dogmatic fiat to sweep away all vestiges of the troy system, but rather, (from the language employed) we would infer that the compilers of the B. P. intended that the troy system (like many other old relics which had served their day and generation) should be allowed to die a painless death. The exception therefore, in all cases where the symbol ℥ is used, will be the *intention* of the prescriber in using it. If the dispenser should happen to know that it *represents in the prescriber's mind* 480 grains by weight, then he has no option but to honestly dispense that quantity. If he does not know the prescriber's intention, then he has the above official sanction for dispensing 437·5 grains. In these days of high pressure, physicians have not the time to write their prescriptions as a logician would lay down a proposition, or a mathematician a theorem, and therefore, particularly under the present transitional system of weights and measures, a dispenser must exercise his judgment in dispensing some prescriptions.

In the following a consistent adherent to the troy system would be placed in a quandary:—

℞ Sodæ Bicarb. . . . . ℥ss.
Ammon. Carb. . . . . ʒj.
Tinct. Gent. Co. . . . . ℥j.
Spt. Chlorof. . . . . ʒss.
Aquæ, ad . . . . ℔j.

Doubtless he would dispense a troy half-ounce of sodic carbonate, but would probably for the nonce break faith with his pet system, and send out a *sixteen-ounce* mixture. Again:—

Acid. Hydrocyan. Dil. . . . . . ℈j.
Sodæ Bicarb. . . . . ʒij.
Spt. Amm. Arom. . . . . . . ʒij.
Liq. Bismuth. . . . . ℥j.
Aquæ, ad . . . . Oss.

Would this consistent adherent send twenty grains (by weight) of hydrocyanic acid, or only twenty minims (by measure), which would only weigh 18·174? Would he dispense an eight or a ten-ounce mixture? These are doubtless frivolous questions, but they serve to show up the present anomalous state of dispensing weights and measures. The above examples also show that there is something besides mere official sanction influencing the dispenser in his daily routine. Time-honoured customs and the prescriber's intentions must not be rudely interfered with.

In sending out liquid medicines, however, a dispenser disregards and ignores the troy system. For in all graduated measures as now used, every fluid ounce represents only 437·5 grains by weight of distilled water at 60° Fahrenheit, and 30 inches barometric pressure. If the troy system must be adopted in dispensing solids, why have measures graduated by that of avoirdupois?

In conclusion we may be permitted to hope, that (in the words—though not in the spirit of Mr. J. B. L. Mackay) "the time is not far distant, when no ambiguity shall arise about the interpretation of signs"—a time, in which the old complex and heterogeneous order of weights and measures with their empiric units, the grain, inch and yard, shall give place to that of the stabler and homogeneous new, having the metre as its sole unit of weight and measurement.

Worcester. G. S.

[21.] AVOIRDUPOIS OR APOTHECARIES'.—In "The Month," October 27, you state that the apothecaries' ounce of 480 grains should be used, when ℥j occurs in a prescription.

Three of your correspondents hold the same opinion, but three others think the avoirdupois ounce of 437·5 grains is meant. I have always used the avoirdupois ounce myself, and never doubted but that I was fulfilling the intention of the prescriber.

I believe a doctor would write ʒviij if he meant 480 grains; I know at least one who does so, and who intends 437·5 grains when he writes ℥j, and was no more aware that it was used with any other intention than I was myself. J. S. W.

Dundee.

Notes and Queries.

[562]. BRILLIANTINE.—"TOM" will find the following formula a good one for a Brilliantine, that after separating remains clear.

℞	Ol. Amygdalæ	℥viij.
	Spt. Vin. Rect.	℥ij.
	Otto	♏v.
	Ol. Bergam.	♏xvj.
	Ess. Mosch.	♏xxx.

"TENENS."

[563]. GINGER BEER SYRUP.—Will any one kindly give me a good formula for Ginger Beer Syrup for aerated waters that will produce a good frothy head when poured into the glass?

I have tried albumen, but it causes the drink to become turbid in a few days.

Also should be glad to know the address of a maker of refrigerators. S. R.

Obituary.

Notice has been received of the death of the following:—

On the 12th of November, 1877, Mr. William Battle Maltby, Chemist and Druggist, Bail Gate, Lincoln. Aged 50 years.

On the 15th of November, 1877, Mr. William Henry Mackereth, Pharmaceutical Chemist, Ulverston, Lancashire. Aged 50 years. Mr. Mackereth had been a Member of the Pharmaceutical Society since 1870.

We regret also to announce the death of Mr. Francis George Warrick, late of the firm of Warrick Brothers, Old Swan Lane. Mr. Warrick died at the Vice-Consulate, Nice, on the 20th November. Aged 53 years.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

ADMISSION OF WOMEN TO MEMBERSHIP.

Sir,—As you very necessarily remark the question the Council reserved for the next annual meeting is not whether women may practise pharmacy—that happily, if Mr. Fryer represents the general opinion, is beyond the Society's control—but whether, having obtained the requisite qualifications, they ought to be refused the privileges of membership. It is well that in any discussion this should be distinctly borne in mind. The first paragraph of Mr. Fryer's letter travels over the old ground as to the right of women to compete with men in the business of life, and as such is outside the issue, so I refrain from commenting upon it, though the way in which fact, fiction, argument, and sentiment have been mixed up, is simply delightful. So, again, the reasons which Mr. Fryer has given us are simply those which have been used times out of number on the general question—he uses them merely with more or less reference to his own trade.

Granting, for one moment, that pharmacy is a business in which women are not fitted to engage, I would ask, does the experience of the last few years entitle Mr. Fryer and those who think with him to the belief that throwing as many obstacles as possible in the way, will have any deterrent influence? I think not. Instance the medical profession where the argument of unfitness would seem to have especial force. For the last eight or ten years women have been "pegging away,"—and with what result? One by one the numerous barriers existing and carefully created by their wiser male friends have been overcome till at length, though it has been all fight and little favour—to paraphrase Mr. Fryer,—complete success has attended their efforts and practically women can now study and enter the profession on the same terms as men. Everywhere it is beginning to be felt that it is impossible to draw any arbitrary line as to what women may or may not do. Witness the recent act of the University of London and the tendency of the Cambridge University during the past three or four years. Men have a right to judge and act for themselves, and women equally have this right and will undoubtedly exert it in the future. Surely, then, if women are not qualified for the pharmaceutical profession, the only way of convincing them is to let them find it out for themselves, even to the "bitter end." An "obstructive policy" will only increase their exertions and have a contrary effect to that intended. Viewed as a question of expediency it will be wiser to open unreservedly our doors, and allow women to compete on equal terms with ourselves.

I would remind Mr. Fryer that after all it is only a very few women who are ever likely to enter into competition with us in this or any other profession, and that "mixture of the sexes in a pharmacy," of which he has so evident a horror, is not likely to occur to any extent, if at all.

I am sorry to see the old argument cropping up about "the market being already crowded;" at the best, this is but a selfish motive, and as such can have little weight, and we might equally apply the same reasoning amongst ourselves, and attempt to limit the number of chemists in the country at large.

Whatever conclusion the annual meeting may arrive at, eventually there can be but one result. It will be felt that in fairness and consistency women must be admitted unreservedly to all the privileges of the Society equally with ourselves.

REES PRICE.

54, *Loftus Road, Shepherd's Bush, W.*

Sir,—With a view of obtaining the feeling of the members on this subject, could not our local secretaries issue papers for voting, and send them up to Bloomsbury Square before the annual meeting?

If this could be managed, I think we should have a fair representation of the general opinion of the Society, and this would tend to strengthen the action of the Council.

The attendance at the annual meeting in May next will represent the London members chiefly, and therefore cannot be a fair test of the views of country subscribers.

The time has certainly gone by for entering into the subject of the desirability, or otherwise, of women becoming pharmacists, and it is only now a question of their joining the Society as members or associates.

I think we cannot in justice deny the examined women membership, although we may not legally be obliged to admit them; and as a matter of fair play, as well as of policy, it would be better to do so. Let us consider the question of the admission of women to practise medicine or pharmacy together, as the subjects to be taught are so nearly allied that they may be regarded as different branches of the healing art.

If women have made up their minds to enter upon either sphere of labour, let the medical schools and the Pharmaceutical Society open their doors to them, on an equal footing with men, and give them all the advantages possible.

If, by our adverse votes, we refuse the ladies membership, we shall find them entering on the practice of medicine and pharmacy by irregular channels, and we shall be contributing to the increase of the various classes of unqualified practitioners and chemists. Taking, for a moment, the broader view of the alleviation of human suffering and distress, it will be generally acknowledged that women are particularly adopted for nurses and attendants on the sick, and it cannot be doubted that there are women of sufficient skill and ability to act in any emergency.

Why should a woman be debarred from rising higher than a subservient help to the physician?

Medical and pharmaceutical knowledge is not for one sex only, but for all. There are now in this country many women, suffering from various diseases, who would gladly consult one of their own sex, but linger on, afraid to tell their symptoms to a man.

Although there is much in the practice of medicine and pharmacy to shock the sensibility and refinement of many educated ladies, there are undoubtedly some of sufficient nerve and energy to conquer all such difficulties, and instead of giving way under their first trials, struggle on bravely and devotedly to cure and heal.

Looked at in a commercial point of view I am afraid lady pharmacists would find many obstacles in their way, and think it would only be in dispensing and the higher class businesses where they would succeed. However, that remains to be proved, and there is no valid reason why a woman who is qualified should not employ male assistants to help her.

As to first entering to learn the business, it would not be desirable to have young ladies of eighteen or twenty behind the counter with young men, but there are lots of businesses conducted by a principal only, where ladies might be employed as pupils. Let us cast aside trade prejudices, and consider well the question on its merits.

We cannot deny that the ladies pass first-class examinations, and have proved themselves well qualified to practise pharmacy. By all means let us give them a fair chance of showing their practical ability and usefulness; but as competitors in business they must not expect any favours.

I can testify to the truth of Mr. Hampson's remark that some people think more of M.P.S. and the Society's arms than the title pharmaceutical chemist on prescription envelopes, etc.

FRATER.

SHALL LADIES REGISTERED AS PHARMACEUTICAL CHEMISTS OR CHEMISTS AND DRUGGISTS BE REFUSED ADMISSION INTO THE PHARMACEUTICAL SOCIETY?

Sir,—In order to obtain a correct view of this question which is to be submitted to the next annual meeting it is well that we should consider what are the privileges involved in the membership or associateship of the Pharmaceutical Society, and whether lady pharmacists are capable of using these privileges equally with gentlemen.

In the first place there is the privilege of attending the meetings of the Society, scientific and political; of voting and being voted for; of reading papers and discussing those read by others. No one will deny to the ladies who have embarked or may embark in pharmacy the same intellectual standing enjoyed by their sisters throughout the world. Are they then capable of taking part in our meetings? Our general or political meetings are but councils where each member has less responsibility. To decide whether ladies are capable of exercising this responsibility affirmatively, I have but to point to the great school boards with their illustrious ladies—indeed, to the greatest councils of the empire.

Are ladies qualified to read papers, etc.? Upon this point, although I might find abundant affirmative evidence in this country, I prefer to speak of what I know concerning the valuable work done by lady classmates of mine in societies, which were but smaller pharmaceutical societies, notably in the society which originally suggested the formation of the School of Pharmacy Students' Association. This work has appeared in the American and English journals, and its worth has been acknowledged by eminent men of science.

In the next place must be mentioned the privilege of securing the *Pharmaceutical Journal*, and of using the museum and library in the same way as gentlemen. These are truly valuable privileges, but are so purely educational that no one, I think, would wish to refuse them to lady pharmacists. I may be told, however, that beneath these lie concealed such dreadful things as the admission of ladies into the Society's laboratories—they are already permitted to attend the lectures of Professors Redwood and Bentley. Though this, of course, does not necessarily and may not follow from their admission into the Society, it is a result which I should view with satisfaction. I do not say so from theoretical reasons, but from knowledge, having worked side by side with ladies in the laboratories of the University of Michigan. I may say also that most favourable reports reach me from time to time of the results of co-education throughout the various departments of that advanced institution.

What privileges remain to be mentioned? The privilege of contributing to the Society's funds, and of using a distinction said to be of greater value in some cases than the title pharmaceutical chemist. I need not discuss the first of these privileges, and the last might have been passed over almost as briefly, were it not the only privilege which the Society can refuse that could possibly be an "obstacle" to ladies entering pharmacy. For this reason and because Mr. Fryer of Scarborough, in his letter in last week's Journal, advocates the opinion that it is extreme folly to take away any remaining barriers to the entry of ladies into pharmacy, I must dwell somewhat upon it. Will the refusal of this distinction have the effect desired by Mr. Fryer? I think not. It may, however, in certain cases reduce somewhat the income of the lady pharmacist—this I commend to Mr. Fryer and those who wish for a "fair fight," for I can assure him a "fair fight" is all lady pharmacists desire.

But Mr. Fryer tells us that under the present examination system a "fair fight" is impossible. He says that "ladies by exercising their charms over examiners will have an unfair advantage over gentlemen." Well, Mr. Editor, in institutions where this whole question has become one of the past no such difficulty has been met with. But even if it should prove true in the case of our examiners, the remedy is clear and easy. Let us have ladies on the examining board.

Mr. Fryer goes farther. He says in effect that not only the examiners but the Council, even our distinguished President himself, has become affected by this dreaded feminine influence, so that in matters pertaining to lady pharmacists he cannot pass unbiassed judgment. Well, if this be so, which I deny, our remedy is likewise clear. Let us have ladies on the Council — let us find places for the Helen Taylors of pharmacy.

Mr. Fryer then, seeming to fear the competition of ladies who pass first in the list, tells us what a dreadful business pharmacy is. One is forced to ask, if pharmacy be so poor an occupation, why grudge it to the ladies?

In conclusion, Mr. Editor, I submit that while there may be, and doubtless are, two opinions upon the question of the desirability of ladies entering pharmacy—a question which may be well left to the ladies themselves—there is little room for but one opinion concerning the admission of qualified ladies into the Pharmaceutical Society.

The Pharmaceutical Society is and should be in the widest sense an educational society, and as such we shall have to say at the next annual meeting whether we shall associate with ourselves in our educational advancement these lady pharmacists of admitted attainments, or whether we shall deny them that advantage. ALFRED SENIER,

12, *Brownswood Villas, Finsbury Park, N.*

A Subscriber.—Dammar resin.

Student.—The chlorine may be removed by passing the gas through a weak solution of caustic alkali.

W. J. Hayward.—Griffith's 'Lessons on Prescriptions and the Art of Prescribing' (Macmillan).

W. J. Wilson.—Numerous recipes for "hair restorers" have been already given and may be found in the ordinary receipt books.

Chemist.—We believe the preparation is a proprietary one and that the formula has not been published.

W. Fever is thanked for the notes, which however are not suited for insertion in this Journal.

Erratum.—In p. 380, col. ii., line 9 from bottom, *for* "aluminium" *read* "aluminum sulphate."

C. Crook.—Please to repeat your question.

"*Student.*"—A small work on Botany, by Professor Bentley, is included in the series of 'Manuals of Elementary Science,' published by the Society for the Propagation of Christian Knowledge, price 1*s.* The same author' 'Manual of Botany,' is published by Messrs. Churchill.

"*Occidens.*"—(1 and 2) *Lepidozia setacca*; (3 and 4) *Tetraphis pellucida*; (5) *Hypnum confertum*; (6) *Hypnum cupressiforme.*

J. R. G.—According to King ('American Dispensatory') the dose of the aqueous extract of chelidonium is from 5 to 10 grains. See before, p. 303.

W. B. B.—A formula for the preparation of cod liver oil and ferrous iodide will be found in vol. vii., p. 28.

S. Thornton.—No doubt the name is "Rew," and the preparation could probably be obtained through your wholesale druggist.

H. G.—(1) An unsuccessful candidate may compete again provided that he is not disqualified by age or other cause; (2) The examination may be held at any centre at which the Preliminary examination is conducted.

L. L. is referred to the rule respecting anonymous communications.

E. W.—We are afraid that the death of flies would hardly be considered as proving the presence of quassia in beer.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Paris, Mr. Storey, Mr. Bottle, Mr. Smith, Mr. Mee, Mr. Dewson, Mr. Lines, Secretary of Glasgow Assistants' Association Dr. Thorowgood, H. M. H., J. S. W., S. R., S. H., Tenens, Vaseline, A Moral Pharmacist.

CURARA, THE PROPOSED REMEDY FOR RABIES.

SYNONYMS: *Ourari, Urari, Wourara, Wourali, Wouraly.*

BY JOHN MOSS, F.C.S. LONDON AND BERLIN.

A few remarks on this drug cannot fail to be of interest at a time when hydrophobia, against which it has been again proposed as a remedy, is more rife amongst us than at any previous period of our history; and notes taken from various sources for personal information may be the means of saving time and labour to those who have felt disposed to look up the matter with a similar object, or, what is still more important, may give information to those who have not the opportunity of informing themselves.

Historical: Source and Preparation.—Curara is the name of a poison used by all the South American savages between the Amazon and the Orinoco to arm the points of their arrows. Most authorities say that it is made by the Macoushi Indians, but the Acaaway tribe is also mentioned.

Perhaps the first account of the wourali poison is given by Waterton in his 'Wanderings in South America.'* Waterton was a Yorkshire gentleman of independent means with a passion for travel and the study of nature. When in Guiana, in 1812, he travelled 800 miles into the interior for the two purposes of collecting a quantity of the strongest wourali poison and of reaching the inland frontier post of Portuguese Guiana. He succeeded in obtaining a sufficient quantity of the poison from the Indians of Macoushia, a district far away in the wilds of Essequibo and Demerara. This tribe has a reputation above all others for preparing wourali of the utmost potency, and Waterton gives their mode of preparing it as related to him. He does not seem to have made any inquiry respecting the plant yielding the principal ingredient, or to have obtained a specimen of it, and hence he left the subject obscured in gloom, which, though pierced here and there by subsequent explorers, has not yet been entirely dissipated. The process is briefly this:—Thin scrapings of the wourali vine and of a bitter root are percolated with water in a crude fashion into an earthern pot, and into the percolate the green and glutinous juice of two kinds of bulbous plants is squeezed with the hands; two kinds of ants, the one large and black, the other small and red, are bruised up with the fangs of two kinds of snakes and a quantity of the strongest Indian pepper, and all is thrown into the pot, which is then placed over a fire, and the contents boiled down to a thick syrup of a deep brown colour. If on trial it is found to be satisfactory, the syrup is poured into a calabash and carefully covered with leaves and deerskin and set aside in a dry place.

Two accounts subsequently given by different Indians to Dr. Hancock, who resided for many years in British Guiana, agreed very well with each other. "They called the plant *mavacuri*, and say it is of the gourd kind, or one of the cucurbitaceæ, of the size of a large orange, round, and having a hard shell or pericarp, which is used at times to contain the poison. In regard to the manufacture of the poison they in general add nothing, though some to thicken it add the bark. They merely peel or scrape off the bark and bruise it well in a mortar. The mass is then put into a funnel or cartocho made with wild plantain leaves, and having a little cotton at the bottom to strain it; plenty of cold water is thrown over it, and they proceed in the same manner as in drawing the lixivium of ashes. This infusion is put into an earthern pot and boiled down to a proper consistence. Neither had any idea of the addition of other substances." Another account given to Dr. Hancock by Mr. J. Forsyth states, "I send you a small branch of the wourari vine and two other vines, called *woorarybally* and *courampoey*, which the Indians use as auxiliaries to strengthen the former. . . . The inner bark or rind of the root (for it is the root only that is used) is scraped off into some vessel. The wooraybally root undergoes the same process, but it is the vine itself of the courampoey that is used. To these, mixed together and well boiled down with some water, the Indians add some peppers, and further boil the whole mass to a thick syrup. This account of the process I have had from the Indians." Dr. Hancock, in 1837,* added to his previous statements that in the preparation of the poison by the Macoushis, the slimy barks of the *kyheri* and *quasima* are added to give tenacity to the extract; and that it is considered of such importance that it gives names to several mountains and rivers, as *Oorariquera* and *Oorarimetsa*. He has also remarked "the most efficient poison is prepared from the worari vine alone." Subsequent writers have accepted the results of Schomburgk's inquiries as conclusive that the poison is furnished chiefly or entirely by *Strychnos toxifera* (Loganiaceæ), viz., Redwood,† Wormley,‡ Bentley,§ and the authors of the 'Imperial Dictionary,' who also mention *Lasiostoma Curare*. Gregory|| says, "from some plant of the family *Strychneæ*," whilst Watts¶ says that it is a "resinous substance consisting of the aqueous extract of a climbing plant (genus *Strychneæ*)." Taylor** states that the poison is called "curara from the plant *curari* from which it is obtained." Those who are agreed upon the identity of the plant yielding the poison are yet at variance as regards the relation of the two. Whilst Wormley avers "Schomburgk states that it consists alone of vegetable matter and chiefly of an *extract of the bark of Strychnos toxifera*," Bentley says "The *juice of Strychnos toxifera* is the basis of the celebrated wourali poison of Guiana." It is probable that both statements are correct, and that the *modus operandi* of the savage varies with the materials at his command in the changing seasons of the year.

Description.—As to the poison itself the descriptions do not always tally. Waterton speaks of it as "a thick syrup of a deep brown colour," and afterwards (1838), in an autobiograpy which forms the introduction to his 'Essays on Natural History,' he says, "on opening the wax in which it is enclosed, I found it quite soft and ready for use, although it had not been looked at for above twenty years." Hancock's Indian informants merely state that "it is boiled down to a proper consistence;" and Forsyth says "the Indians boil the whole mass to a thick

* New edition, Routledge.

* *Med. Gaz.*, xx., 280.

† Gray's 'Supplement to the Pharmacopœia,' 3rd ed., 393.

‡ 'Micro-Chemistry of Poisons,' 561.

§ 'Manual of Botany,' 2nd ed., 590.

|| 'Organic Chemistry,' 430.

¶ 'Dictionary of Chemistry,' ii., 186.

** 'On Poisons,' 3rd ed., 787.

syrup." The syrupy form would be the most convenient for smearing arrows. Wormley, Watts, and Taylor have a general agreement in their description of the poison, which, according to Watts, is a brown-black, shining, brittle, resinous mass, almost wholly soluble in water, either cold or warm; sparingly soluble in absolute, easily in aqueous alcohol, partially soluble in ether; bitter taste, neutral reaction. This description applies to the curara which is at the present time found in commerce.

Even as regards the stability of curara the authorities are not in accord. Professor Redwood in a very comprehensive paper on this poison* says "it is necessary to keep the wourali in a perfectly dry state and when thus preserved it appears to preserve its properties for a considerable number of years." Bernard (Taylor on Poisons) found that some which had been loosely kept on the tip of an arrow for fifteen years killed an animal very quickly. He preserved it in a state of solution in water for fifteen years without any loss of its power. It is obvious that the syrupy preparations spoken of by Waterton and others cannot be preserved in a perfectly dry state, and possibly the presence of pepper in these enables them to bear damp and exposure.

Properties and Antidotes.—For the poisonous effects of curara to be produced it must be introduced directly into the circulation by puncture. Gregory says that it may be swallowed with impunity; probably he meant in the mininum doses which will produce death by inoculation.

Dr. Hancock says, "Its operation on the animal frame is most mysterious. It extinguishes the vital spark without a pang or struggle if prepared without any other substance being added; for the most efficient poison is prepared from the worari vine alone. The sensation and effect it produces are extremely analogous to those which arise from excessive bleeding—the animal under its influence sinking from existence in the most placid swoon." Compare this with Pereira's statement that "it produces paralysis with convulsive movements, death from apparently suspended respiration." Waterton, in Guiana, inoculated several animals with the poison for the purpose of trying the efficacy of the antidotes recommended by the Indians, viz., holding the animal for a considerable time up to the mouth in water, pouring the juice of the sugar cane down the throat, and rum. All were ineffectual. He says, "it is supposed by some that wind introduced into the lungs by means of a small pair of bellows would revive the poisoned patient, provided the operation be continued for a sufficient length of time." On his return to England this method was tried upon an ass which lay apparently dead from the effects of the poison, and in four hours she rose up and walked about, but was not well for more than a year. She survived the operation twenty-five years. Waterton did not believe that the Indians had a sure antidote; if they had "it is likely they would carry it about with them, or resort to it immediately after being wounded, if at hand, and their confidence in its efficacy would greatly diminish the horror they betray when you point a poisoned arrow at them. . . . Should the part affected admit of it let a ligature be tied tight round the wound, and have immediate recourse to the knife." It is stated in the paper by Professor Redwood, previously quoted, and to which I am indebted for numerous references, that "it appears that the Indians are acquainted with some means of recovering animals from the effects of the poison, and are in the habit of shooting monkeys, birds, etc., with the poisoned arrows, and after bringing them to the ground, resuscitating them." It may be that the means referred to consisted in simply allowing nature to assert herself and throw off the effects of a quantity of poison too minute to produce death, for Waterton observed that to kill a bulky animal, such as a hog, several large arrows were used by the Indians, though one small arrow was sufficient for a monkey or a bird, and it would frequently happen that the wounded animal was only weakened to such an extent that its capture was easy, and its recovery a matter of time. In Mayo's 'Outlines of Physiology' a case is described in which a horse was recovered from an attack of tetanus and locked-jaw by means of wourali, death from the latter being prevented by artificial respiration continued for four hours. Artificial respiration was the method employed to overcome arrest of respiration in a woman, aged twenty-four, who was under treatment for hydrophobia, and cured by subcutaneous injection of curara.*

Active Principle.—The supposition entertained some time ago that the poisonous properties of curara were due to the presence of strychnia was doubtless based upon the fact that curara contains a body which greatly resembles strychnia in its chemical behaviour, notably in its reaction with chromic acid. It is remarkable that such a supposition should be entertained in face of the fact that curara does not produce poisonous effects when administered by the mouth in quantities which have been known to produce death when introduced directly into the circulation.

So far from curara containing strychnia, Vella† has shown that each is an antidote to the other. His experiments were of two kinds: first, those in which animals poisoned by the introduction of strychnia into the stomach received into the blood successive doses of ourari, in such a manner as to exactly subdue the manifestations of tetanic convulsions; secondly, those in which a mixture of strychnia and ourari was injected into the blood of animals. In a dog weighing 5½ kilos., two centigrammes of hydrochlorate of strychnia administered by the mouth were neutralized in three hours by three centigrammes of ourari injected into the blood. Three days after the dog was killed by two centigrammes of strychnia alone. In another experiment two milligrammes of strychnia and fifteen milligrammes of ourari in water were injected into the jugular vein of a dog weighing 8·7 kilos. without effect. Eight hours afterwards the same dose of strychnia produced death in ten minutes.

Roulin and Boussingault‡ were the first to attribute the poisonous action of curara to *curarine.* They obtained the latter as an amorphous, horny mass of a yellowish colour. Preyer§ was the first to isolate curarine in the crystalline form; according to him it has the formula $C_{10}H_{15}N$. It is very hygroscopic; has a very bitter taste; crystallizes in colourless four-sided prisms; dissolves freely in water and alcohol, less easily in chloroform and amyl al-

* *Pharm. Journ.*, O. S., iii., p. 75.

* *Medical Times and Gazette*, Oct. 6, 1877, 396.

† *Pharm. Journ.*, [2], vol. ii., 213.

‡ *Ann. Ch. Phys.*, 2, xxxix., 24. 1828.

§ *Bull. Soc. Chim.*, 2, iv., 238. 1865.

cohol; and is insoluble in anhydrous ether, benzol, turpentine, and carbon disulphide. It blues litmus very slightly, acquires a splendid and permanent blue colour in contact with sulphuric acid, purple red with nitric acid, and violet with potassium dichromate and sulphuric acid (like that of strychnia, but more permanent). Its hydrochloride, nitrate, sulphate, and acetate are crystallizable. Dragendorff* also finds that curarine is quite distinct from strychnine, and that a very active curara occurs in commerce in which neither strychnine nor brucine can be detected. His 'Manual de Toxicologie' contains an excellent chapter on curarine.

If Taylor's† statement that the properties of curara are due to the presence of this alkaloid be accepted, it explains and supports Hancock's statement that the most efficient poison is prepared from the wourari vine alone; for it will be observed that in the modes of preparation either the wourari vine alone is used or it is mentioned as the chief ingredient, the additional ones spoken of being used for superstitious reasons or others more useful. For example, the juice of the bulbous plants of Waterton, or the slimy barks of Hancock, would give adhesiveness to the poisonous extract and so prevent it rubbing or chipping off the arrow heads before they were required for use, and the pepper would have a certain antiseptic value. In Forsyth's account, the phrase, to "strengthen the former," should be understood rather in the sense of "to give it consistency" than that of "to increase its lethal power," for it is not conceivable that a poison owing its properties to a definite alkaloidal principle whose salts have the same power, could be rendered more poisonous by the addition of any substance which would not itself be weakened by the admixture. In the account first obtained by Dr. Hancock the mother-plant of the poison is called *mavacuri*. This is probably only another name for the wourari vine in a different locality, for from the description given to Dr. Hancock he concluded it to be one of the cucurbitaceæ, a family which includes many climbers. Even if the names refer to the same plant, that fact would not preclude the possibility of curarine existing in other species of the same order, whichever that may be.

Microscopical examination.—None of the students of curara appear to have submitted it to microscopical examination with a view to testing the statements relative to the addition of pepper and other matters possessing organized structure, such as barks, fangs, or ants. My own experiments in this direction, though very incomplete, are not without a certain interest. A minute fragment of curara corresponding to the description already given, was placed with a drop of alcohol (not the best solvent of curarine) on a slide, and well crushed by pressure on the cover. The central mass of curara was seen to be of a rich brown colour, and copiously studded with quadrilateral prisms. Outside this were numerous isolated crystals of the same shape, from which the cementing material had been dissolved by the alcohol, leaving them colourless. Scattered with tolerable evenness over the field were myriads of dusty particles having a faint tinge of yellow, and moving freely when the slide was rotated. The particles were subsequently found to be oxalate of calcium; the crystals were taken to be curarine. The cementing material was apparently amorphous.

Some curara which had been treated with water till it imparted only a faint tinge to the menstruum was, after drying, placed in a very dilute solution of potash, warmed and filtered. Some of the residue on the filter was placed on a glass slide and examined with water under the microscope; it resembled the dusty material previously seen. The filter was washed with acetic acid; oxalate of ammonium when added to the washings produced no change, nor did the washings give a yellow precipitate with nitric acid solution of molybdate of ammonium. Phosphate of calcium was therefore absent. The filter was further washed with very dilute hydrochloric acid and the washings similarly tested with oxalate of ammonium, when a copious precipitate was at once obtained. The matter insoluble in potash and in acetic acid was thus found to consist chiefly of oxalate of calcium; the proportion of this to the entire quantity of curara originally employed was such as to lead to the conclusion that either the stem or root used in the preparation of the poison was of no great thickness, or the bark was chiefly used in the preparation. The hydrochloric acid washings also were tested for phosphates; the result was negative, and it was therefore concluded that no bony material, such as serpents' fangs, could have been present in the curara. What remained after treatment with hydrochloric acid was so minute that it was regarded as of no account. The results of the examination are such as favour the opinion that curara as now met with is an aqueous extract of a bark, root or stem.

Solution of Curara for Hypodermic Injection.—The properties of curara preclude its medicinal use in any other form than that of a solution for hypodermic injection. For such a solution, to be ready for use at all times, certain characteristics are essential, or at least highly desirable. It must be of convenient strength, so that the dose fixed upon may bear a simple relation to the number of minims, yet not so strong that the injection of a quantity slightly in excess of what was intended may be of too great importance, and not so diluted that the maximum dose is inconveniently large. The solution should produce as little pain as possible when injected; having regard to the fact that rabies patients have an intensified dread of pain, this characteristic is perhaps more important in the particular solution now under consideration than in any other. The solution should not only be at all times prepared of the strength that it professes to be, but should keep well, and remain of that strength. To prepare a uniform solution of a drug so deadly and various as curara, one should always have recourse to the same parcel, of which the strength has been proved. Curarine or one of its salts might be used, but independently of the grave risks incurred in preparing them, we are as yet without trustworthy data upon which to frame a formula.

The keeping powers of a solution will depend in great measure on the menstruum. Water would produce a solution giving the minimum of pain when injected, and Taylor's statement that Bernard preserved curara in solution in water for two years without any loss of its power is confirmed by the experience of Dr. Lauder Brunton, who informs me that he has kept a very weak solution (1 in 1000) for the same period without change. I have prepared

* *Zeitschrift f. Chem.*, 2, iii., 28.
† 'On Poisons,' 3rd edition, 787.

solutions of curara in the following menstrua, viz., water, water with 0·2 per cent. of salicylic acid, diluted spirit of wine (1 to 3), and diluted glycerine (1 to 3). The last forms by far the best looking solution and is also the best solvent. It dissolves 85·2 per cent. of curara when left in contact with it for twenty-four hours and filtered; the dried residue hardly imparts any tinge to water. Water dissolves 83 per cent. and diluted spirit 79 per cent. of curara, and the dried residue in each case gives a decided tinge to water; both solutions are iridescent on the surface and at the side when examined in a glass vessel, and commence to deposit soon after being filtered. The glycerine solution deposits to a much smaller extent.

It appears, however, from observations kindly communicated to me by Dr. Ashburton Thompson, that even so weak a solution of glycerine as that indicated above, viz., 25 per cent., is productive of great pain when injected; and seeing that the aqueous solution keeps very well, I would propose the following formula as best meeting the requirements of the case:—

Hypodermic Injection of Curara.

Curara	gr. j.
Water.	min. xij.

Dissolve; let the solution stand forty-eight hours and filter.

Using this solution two-thirds, a half, third, or quarter of a grain may be given in a whole number of minims. Of the other strengths likely to suggest themselves, viz., one in ten and one in fifteen, the first would only allow of a tenth, and half a grain; and the second, of a fifteenth, a third, and two thirds of a grain being given in the same way. The accounts of the use of curara seem to indicate that the dose is from a quarter to half a grain.

CAUTION.—Curara requires to be handled with the utmost care. It should not be allowed to come into contact with a fresh cut or scratch. Two good rules would be—never to powder it in the dry condition, and never to touch it with the naked fingers.

300, *High Holborn.*

THE CONSTITUENTS OF PODOPHYLLUM PELTATUM.*

BY WILLIAM CHARLES A. BUSCH, PH.G.

Abstract from an Inaugural Essay.

The resin was prepared by mixing the concentrated incture—

1. *With water.*—A turbid liquid was obtained, which after a time produced a light-grey precipitate, completely soluble in ether and alkalies. On being again set aside the turbid liquid settled very slowly, but on the addition of a little muriatic acid it became clear, and the dark-grey precipitate was found to be nearly insoluble in ether, but readily soluble in alkalies.

2. *With acidulated water.*—A greyish precipitate was readily obtained which retained its colour if dried at the ordinary temperature; a higher temperature deepened the colour very perceptibly, and caused the resin to fuse to a blackish-brown mass, which on being dissolved in alcohol and precipitated by cold acidulated water was again obtained as a greyish powder. It was completely soluble in alcohol and alkalies, and partly in ether. On incineration a little ash was left. With hot water a solution was obtained which precipitated on cooling; cold water dissolved a little of the resin, the yellowish colour of the solution being discharged by an acid and reproduced with a darker shade by alkalies.

3. *With alum solution.*—A bright-yellow pulverulent precipitate was obtained, which darkened somewhat by hot water, but did not fuse to a brown mass. On incineration an ash was left, consisting mainly of alumina; boiling with dilute hydrochloric acid removed most of it from the resin, which afterwards left but very little ash.

Resin soluble in ether.—The officinal resin, obtained by precipitation with water acidulated with muriatic acid, yielded to ether sixty per cent. of its weight. This portion dissolved in alcohol with a light-brown colour; the solution had a bitterish taste, and was precipitated light-greyish by water, bright-yellow by alum solution and orange-yellow by alcoholic solution of lead acetate. All the precipitates dissolve to some extent in hot water, most of the dissolved portion being reprecipitated on cooling. The alum precipitate left 1·25 per cent. of ash, consisting of alumina; the resin obtained by evaporating the ether left no fixed residue.

Resin insoluble in ether.—It was found to have a bitter taste and to be soluble in alcohol and alkalies, and slightly so in water. The alcoholic solution became turbid on the addition of water, and very gradually yielded a greyish precipitate; acidulated water produced a similar precipitate, solutions of alum and of acetate of lead somewhat darker, but not yellow precipitates. The bright-yellow colour of the resin prepared with alum solution is therefore due only to the resin soluble in ether.

The aqueous solutions of both resins gave no reaction with Mayer's solution, except in one instance; their alkaline solutions were of a yellowish-brown colour, when sufficiently diluted with water were not precipitated by acids, and after having been boiled with dilute hydrochloric acid gave no indication of sugar with Trommer's test.

Principles soluble in water.—The tincture precipitated with acidulated water yielded a reddish filtrate, of a very bitter taste, and containing sugar, as indicated by Trommer's test. On concentrating the solution, an amorphous bitter mass separated, which dissolved in alcohol, but could not be obtained in a crystalline state.

The filtrate obtained by precipitating with alum solution was likewise bitter, and on being concentrated changed to ruby-red and separated crystals of alum; a blackish, semi-fluid, bitter substance was likewise separated, which was insoluble in ether, carbon bisulphide and petroleum benzin, but dissolved in alcohol and warm water. It was not obtained in a crystallized state.

On mixing the tincture of the rhizome of podophyllum with ether a dark-coloured mass separated, which had a very bitter taste, but contained sugar, as indicated by Trommer's test.

* From the *American Journal of Pharmacy*, vol. vii., p. 548, November, 1877.

THE MANUFACTURE OF EXTRACTUM CARNIS.

According to a report by Mr. Consul Munro, on the trade and commerce of Monte Video, the establishments upon the River Uruguay for making the "extractum carnis," and the general conversion of cattle and sheep with their skins and offal into money, produce items of increasing consequence in the list of exportation. For instance, the Liebig's Extractum Carnis works at Fray Bentos have exported in twelve months 16,500 tons of animal produce, representing a value of upwards 2,000,000 dollars, shipped in thirty-five vessels, and another establishment, on more or less the same principle, belonging to Don Incas Herrera, has shipped to the value of 470,000 dollars. There are other works also in the same line, but Mr. Consul Munro has not been able to obtain a report of their exports.

Another application of meat, smoked, and made into what is called "charque dulce," has been tried, and has been shipped in small quantities for the west coast; the success and value of the experiment has yet to be decided.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 1, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal. MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE RIGHT TO PRESCRIBE.

THE inconclusive position in which the case between the Apothecaries' Company and chemists and druggists has been left by the result arrived at by the judges before whom the hearing of the appeal came on last week must, we think, be so far a matter of regret to all concerned, that it necessarily postpones for some considerable period the settlement of a question having much importance for the public, no less than for the contending parties.

In order that our readers might be fully informed in respect to what took place in the Court of Appeal, we have considered it desirable to give a full report of the proceedings, which will be found on a subsequent page, and though it would be premature now to enter upon any minute discussion of the points at issue we venture to suggest that the remarks of the judges point to the necessity of considering one aspect of the case in a more extended and thorough manner than was done in the trial at the Nottingham County Court. We refer to the provision of the Apothecaries Act, which provides that it is not to affect chemists and druggists. This section of the Act was evidently held by the judges to be one of very great importance, though they expressed no opinion with regard to its effect, and they considered a new trial in the Superior Court to be requisite for obtaining material upon which to come to a conclusion, whether or not the defendant in the case was entitled to the privilege of that section.

The Lord Chief Baron put the matter very clearly when he said that as regards the making up of prescriptions and vending medicines across the counter the chemist and druggist has power to act as an apothecary, and whether or not he has an apothecary's certificate, so far at least he may act as an apothecary. But the question at issue involved something more than merely selling drugs or medicines across the counter, viz., the fact of his being consulted and giving something to a man who tells him that he has a pain in his chest or a sore throat, and is thereupon supplied with medicine by the chemist and druggist. If, said the Lord Chief Baron, it can be shown that this is also within the privilege of a chemist and druggist, although it may be within the privilege of an apothecary, it could not be held that the defendant in this case was liable.

By reference to the report of the proceedings it will be seen that this point was repeatedly brought forward in connection with the twenty-eighth section of the Apothecaries Act, and as such prominent importance has thus been given to the scope and bearing of this section we think it desirable to quote its exact words, which are as follows:—

"Provided always, and be it further enacted, That nothing in this Act contained shall extend, or be construed to extend, to prejudice or in any way to affect the Trade or Business of a Chemist and Druggist, in the *buying, preparing, compounding, dispensing,* and *vending Drugs, Medicines, and Medicinable Compounds,* wholesale and retail; but all Persons using or exercising the said Trade or Business, or who *shall or may hereafter use or exercise the same,* shall, and may use, exercise, and carry on the same Trade or Business in such Manner, and *as fully and amply to all Intents and Purposes, as the same Trade or Business was used, exercised, or carried on by Chemists and Druggists before the passing of this Act.*"

The italics are our own, and we may add that the wording of the section is remarkable inasmuch as it appears to draw a distinction between "compounding" and "dispensing." The reservation of rights, moreover, is not limited to those chemists and druggists who had exercised their business prior to the passing of the Act, but is extended to all who may thereafter exercise that business and it secures to them the future right to do so as fully and amply as had been done before the passing of the Act.

The decision of the question raised by the Apothecaries' Company appears, therefore, to turn very much upon the evidence which it may be possible to produce as to the habitual practice of the chemist and druggist prior to 1815.

With these remarks we leave the more immediate point in dispute, and will pass on to consider some other points which have already been referred to in these pages on several occasions, with the object of showing that the present action of the Apothecaries' Company, under the instigation of the Medical Defence Association, is ill-advised and more likely to lead to an extension of the counter-practice which they deprecate than to promote that good feeling between medical practitioners and pharmacists which might safely be looked to as a means of mitigating grievances on both sides.

In the first place it appears to us that, even setting aside the exemption of the rights of chemists and druggists by the 28th section of the Apothecaries Act, there is in the attempt of the apothecaries to claim a prescriptive right to the practice of medicine too much disregard of the history of the class to which they belong. The Act of 1815, upon which they rest in the present crusade against chemists and druggists does not in any part of it confer upon the apothecary the right to practise medicine; the very utmost that it does express in that direction is—

"That from and after the First Day of *August*, One thousand eight hundred and fifteen, it shall not be lawful for any Person or Persons (except Persons already in Practice as such) to practise as an Apothecary in any Part of *England* or *Wales*, unless he or they shall have been examined by the said Court of Examiners, or the major Part of them, and have received a Certificate of his or their being duly qualified to practise as such from the said Court of Examiners or the major Part of them as aforesaid, who are hereby authorized and required to examine all Persons and Persons applying to them, for the Purpose of ascertaining the Skill and Abilities of such Person or Persons in the Science and Practice of Medicine, and his or their Fitness and Qualification to practise as an Apothecary."

And if we inquire what were the recognized functions of the apothecary prior to 1815 little will be found to justify his modern representative in putting himself forward to repress what he regards as the improper if not illegal practice of medicine. In fact the position of the apothecary prior to that period, in regard to the practice of medicine, was merely one of encroachment upon the province of the recognized medical practitioner. We need not go further than the Act which the apothecaries now seek to make an engine of oppression to learn what were the recognized duties and functions of the apothecary. They are amply set forth in the fifth section, as follows:—

"And whereas it is the Duty of every Person useing or exercising the Art and Mystery of an Apothecary, to prepare with Exactness, and to dispense such Medicines as may be directed for the Sick by any Physician lawfully licensed to practise Physic by the President and Commonalty of the Faculty of Physic in *London*, or by either of the two Universities of *Oxford* or *Cambridge*; therefore, for the further Protection, Security, and Benefit of His Majesty's Subjects, and for the better Regulations of the Practice of Physic throughout *England* and *Wales*, be it enacted, That if any Person using or exercising the Art and Mystery of an Apothecary, shall at any Time knowingly, wilfully, and contumaciously refuse to make, mix, compound, prepare, give, apply, or administer, or any way to sell, set on Sale, put forth, or put to Sale to any Person or Persons whatever, any Medicines, compound Medicines, or medicinable Compositions, or shall deliberately or negligently, falsely, unfaithfully, fraudulently, or unduly make, mix, compound, prepare, give, apply or administer, or any way sell, set on Sale, put forth, or put to Sale to any Person or Persons whatever, any Medicines, Compound Medicines, or Medicinable Compositions as directed by any Prescription, Order, or Receipt, signed with the Initials in his own Hand-writing, of any Physician so lawfully licensed to practise Physic, such Person or Persons so offending shall," etc.

Here is not a word of the practice of medicine, neither is there anything more, if there be so much as is specified in the twenty-eighth section as being comprised in the exercise of the business of a chemist and druggist, and even the function of dispensing medicines for the sick is mentioned as belonging to the apothecary only under the condition that such medicines were directed by a physician lawfully licensed to practise physic.

We do not pretend to question the fact that prior to 1815 apothecaries did practise medicine, as no doubt many chemists and druggists did, but they did so without any special privilege, with no greater right to do so than appertains to any other persons or class of persons, and by the recognized medical practitioners of the day they were not only looked upon as interlopers, but were actually prosecuted for so doing by the College of Physicians. In fact, the apothecary of that time was merely the chemist and druggist of the present, and the Act by which he was slipped into the position of a qualified medical practitioner upon condition of his passing an examination for the purpose of ascertaining his skill and ability in the science and practice of medicine was passed, not as protection of his rights, but in the interests of the public, as a means of furnishing greater facilities for obtaining medical relief.

At the present time the apothecaries having abandoned the practice of all those duties and functions which originally belonged to them, and having exclusively developed the medical branch of the business they carried on prior to 1815, are now seeking to assume, in regard to the chemist and druggist, the position of the physicians who then endeavoured to prevent apothecaries from practising medicine. There is an exact parallel between the two cases and we should not be surprised to see that parallel become still closer. The decision of the contest between the physician and the extinct apothecary was made conducive to the public interest; is there any reason to expect that interest will be disregarded in the present contest between the modern apothecary and the chemist and druggist?

Whatever may be the result arrived at, however, we think it right to say that the Pharmaceutical Society as a body has always sought to develop the opinion that the business of the pharmacist should not comprise the prescribing of medicine; this, however, is a matter of principle and of ethics, quite apart from the question as to rights and privileges, and since the right to practise medicine is not barred even by the Medical Act, we cannot perceive that the chemist and druggist is less entitled to do so, if he pleases, than any other member of the community.

THE EVENING MEETING.

The next Evening Meeting of the Pharmaceutical Society will be held at 17, Bloomsbury Square, on Wednesday, December 5th, when the following papers will be read:—"The Colour of Podophyllum Resin," by Dr. A. SENIER, F.C.S., and Mr. A. J. G. LOWE; "*Rheum officinale* Root grown in England," by Mr. HAROLD SENIER, F.C.S.; "False Angostura Bark and Strychnia," by Mr. W. A. SHENSTONE, F.C.S.; and "Nitrite of Ethyl," by Mr. JOHN WILLIAMS, F.C.S. The Chair will be taken at half-past eight o'clock precisely.

DEATH OF AN ANNUITANT.

WE regret to have to announce the death of another annuitant on the Benevolent Fund of the Pharmaceutical Society in the person of Mrs. SOPHIA PEDLEY HENSON, who was elected in 1872. Mrs. HENSON is the fourth annuitant who has died during the present year, and the second since the election last month.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A MEETING of the above Association will be held at 17, Bloomsbury Square, on Thursday evening, December 6, when a paper will be read by Mr. R. H. PARKER on "Coal Gas; its History and Manufacture." The Chair at eight o'clock.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The second general meeting was held in the lecture theatre of the Royal Institution, October 26, 1877; the President, Mr. T. Fell Abraham, in the chair.

The minutes of the previous meeting were read and confirmed.

Messrs. W. H. Leatham and B. Adams were unanimously elected members. After some miscellaneous communications, Mr. Edward Davies, F.C.S., read a paper on "The Influence of the Nascent State on Chemical Action." The paper was listened to with a considerable interest, and numerous experiments were performed to illustrate the subject. At the close the President expressed his high appreciation of Mr. Davies' able lecture. The lecture will be printed in an early number of this Journal.

Dr. Symes endorsed the President's remarks upon the lecture and moved a vote of thanks to Mr. Davies for his very interesting and able paper. The motion was seconded by Mr. Haddock, and being put to the meeting was carried by acclamation. The attendance of ladies had been invited and several were present on the occasion.

The third general meeting was held at the Royal Institution, November 8, 1877. The President, Mr. T. Fell Abraham, in the chair.

The minutes of the previous meeting were read and signed.

Various donations to the library and museum were announced, and a vote of thanks accorded the donors.

Mr. T. H. Melmore was duly elected a member, and Mr. Capper, jun., an associate.

The President called attention to the approaching associated science and art soirée to be held in St. George's Hall, on December 14, the arrangements for which were under the control of an executive committee, and the Association represented by its President.

Mr. John Abraham having made the sign ℥ on the black board, said he supposed that most of the company were acquainted with it. As long as he could remember, and he believed for ages before, it signified 480 grains, but by a correspondence in the *Pharmaceutical Journal* he found that some persons supposed that it now represented 437½ grains. He thought it was to be regretted that any doubt or difference of opinion should prevail as to its precise significance. The United States Pharmacopœia defined it as a troy ounce, which is 480 grains. The British Pharmacopœia did not mention it, but uses the avoirdupois ounce of 437½ grains, and applies to that the sign oz. He had no reason to think that the old sign had changed its meaning, and did not know of any authority for supposing that it had.

Dr. Symes said, as the writer of one of the letters in the Journal, he felt bound to defend the position he had taken. The sign ℥ was every day used to represent an avoirdupois ounce. The writer of the article called "The Month," who gave rise to this discussion by first recommending that where the sign ℥ was written an apothecaries' ounce should be used, also stated a few paragraphs further on that the "British Pharmacopœia gave a formula for belladonna ointment 80 grains of the extract to ℥j of lard." Here obviously he used this sign to represent 437½ grains. To retain the apothecaries' ounce would tend to destroy the uniformity which the British Pharmacopœia had endeavoured to establish, and that merely for the sake of retaining an old custom and a weight that had practically become obsolete.

Mr. A. H. Mason, F.C.S., called attention to the statement in the *Lancet*, that a quantity of adulterated morphia was being offered for sale in London. He said the investigation published in the *Pharmaceutical Journal* of the preceding Saturday would show that there was not much ground for the statement, which he believed had probably arisen from the fact, that a German agent in London had shipped a large quantity of morphia to Japan. This was found to be adulterated with 30 per cent. of sulphate of soda, and was consequently not passed by the authorities. It was returned to England and offered for sale on the market, but as the whole was purchased by a manufacturer and reworked, it is not probable that medical men have anything to fear.

A paper was then read on "Antiseptics and Disinfectants," by Mr. A. H. Mason, F.C.S.

At the close of the paper, a lengthy discussion took place in which the President, Messrs. Abraham, Armstrong, Jones, Tanner, Drs. Hall and Symes, and others took part. On the motion of Dr. Symes, seconded by Mr. J. T. Armsrong, F.C.S., a cordial vote of thanks was given to Mr. Mason for his paper.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

The quarterly meeting of this Association was held at Burlington Chambers, New Street, on Friday, November 16th; the President, Mr. W. Jones, in the chair. There was a good attendance of members and associates.

Mr. Dewson was called upon to read the quarterly *résumé* of pharmaceutical news. Some discussion ensued and doubts were expressed whether for sweet nitre the spt. ætheris nitrosi of B. P. strength must necessarily be sold; the question was decided, however, in the affirmative.

The President then called upon Mr. H. W. Jones for his paper on "Some Remedies Recently Introduced."

The following remedies among others were referred to:—

Acid. Hydrobromic. Dil.—This was stated to be a somewhat unsatisfactory preparation when made according to the original formula of Dr. Wade, as it invariably deposits on keeping. A better process was that of C. Rice, which had appeared in *New Remedies*, in which alcohol was added to precipitate more completely the acid tartrate of potash, the alcohol being afterwards removed by distillation and the acid brought to the s p. gr. of 1·075, containing 10 per cent. of HBr. The sample exhibited had been made from recently distilled acid, prepared by the action of bromine upon phosphorus, the portion being used that distilled over nearly colourless. It was remarked that a perfectly colourless acid could be easily prepared from the distilled acid, and when the strong acid had become discoloured it could be decolorized by a little sulphuretted hydrogen; heat would remove excess of gas, and filtration the deposited sulphur.

Liq. Ferri Dialysat.—The sample shown had been from 300 parts of liq. ferri perchlor., and 100 parts of liq. ammoniæ, of sp. gr. ·92, as proposed by Dragendorff. Highly basic chlorides of iron had been prepared previous to 1861, when Graham obtained a solution containing ninety-five molecules of oxide to one molecule of chloride; a solution containing the oxide in this proportion, as that experimentalist had shown, would not keep, so that for pharmaceutical purposes a decided, though relatively small amount of chloride would have to be present; this, however, should not be looked upon as an excuse for using a bad preparation, or such a solution as would, without the iron being first precipitated, show the presence of a chloride with a solution of silver.

Salicylic Acid, although classed among the less recently introduced articles, was noted from its important uses in medicines. The three kinds were shown; the precipitated acid, the crystalline, and the acid chemically pure obtained by dialysis.

Guarana.—Specimens were shown in the roll and in the powder. A number of specimens had been examined by the speaker, but none found adulterated. In one case, a number of minute metallic fragments were visible by means of a lens, which on examination proved to be metallic lead; the total amount was small, and its presence seemed to be accidental, and not added with a view to adulterate. This sample was in fine powder, not in rolls, as usually imported.

Monobromated Camphor was then exhibited, and the mode of manufacture explained, and the dispensing difficulty was referred to. The speaker thought that an *emulsion syrup* could be prepared by dissolving the camphor compound in spirit, precipitating with water, collecting the finely divided monobromide, and mixing it with cold syrup. By this means a sort of emulsion could be made, and although it separated, the camphor compound floating to the surface, still it could readily be diffused again by shaking.

In treating of *chrysophanic acid*, it was said that, whilst the method of heating was greatly to be preferred to the use of benzine in making an ointment, still a smooth ointment was not obtained by dissolving the acid in the hot fat, but by rubbing down after cooling a satisfactory preparation resulted.

Nitrate of Bismuth and its Glycerole and a few other references brought the paper to a close.

Mr Dewson then explained a ready method by which the absence of alum as an adulterant of cream of tartar can be ascertained. He said that since alum, if present as an adulterant, is always found in considerable quantity, it could be detected by the simple process of agitating forty grains of the cream of tartar with ℥iij of cold distilled water, filtering off the fluid, and evaporating it to dryness. In consequence of the sparing solubility of the acid tartrate, the dry residue will weigh less than one grain if the cream of tartar be free from this adulterant, but much more* if it be present; thus, if the residue weigh less than one grain, the absence of soluble salts as *adulterants* may be inferred, though they may be present in small quantities as impurities.

A vote of thanks to Mr. H. W. Jones, for his interesting paper, brought the meeting to a close.

* This residue of course being examined for alumina.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

Assistants' Section.

The opening meeting of the session, 1877–8, of the above Association was held in Anderson's College, on Wednesday, 14th ult.; Mr. Peter Boa, President, in the chair.

After the minutes of last meeting were read and confirmed,

The President read a letter from Mr. J. S. Whyte, Secretary, intimating that he could no longer hold office on account of his having left the city.

On the motion of Mr. W. Simpson, seconded by Mr. McLeish, Mr. W. Paris was unanimously elected to the office for the session.

The President, in a few introductory remarks, said that he hoped the session now opened would be a successful one, and that all that was required to make it so was in the power of the members to give, viz., good attendance at the meetings and a few useful papers; good audiences and useful papers reciprocally encouraged each other.

The President then read a paper on "Salicylic Acid." He described the method of its manufacture by Kolbe's process, and explained, by equations, the reactions that take place in the several stages, and showed its relation to carbolic and benzoic acids and salicin. He also explained the old method of obtaining the acid from wintergreen oil. Referring to its use in preserving infusions he said that concentrated infusions might as well be used as infusions preserved by it, and that if they were to be used at all they ought to be freshly made. For the suspension of the acid in water, powdered tragacanth answered admirably. Pills could also be formed with the acid and tragacanth, using a small quantity of glycerine, but, owing to the solvent power of glycerine on the acid, excess should be carefully avoided.

After some remarks by a few of the members, a hearty vote of thanks was awarded to Mr. Boa for his instructive paper.

Mr. Simpson then read the report of the Early Closing Committee, which showed that their efforts to obtain a reduction of the hours of Sunday had been only partially successful.

The Secretary intimated that he had received a communication from Mr. Fairlie regarding the classes, stating that a few more members were required to make it worth while for the teachers to carry them on, and recommended all who were intending to go in for examination to take advantage of them.

Mr. Boa intimated that being about to leave Glasgow he would require to resign the office of President. It was agreed to accept his resignation, and appoint a successor at the next meeting.

After a few new members were enrolled, the meeting was brought to a close.

CHEMISTS AND DRUGGISTS' TRADE ASSOCIATION.

A meeting of Executive Committee of the above Association was held at the office of the Association, 23, Burlington Chambers, New Street, Birmingham, on November 26th, 1877, at 1 p.m. Mr. S. U. Jones (Leamington), President.

After the usual formal business, the report of the Law Committee, and that of the Finance Committee were received and adopted.

A discussion then followed upon the bearing of the decision in the appeal in the case of the Apothecaries' Company *v.* Shepperley, a full report of which proceedings will be found on the following pages.

Mr. Greenish inquired if the Solicitor knew of any persons able and willing to give evidence as to the practice of chemists and druggists prior to the passing of the Apothecaries Act in 1815.

The Solicitor said four or five gentlemen were willing to give evidence as to the custom of the trade before, or about, 1815. It would be well to seek for additions, but no doubt others would come forward before the new trial, and volunteer evidence. He further said, in reply to questions, that he had written to the clerk of the Apothecaries' Company several months since, requesting him to refrain from taking proceedings against other chemists and druggists until the case of the Apothecaries' Company *v.* Shepperley had been decided. The reply he received was to the effect that the Apothecaries' Company would give no such undertaking, each case stood on its own merits.

Mr. Southall said, that in his opinion, there was no doubt the county court judges would postpone the decision in any case coming before them under the Apothecaries Act, pending the new trial in Shepperley's case.

The Solicitor was instructed to take all necessary steps to obtain a definite decision in the Apothecaries' Company *v.* Shepperley.

The Secretary inquired if he should cause a report of the appeal to be printed and circulated to the trade, and whether he might pledge the Association to fight the case through the highest possible tribunals.

The President said the Secretary might so pledge the Association, and in his opinion a report of the case should be printed and circulated to the trade.

The Secretary was also instructed to prepare a circular, appealing to the trade for support in deciding the question; to be forwarded with a report of the hearing of the case to each chemist and druggist named in Kelly's 'Chemists' Directory.'

A report of the proceedings of the Scotch Committee was read by Mr. Fairlie, and it was decided on the recommendation of that committee to postpone the whole of the elections of the general committee for England, Wales, and Scotland, until March, 1878.

Moved by Mr. Greenish, seconded by Mr. Shaw, and unanimously resolved:—"That Mr. James Colquhoun (of the firm of Messrs. H. J. and D. T. Colquhoun), 158, St. Vincent Street, Glasgow, be appointed solicitor to the Scotch Branch of the Association."

Some considerable discussion took place on sections 14 and 15 of "The Sale of Food and Drugs Act, 1875." The Secretary said that as a rule chemists refused to accept the duly sealed official sample of articles purchased by inspectors appointed under the Act, and that on more than one occasion the Association had been put to considerable expense in endeavouring to obtain sealed samples from the authorities after proceedings had been commenced for alleged adulteration of articles sold; it would be advisable to take steps to so amend the 14th section that it should be compulsory for the official making the purchase to leave a third portion duly sealed in the hands of the vendor.

A resolution was passed to the effect that such an amendment of the Act was desirable, and the subject was referred to the Law Committee with instructions to take action when a suitable occasion shall arise.

It was resolved that the second annual general meeting of the Association should be held in London, on the third Tuesday in May, 1878.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of this Association was held at 17, Bloomsbury Square, on Thurday, November 22, when a paper was read by the Secretary, Mr. H. G. Greenish, on "The Microscope and its Application in Pharmacy." The author having first alluded to the simple microscope consisting of a single lens, and to its convergent effect upon rays of light, proceeded to describe the compound microscope and the lenses of which it was composed, showing their effect upon rays of light reflected from an object. He next directed his remarks to the use that might be made of the microscope in pharmacy, first noticing the starches and the means by which starches from different plants might be distinguished from each other. Vegetable histology was the next branch, and the importance of the microscope was here illustrated by sections of roots exhibited under the microscope, notably aconite and the root sometimes found mixed with it—imperatoria or masterwort. Brief allusion was also made to the importance of a knowledge of this branch of the subject in cases of poisoning by vegetable substances. Micro-sublimation received some attention, being well illustrated by the tea-leaf, from a fragment of which a sublimate of theine could easily be obtained. The few instruments for microscopic manipulation required by the pharmacist were next described, and the author concluded with some practical remarks on the choice of a student's microscope.

The paper gave rise to a considerable discussion, and a vote of thanks unanimously awarded to the author.

Parliamentary and Law Proceedings.

Apothecaries' Society *v.* Shepperley.

The hearing of this case was resumed on Friday, November 22nd, before the Lord Chief Baron Kelly and Mr. Baron Cleasby.

Sir Henry James: I remind your Lordships that the question turns upon the construction of the 20th section of 55 George III., chapter 194, and then when your Lordships determine what is the proper construction to be put upon that section, whether the facts of the case and the notes of the learned county court judge bring the appellant within that section. My Lords, I remind you that the words of the section are—

"That if any person shall act or practise as an apothecary in any part of England or Wales without a certificate he shall be liable to a penalty."

The Lord Chief Baron: Yes.

Sir Henry James: I have to ask your Lordships to be good enough to consider, first, what is the meaning of "acting or practising as an apothecary," and when that is determined, probably the duty of applying that determination to the facts of this case will not be so very difficult. My contention in relation to the words "acting or practising as an apothecary" substantially is, that a person to act or practise as an apothecary must not only do some particular act identical with one that an apothecary does, but that in substance the person complained of must hold himself out, and in fact act as an apothecary, substantially performing the same acts that an apothecary in the course of the practice of his profession does. Now, my Lords, to determine whether there has been any acting or practising as an apothecary, in the sense which I submit to you the words should be used, it is necessary, first of all, very shortly to consider what an apothecary is, and to trace how an apothecary has sprung into an existence, both at the time when this Act was passed, and also to see what an apothecary is now that this Act (almost obsolete, as, I think, I can show your Lordships) is sought to be put in force. An apothecary appears to have been originally a mere shopkeeper, and at the time when the physician's existence in the art of surgery was first recognized by the charter of the 10th of Henry VIII., probably an apothecary was unknown as a person who required to possess any skill in relation to the art of medicine. Perhaps, my Lords, I may give to you the date of the charter—the 10th Henry VIII. The 10th of Henry VIII. seems to have been the first recognition, at least as far as I know, of the existence of any persons practising medicine in requiring skill in relation to its practice, and that charter is set out and is confirmed by the statute of 14 and 15 Henry VIII., cap. 5. No doubt that charter and that statute were intended only to apply to physicians and surgeons. The words are general. They protect all persons who shall exercise medicine; but there is no doubt that at that time the persons intended to be protected were physicians, and it may be, surgeons. I cannot find the charter in which the Royal College of Surgeons exists as distinct from the charter of the College of Physicians, but the persons who at that time were apothecaries were persons simply who carried on their business in shops, and probably, my Lords, found a common business with grocery; but without doubt the apothecary never attended any patient—never brought to bear any skill in relation to the art and practice of medicine, and was a mere dispenser in the sense of a seller of drugs. Now, my Lords, by degrees that position of an apothecary became altered, and in the reign of 6 James I. there was a charter which is recited in the case before your Lordships—the Act of 55 Geo. III.

The Lord Chief Baron: What is the chapter?

Sir Henry James: The chapter, my Lord, is 194. The charter is recited in the preamble to the Act, and your Lordships see there that reciting charter 6 of King James I. In that charter the apothecaries are spoken of in these terms:—

"And to all and singular other persons whomsoever, brought up and skilful in the art, mystery, or faculty of apothecaries, and exercising the same art, mystery, or faculty, then being freemen of the mystery of grocers of the city of London, or being freeman of any other art, mystery, or faculty, in the said city of London."

And what appears by that charter to have been its object is that they should be subject to supervision and that certain persons should have power to inquire into the nature of the drugs and wares sold by persons who, no doubt at that time, were so selling them in shops as a grocer would sell his wares. Now, my Lords, that was the condition of things in the time of James I., but an apothecary from that time—and probably before that time—must have been growing into a person who required to show skill in his profession, and was a person, no doubt, at that time, to some extent other than a grocer or a seller of wares and drugs, because in the 6 and 7 William III., cap. 4, it recites that—

"Whereas, the art of the apothecary is of great and general use and benefit by reason of their constant and necessary assistance to His Majesty's subjects which should oblige them solely to attend the duty of their professions, yet by reason that they are compelled to serve several parish wards and leet offices in the places where they live and are frequently summoned to serve on juries in inquests, which take up great part of their time, they cannot perform the trust reposed in them as they ought, nor attend the sick with such diligence as is required; and whereas King James I., by his letters patents under the great seal of England, did incorporate the apothecaries exercising that art within London and seven miles compass by the name of the Master, Wardens, and Society of the Art and Mystery of the Apothecaries of the City of London. Be it therefore enacted: That apothecaries shall be exempt from," performing certain duties—attending juries, ward courts, and so forth.

The exemptions are set out in sections 2 and 3 of the Act. The point is that apothecaries must have had duties other (at that time) than those of mere sellers of wares in shops as shown and recited in that statute; but, my Lord, still their position was undefined as to whether they were entitled as against physicians and surgeons to practise the art of medicine, and the point was raised in a case of Rose against the College of Physicians, which is reported in 6 'Modern Reports,' p. 44. An action was brought upon the statute to which I have referred your Lordships—the physicians' statute, 14 and 15 Henry VIII.—"for practising physic within seven miles of London without licence."

The Lord Chief Baron: Practising as a physician?

Sir Henry James: No, practising physic, which, my Lord, would no doubt include both a surgeon's and a physician's practice. The words here are "practising physic;" "for practising physic within seven miles of London without licence. The case upon a special verdict was that the defendant being an apothecary by trade was sent to by John Scale, then sick of a certain distemper, and he, having seen and being informed of the said distemper did, without prescription or advice of a doctor, and without any fee advise, compound, and send to the said John Scale several parcels of physic as proper for his said distemper, only taking the price of his drugs. The question was whether this is a practising of physic such as is prohibited by the statute, and after several arguments the Court at last unanimously agreed that practising of physic within this statute consists, first, in judging of the disease and its nature from the constitution of the patient, and many other circumstances; secondly, in judging of the fittest and properest remedy for the disease; thirdly, in directing or ordering the application of the remedy to the disease, and that the proper business of an apothecary is to make, compound, or prepare the prescriptions of the doctor pursuant to his directions, and it was agreed that the defendant, taking upon himself to send physic to a patient as proper for his distemper without taking aught for his pains, is plainly taking upon himself to judge of the disease and fitness of remedy, as also the executive or directing part;" and the plaintiff had judgment. But, my Lord, that judgment was wrong, because in 5 Brown's 'Cases in Parliament,' p. 553, that judgment is overruled. I am sorry that no light is thrown upon the reason of the judgment in the House of Lords. As is usual in these reports, the arguments of counsel are always given as if they were important, but the judgment of the Court is treated with apparent contempt, because it simply says that the arguments being given the House of Lords reversed the judgment.

The Lord Chief Baron: What was the decision that was afterwards overruled?

Sir Henry James; My Lord, the decision was overruled.

The Lord Chief Baron: What was the decision?

Sir Henry James: The decision is that which I have just read to you.

The Lord Chief Baron: Yes, you have read the special verdict, but what I did not catch was the decision.

Sir Henry James: The decision was for the plaintiff, my Lord. That was under the statute of the 14th and 15th Henry VIII.

The Lord Chief Baron: That he had practised as a physician?

Sir Henry James: He had practised physic.

The Lord Chief Baron: As a physician I think you said. It must be.

Sir Henry James: My Lord, the decision in the Court below, as reported 6 'Modern,' was that upon the action brought to recover penalties within the 14th and 15th Henry VIII. The practice I have read to your Lordships was the practising of physic within seven miles of London, which rendered the defendant liable to penalties.

The Lord Chief Baron: The practising of physic?

Sir Henry James: The "practising of physic" are the words of the charter. The words are very general.

The Lord Chief Baron: And the judgment was for the plaintiff—that he had practised physic?

Sir Henry James: That the defendant had.

The Lord Chief Baron: That the defendant, who was an apothecary, had practised physic?

Sir Henry James: Yes, my Lord.

The Lord Chief Baron: In other words, I suppose he had done the business of a physician.

Sir Henry James: Yes, it is upon the special facts. He had attended at the house of the patient, he had been sent for to the house of the patient, and then, having examined him, no doubt he had returned to his own shop, which was at that time, an apothecary's, and sent him drugs and charged for those drugs; then your Lordship will recollect the three resolutions that the Court arrived at, as to what constituted a practice of physic.

The Lord Chief Baron: Very well, and that was overruled.

Sir Henry James: Then, my Lord, the whole report is, that after hearing counsel on this writ of error, the judgment being set out at great length, it was ordered and adjudged that the judgment given in the Queen's Bench for the President and College or Commonalty of the Faculty of Physic, London, against the said William Rose, should be reserved.

The Lord Chief Baron: Does not the report in Brown give you the arguments or show what the points were?

Sir Henry James: Yes, my Lord, it gives the whole of the arguments.

The Lord Chief Baron: You say it gives no reason.

Sir Henry James: It gives the arguments of counsel, but they do not seem to me to touch the point at all, my Lord.

The Lord Chief Baron: That may be; but you say the judgment which overrules the judgment of the Queen's Bench gives no reasons.

Sir Henry James: No, my Lord; none.

The Lord Chief Baron: Well, if it be necessary we must refer to the case and see if we cannot collect what must have been the reasons from the arguments and the points made. However, there it is.

Sir Henry James: I think the case in 6 'Modern' did show something of the principle on which the Court there proceeded. I have read these arguments and I will read them to your Lordships if you like, but they do not seem to me to be much to the point.

The Lord Chief Baron: I do not wish anything to be read that you do not wish to bring under the attention of the Court.

Sir Henry James: The argument, my Lord, is stated to be this—first, the facts are set out as set out in 'Modern'—"The plaintiff, who was an apothecary and freeman of London, attended one Scale, a butcher, in the parish of St. Martin-in-the-Fields, and made up and administered proper medicines to him but without any licence from the faculty, and also without the direction of any physician, and without taking or demanding any fee for his advice. The defendants, apprehending this conduct to be an infringement of their privileges, brought their action against the plaintiff to recover the penalty of £5 per month, under the above clause in their charter, and on the trial the jury found a special verdict, stating the charter, the confirmatory statute, and the facts of the case, and submitted to the Court whether the defendant Rose did practise physic within the intent of the letters patent and Act of Parliament. And after this verdict had been three several times argued in the Court of Queen's Bench, the judges were unanimously of opinion that the facts found did amount to the practising of physic within the meaning of the Acts of Parliament, and gave judgment accordingly. Hereupon a writ of error in Parliament was brought to reverse this judgment, and on behalf of the plaintiff in error it was argued that the consequences of it would not only ruin him but all other apothecaries, as in case of the affirmance of this judgment they could not exercise their profession without the licence of a physician, that the constant usage and practise which had always been that the apothecary was conceived to be the best expounder of this charter, and that therefore the selling a few lozenges or a small electuary to any person asking a remedy for a cold, or any other ordinary or common case where the medicines had a known and certain effect, could not be deemed unlawful, or practising as a physician when no fee was taken or demanded for the same; that the physicians by straining an Act made so long ago endeavoured to monopolise all manner of physic solely to themselves, and if they should succeed in this attempt it would be attended with many mischievous consequences; for in the first place, it would be laying a heavy tax on the nobility and gentry, who in the slightest cases, and even for their common servants, could not have any kind of medicine without consulting and giving a fee to a member of the college; it would also be a great oppression upon poor families, who, not being able to bear the charge of a fee, would be deprived of all kind of assistance in their necessities, and it would prove extremely prejudicial to all sick persons who, in case of sudden accidents or new symptons happening in the night time, generally send for the apothecary" [your Lordships see the weight of these arguments I think] "but who should not dare to apply the least remedy without running the hazard of being ruined." [These are Mr. Brown's own arguments.] "On the other side it was contended that by several orders of the college its members were enjoined to give their advice to the poor gratis, and that not only to such as could come to them for it, but every physician in his neighbourhood was obliged to visit the sick poor at their own lodgings, and therefore the objection that if the apothecaries could not administer physic, but by the prescript of a physician, the poorer sort of people would be lost for want of proper remedies, had not the slightest foundation. And when these orders were observed not to have their full intended effect, on account of the high prices which the apothecaries generally demanded for the remedies prescribed, whereby the poor were deterred from consulting the physician for fear of the charge of the physic, the college, by a joint stock, erected several dispensaries in town, where after the physicians had given their advice gratis the patients might have the physic prescribed for a third, and generally less, of what the apothecaries used to exact for it."

Your Lordships wished me to read the arguments, but they are all of this general nature. They do not seem to me to touch any point that is before your Lordships now; they were put forward apparently as popular arguments. That is the whole gist really of what is stated here, on what is the policy of the Act rather than any question of construction upon the charter. Mr. Rose by that judgment certainly established this right, that apothecaries under the charter of James I. had a right to attend patients, in the sense in which we use the term now, at their own houses, bringing skill to bear upon the diseases from which those patients were suffering, and, my Lords, that seems to have been in addition to and distinct from what had been the primary office of an apothecary, viz., making up, dispensing, and selling the prescription that the physician wrote. That portion of the apothecary's duty, your Lordships see, is pointed out very fully in the 5th section of the Act which we are discussing—the Act of George III.—

"And whereas it is the duty of every person using or exercising the art and mystery of an apothecary, to prepare with exactness and to dispense such medicines as may be directed for the sick by any physician lawfully licensed to practise by the President and Commonalty of the Faculty of Physic in London."

Then the offence is created in these words:—"That if any person using or exercising the art and mystery of an apothecary shall at any time knowingly, wilfully, and contumaciously, refuse to make, mix, compound," and so forth, then he shall be liable to a penalty. You see that even in 1815, so far as that section is concerned, the duty of an apothecary, and the only duty mentioned in that section, is, that of compounding medicines which a physician may prescribe; but, my Lords, it is clear that those duties there set out were not the only duties that an apothecary in the practice of his profession would fulfil. My Lords, there is a case reported in 4 'Barnewell and Adolphus,' page 625, a case of the Apothecaries' Company against Allen. I shall have to refer to it again, but I quote it at this moment for the dictum of Justice Park, afterwards Lord Wensleydale. Mr. Justice Park was then sitting in the Court of Queen's Bench. He says this: "The preamble to section 5 does not profess to recite all the duties of an apothecary, but only those referred to by the penal enactments which follow." So your Lordships see that although in 1815 it was contemplated that an apothecary was a person who did make up and sell without bringing to bear any skill upon the subject, the prescriptions which the physician wrote, yet no doubt at that time the apothecary had grown into existence as a profession. The apothecary's profession existed where skill other than that of selling medicine is required. Now, my Lords, of course practically, as your Lordships have to determine and apply this Act, now, that portion of an apothecary's business which is mentioned in the 5th section of the Act of 1815 is substantially gone. No apothecary now of course keeps a shop. It may be that, sometimes acting, as I shall show your Lordships when I come to it, under the Pharmacy Act, a person who is also a chemist and druggist may have a diploma from the Apothecaries' Hall, but *quâ* apothecary and apothecary only of course he ceased to carry on business as selling drugs, and I presume, my Lords, the fact is that if anybody were to go with a prescription to a gentleman who was practising as an apothecary now, as a practitioner, and ask him to make up the prescription of any eminent physician he would not do it. If he did do it and did not see the patient he would simply act as a chemist and druggist in making up that prescription, charging the mere price of 2*s.* or 3*s.* 6*d.*, or whatever the price of the drug might be that he was selling.

The Lord Chief Baron: Why?

Sir Henry James: Because they do not do it any more than if you ask a barrister to endorse a writ.

The Lord Chief Baron: You say so; but why, if this statute be unrepealed?

Sir Henry James: I do not know, my Lord, why people do a great many things.

The Lord Chief Baron: But you are making an assertion, as it appear to me.

Sir Henry James: I do make that.

The Lord Chief Baron: You are making the assertion of a fact or usage that if any gentleman were to go with a prescription of Sir William Gull's to an apothecary the apothecary would object to make it up—you state that as a fact—but why?

Sir Henry James: My Lord, I must put it as argument to your Lordship. It is a fact that the making up of the physician's prescription now no doubt falls into the hands of the chemist and druggist.

The Lord Chief Baron: There is no doubt about that, but I want to know why do you say—with this provision in the statute-book as far as I know unrepealed—that if a gentleman who has consulted Sir William Gull and obtained a prescription from him, that then if instead of going in the ordinary way to a mere chemist and druggist he should go to an apothecary and call upon him to make up the medicine prescribed, that he would object to do it. You say that he would not do it. I want to know why?

Sir Henry James: I'll tell your Lordship why I think so; because now the fact is that almost every apothecary has a diploma from the College of Surgeons. Your Lordship sees that the general practitioner who exists now—the apothecary—according to common knowledge, does not exist separately and distinct as an apothecary selling drugs, but he exists as a person bringing skill to bear upon all diseases.

Mr. Baron Cleasby: What you say is true generally, but not universally, I should suggest.

Sir Henry James: Well, I leave it to your Lordships' knowledge. I won't put it to your Lordships as being universal; it may be that it would be done under certain circumstances, but it is not so done. The practice is that an apothecary now practising as a general practitioner in the first place *quâ* apothecary has no shop. In the next place, he does not hold out that it is his business to simply sell the drugs that another person writes on a piece of paper is to be made up, but the apothecary practises as a general practitioner in almost all cases with a diploma from the College of Surgeons and also with a diploma from the Apothecaries' Hall. He is not a seller of drugs, a bare dispenser, he is a person who brings skill to bear in attending his patients; and, my Lords, to show that that is so, as your Lordships are aware, now an apothecary may attend as an apothecary and not charge for any sale of the drug at all. He is entitled to charge for his bare skill and the knowledge of the art and mystery that he brings to bear and not charge for any drug at all. My Lords, that was determined in Town and Lady Gresley, reported in 3 'Carrington and Paine,' page 581; it being an action of assumpsit for work and labour as an apothecary and for medicines furnished. The plaintiff had charged both for medicines and attendance. Serjeant Wild submitted that the charge for attendances must be taken off as an apothecary had no right to make such a charge. Chief Justice Best said, "I am inclined to think that there is something in some of the Acts of Parliament upon the subject of attendances; but if there is not any express provision, yet the practice is so inveterate that I cannot allow the plaintiff to charge in both ways. An apothecary may charge for attendances if he pleases and then the jury will say what is reasonable for those attendances, or he may charge for the medicine he sends, but he cannot be permitted to make a charge for both. I shall recommend the jury in the present case to strike off the charges for attendance and make an allowance for the medicines only."

The Lord Chief Baron: There there is a claim then for attendances and also for the supplying of medicines.

Sir Henry James: Yes, of medicines.

The Lord Chief Baron: Whether in prescriptions or merely his own?

Sir Henry James. My Lord, he seems to have supplied them himself from his own surgery.

The Lord Chief Baron: What Chief Justice Best held was, that he might charge for attendances if he pleased and recover, but he could not charge for attendances and for the medicine supplied pursuant to whatever may have been the necessities of the occasion.

Sir Henry James: Yes, my Lord. There is a note, I quote it as a note of the editor's, but it puts the position of an apothecary somewhat strongly. Perhaps you will allow me to read it. The note to the case is—"This is the first case which has decided that an apothecary may charge for attendances provided he makes no charge for the medicine he furnishes. There has long existed in the profession a vague and undefined notion that an apothecary cannot charge for attendances. This may have arisen from the fact that an apothecary originally was only a compounder of medicines prescribed by a physician. There does not appear to be any express provision in any of the Acts of Parliament upon the subject of attendances, and there is no doubt that the rule laid down by the learned Chief Justice is, in the present state of the medical profession, the most reasonable and the best that could be adopted both for the practitioner and the patient. There are many cases which require both skill and attendance, but which do not require the administering of much medicine, and it is well known in point of fact, that when attendances are not charged for, much more medicine is often sent than the case actually requires, and also that the charge for medicines generally bears no proportion to the cost price of the drugs. By giving the apothecary the option of charging for medicines or attendance, according to the nature of the case, one of those inconveniences will be removed and the other considerably diminished."

The Lord Chief Baron: Does it appear in that case whether the attendances for which part of the claim was made were attendances at the apothecary's own house or his own premises, or did he go out to visit the patient? Does it appear one way or the other?

Sir Henry James: It does not; but I should draw the inference that it is attending at the patient's house, because it says here, "the plaintiff lived near Waterloo Bridge and the defendant in Conduit Street," and the plaintiff had charged for both medicines and attendance, but it does not directly appear.

The Lord Chief Baron: I suppose that is so.

Sir Henry James: I suppose, my Lord, it was probably attending at the house. There are other cases in which they are attended. There is also mention made of an apothecary in the case of Alison against Haydon, reported in 4 'Bingham,' page 619. It was an action of "assumpsit for work and labour as a surgeon and apothecary," with counts for medicines sold and delivered. At the trial it appeared that the plaintiff had a certificate from the College of Surgeons, but none from the Master and Wardens of the Apothecaries' Company. There the defendant disputed certain charges for attending him in a typhus fever; and it was objected that he could not recover for these attendances, the 55 G. III. c. 194, s. 21, having enacted that "no apothecary shall be allowed to recover any charges claimed by him in a Court of Law unless he shall prove at the trial that he was in practice prior to or on the 1st of August 1815, or that he has obtained a certificate from the Court of Examiners by the said Act constituted." There the plaintiff was nonsuited for those charges upon the defendant for attendances upon him and giving him advice in relation to this typhus fever. Chief Justice Best says, "I think this is a useful law, intended to put apothecaries upon a more respectable footing and to exclude low and ignorant persons from the practice of medicine. But the words of the Act prevent all persons from recovering for attendance, except such as have duly qualified themselves as apothecaries." Then the Chief Justice read the section. "No one therefore can recover unless he were practising as an apothecary before 1815 or has a certificate from the Court of Examiners of the Master and Warden of the Apothecaries' Company. If indeed the plaintiff had been practising as a surgeon and had administered medicine as ancillary to a surgical case his claim could not have been resisted, but he was lowering a typhus fever, which is the province of the physician or apothecary." Then, my Lord, although this does not bear upon the express point, the Chief Justice says, "a surgeon formerly was a mere operator who joined his practice to that of a barber. In latter times all that has been changed and the profession has risen into great and deserved eminence. But the business of a surgeon is properly speaking with external ailments and injuries of the limbs, with a view to the recovery of a patient. In a case of that description he may perhaps prescribe and dispense medicine." Then he concludes and says, "we think the plaintiff has interfered with the province of the apothecary, and that therefore this rule must be discharged." Now, my Lords, I have quoted these cases to show your Lordships that the art of an apothecary is quite distinct from that of vending drugs, and of course if you are going to hold that because apothecaries formerly sold drugs in their shops, a chemist by selling drugs in his shop is acting and practising as an apothecary, of course no physician's prescription can ever be made up by a chemist and druggist again, and of course the whole trade of a chemist and druggist would be gone, because that is the principal part of his business.

The Lord Chief Baron: What is the meaning of what you are now contending for? Because if this were a mere case of a person going in and asking for a particular medicine and the medicine being sold over the counter as by the defendant in this case, that would be acting, it may be merely as a chemist and druggist; but here the patient, if there is a patient, goes and consults him and upon that consultation he recommends a certain medicine, or thinking that a certain medicine would be appropriate and useful he supplies that medicine.

Sir Henry James: My Lord, that is not sufficient.

Mr. Baron Cleasby: Allow me to make an additional interruption. I understand what you say is this—undoubtedly it was part of the business of an apothecary to make up the prescriptions of physicians.

Sir Henry James: Certainly.

Mr. Baron Cleasby: You say if you are to construe the Act of Parliament in the way that is contended for, every chemist who makes up a prescription presented to him with the initials of a physician is liable to a penalty.

Sir Henry James: That is so. If the Lord Chief Baron will forgive me, I am most anxious to follow his view of the argument, but if he would allow me to proceed with the view of the case I was taking, I think we shall shorten the argument when we came to apply the principle, which I wish to submit to your Lordships, ought to govern the construction of this statute to the particular facts of this case, and it is rather difficult before we quite determine what this statute means to spring at once into the particular facts of the case. Now, my Lords, I am still upon the question of what was "acting and practising as an apothecary," and it is in order to know what is the meaning of this statute that it is neccessary to know what an apothecary was—in what sense he acted and practised his business; and I am showing to your Lordships that there was first, in former times, but one act that was done by an apothecary, viz., that he sold wares; that afterwards and by degrees he had attached to his existence as an apothecary the performances of other duties and he practised and acted in a different manner, viz., that he brought skill to bear upon attending diseases other than those cases which were called surgical cases, or organic diseases where the ordinary functions did not act. Every disease, except those diseases and injuries, it was the province of the apothecary to attend upon and give advice, and that although he sold no drugs, although there was no medicine administered, and therefore no drug could have been sold, he had a right to charge for his attendances, viz., for the advice he gave to the patient, without selling anything at all. I am now pointing out to your Lordships, if you will allow me, that you cannot construe the Act literally, because if you say that a chemist by selling a drug is acting and practising as an apothecary, we reduce the Act to an absurdity. It is true that in selling a drug he acts an an apothecary would act, and perhaps did act to some extent in 1815, because an apothecary may have sold drugs then, and he may have practised as an apothecary in that sense; but still your Lordships are not going to convict him for that, of course. Therefore, so far as anything is done in relation to the selling of a drug that does not come within the 20th section of the Act of George III., and it must be something other and different than the performance of a duty of an apothecary *quâ* the selling of a drug. Now, my Lords, there are some cases that throw light upon this question, when it was necessary to construe the 21st section of this Act. Your Lordships will recollect that by the 21st section of the Act,

"No apothecary shall be allowed to recover any charges claimed by him in any court of law unless such apothecary shall prove on the trial that he was in practice as an apothecary prior to the 1st day of August, 1815."

The Lord Chief Baron: He shall not recover for what?

Sir Henry James: Any charges, my Lord.

The Lord Chief Baron: What section are you reading?

Sir Henry James: Section 21, my Lord. He shall not be allowed to recover any charges claimed by him in any court of law. Now, your Lordships see that after the passing of this Act there were many questions that arose when an apothecary brought his action upon his bill, because all the apothecaries who had been practising before 1815 did not apply again for a certificate. They did not subject themselves to an examination, and in order to prove their right to recover they had to prove that being without a certificate under section 21 they had practised "As an apothecary before the 1st of August, 1815." Then, my Lords, the judges had to determine whether they had or had not practised.

The Lord Chief Baron: Of course, this man, the defendant, did not practise before 1815.

Sir Henry James: Oh no, my Lord, of course he did not. I am afraid I have not made myself understood for the moment. Your Lordships will see on section 20 we are discussing the words "act or practise as an apothecary."

The Lord Chief Baron: Yes.

Sir Henry James: Now, will your Lordship be good enough to look at section 21, where you see the words are not quite the same, but that a person might practise after 1815 if he was in practice as an apothecary before.

The Lord Chief Baron: Yes.

Sir Henry James: Well, my Lord, I thought it was of some value to see what was the meaning of the words in section 21, "In practice as an apothecary," as bearing upon the proper construction to be put upon the words, "act or practise as an apothecary" in section 20. In that view it was advisable to look at the cases where a construction had been put upon the words "in practice" in section 21.

The Lord Chief Baron: Yes.

Sir Henry James: That was the point, my Lord. That has nothing to do with this gentleman, who I hope was not in practice before 1815; he must be a very old man if he was.

The Lord Chief Baron: Well?

Sir Henry James: The question that had to be determined under section 21, if I may explain it again, arose always in actions for penalties.

(Their Lordships conferred together).

Mr. Baron Cleasby: My Lord does not object to my saying that regarding this as a most important question, as I think it is, I myself feel very great difficulty in dealing with it as the case stands, because I cannot help looking on section 28 as a most important one.

Sir Henry James: Yes, my Lord, it is.

Mr. Baron Cleasby: There are four branches of the medical profession, namely, physicians, surgeons, apothecaries, and chemists. You will find it is laid down so that chemists form one branch of the medical profession. Well, consider what a chemist is entitled to do after the passing of the Act of 1815, and referring to the rights reserved by the 28th section. That section recognizes chemists as a branch of the profession, and reserves to them all the rights which they were in the habit of exercising (right or wrong) before 1815.

Sir Henry James: Yes, my Lord.

Mr. Baron Cleasby: What materials have we before us upon which we can come to any conclusion upon the point as to the present defendant being entitled to the privilege of that section?

Sir Henry James: My Lord, it is a question not only of great importance to every chemist and druggist, but to every poor person who frequents a chemist and druggist's shop. As regards the point of the 28th section, that is entirely distinct from the point we are now discussing. I should have to take, if I may say respectfully, the same view that your Lordship has expressed, when I come to the point that the learned county court judge has found no fact whatever upon the evidence. There is the evidence of the two witnesses for the defence—Parsons and Glaisyer.

Mr. Baron Cleasby: That is hardly sufficient. If you show going back as far as living memory does that chemists have been in the habit of dispensing across the counter, giving all the evidence you can on the point, that now and for a considerable time it has been part of the business of a chemist to do that, it would be very important.

The Lord Chief Baron: Of course, if it should appear that in this case the defendant has done nothing more than every chemist and druggist in the kingdom has a right to do—if he has not acted as an apothecary—then the judgment is wrong altogether.

Mr. Baron Cleasby: If he has acted not as an apothecary but in a manner that he is justified in doing.

The Lord Chief Baron: Acted as an apothecary.

Mr. Baron Cleasby: He has acted as an apothecary; because, of course, an apothecary has to make up prescriptions.

Sir Henry James: Certainly, my Lord; I may apparently have gone over some ground which, at first sight, may not have appeared to bear on the statute, but with submission it seems to me it is most relevant, and almost crucial to this case to show your Lordships that what an apothecary was is now the common business of a chemist and druggist, and that he is bound to fulfil that business. I will show your Lordships, under the Pharmacy Act, that so far as the apothecary, who until lately did nothing else but sell drugs, the chemist, of course, is entitled to sell drugs apart from giving advice; and therefore it is important to see whether what the chemist has always done does not came within one construction of the words "act or practise as an apothecary," and I am endeavouring to show your Lordships that that one construction of acting or practising as an apothecary, viz., selling drugs which of course was the act and practice of an apothecary—that that cannot be the construction to be put upon these words. Do I gather from what the learned Baron says that he thinks there ought to be some more clear finding by the learned county court judge upon the evidence of the two witnesses?

The Lord Chief Baron: You may put it in what language you like. The apothecary has power to do what a chemist and druggist also has power to do, that is, to make up prescriptions and vend medicines across the counter, and, therefore, so far he may act as an apothecary if he happens to have an apothecary's certificate, or it may be done by a chemist and druggist who has no such certificate, and is not an apothecary. But the question here is whether upon what the defendant has done, which is something more than merely selling drugs or medicines across the counter, because it is his being consulted and giving something in fact to a man who tells him that he has a pain in his chest or a sore throat, or one thing or another, he thereupon supplies him with medicine. If you can show that that also is within the privilege of a chemist and druggist, although it may be within the privilege of an apothecary also, to hold that this man is liable to this action and subject to the penalty, would be to hold that every chemist and druggist is liable.

Sir Henry James: My Lord, we must argue the case by steps.

Mr. Baron Cleasby: It will be a very long argument in this case, and it may turn out at last to be futile.

Sir Henry James: Certainly.

Mr. Baron Cleasby: It seems to me to be a case of so much importance that if I were to say what my view of it would be—I do not think we ought to do that now; but what I should recommend would be this, that a new trial should be ordered, and that a *certiorari* should be applied for to have this question argued in the court.

Sir Henry James: As I have endeavoured to put myself into possession of this case, directly we come to take the view which the Lord Chief Baron has pointed out, and to apply it to this case, we shall place before your Lordships the gravest possible difficulty to determine where the duties or the rights of a chemist and druggist cease, and those of medical men begin. I am using the term in its ordinary sense. I may say at once that every chemist and druggist in this country is interested in this matter, and, no doubt, to some extent they are taking a practical interest in this litigation and, therefore, as your Lordship suggests, if the Apothecaries' Company wish to bring this matter to a solemn decision in that way, I accept it most readily, and ask that that should be done.

The Lord Chief Baron: I have no objection to that course.

Sir Henry James: I must readily accept what has been said upon this point of the 28th section, there being no judicial decision at all given. If a new trial is ordered we will undertake to ask for the removal of this case to a Superior Court, in order that we may, if necessary, take it to the highest Appeal Court to which we can take it.

The Lord Chief Baron: I have no objection to the course suggested by my brother Cleasby, quite the contrary. What does the other side say to it?

Sir Henry James: My friend, Mr. Day, is thinking over it, my Lord; he will give your Lordship an answer in a moment. He is in consultation.

Mr. Day: If I may be allowed, my Lord, to make a suggestion, I am told that there is another case involving precisely the same point, now in course of progress, if I may use that expression, in your Lordship's Court. I do not know whether it is yet set down for trial.

The Lord Chief Baron: Do you mean an action to be tried in this Court?

Mr. Day: An action of the Apothecaries' Company *v.* Wiggins. In fact I am told there are two such cases pending, and those cases of course are in train for solemn decision. What I would respectfully suggest to your Lordships is this, that if your Lordships have any doubt as to what the finding of the learned county court judge is that this case may be sent down for him to give his finding upon it, and that the matter should not be argued until after the decision of the cases in your Lordship's Court.

The Lord Chief Baron: That it shall be sent down for what?

Mr. Day: Sent down, my Lord, to be restated, because I am assured that the learned county court judge did find the fact on which the discussion has arisen, viz.

whether there had been a practising as an apothecary. I am assured that he actually did find it as a fact.

(Their Lordships conferred.)

The Lord Chief Baron: I see no objection to its being sent down again to be restated. In that event no consent will be necessary. We may at once say, and I daresay you would not hesitate to agree, even if we were not to exercise the power which we possess, but which we are slow to direct—that this case should stand over altogether until after the decision of one or more of the cases to which you have referred.

Sir Henry James: My Lord, my friend mentioned the case of the Apothecaries' Hall *v.* Wiggins. I know nothing about Mr. Wiggins, but one of my learned friends who assists me says he does.

The Lord Chief Baron: What?

Sir Henry James: This case my friend has mentioned, of the Apothecaries' Company *v.* Wiggins. One of my learned friends, whose assistance I have, is counsel in this case, and he informs me that Mr. Wiggins has not acted quite in the same way as this gentleman.

The Lord Chief Baron: That does not matter; if there be a case which will raise anything like the questions we have to determine here, we should like to have that case tried before a judge and jury in one of the Superior Courts before we proceed to decide finally upon this case.

Sir Henry James: I have no objection to this case standing over; but may I point out, supposing in the case which is now in your Lordship's Court it should be proved that the defendant has been in the habit of attending patients at their houses and has been giving advice perfectly distinct and independent of the selling of drugs, of course I am not going to be bound in this case by that decision.

The Lord Chief Baron: Oh no; you would not be bound. Neither party would be bound by anything that may hereafter take place; it is only that we may be a little enlightened by what may take place in those cases in this court, or any one of them, before pronouncing our decision upon the case which is now before us.

Mr. Day: Wiggins's case is in this court.

The Lord Chief Baron: I think it is extremely probable—do not imagine that I am throwing out anything like a decision—but I think it is extremely probable that if we were to consume the day in hearing this case argued, the end would be that we should, without giving any reasons or any judgment at all upon the law, direct a new trial. I think it is extremely probable, but do not think I am so adjudging. Therefore, if instead of that, which would be condemning the parties to go before the county court judge again, whose decision after all may be wrong, you would agree to have a new trial in this court.

Sir Henry James: That was Mr. Baron Cleasby's suggestion, with which I readily fell in. If your Lordships will direct a new trial in this case we will undertake to apply to your Lordships for leave to remove the case for decision to the Superior Court. But my client is personally interested in this decision and he wants a decision upon his own case and not upon Mr. Wiggins's case, and if your Lordship will take that course we will bring this case up.

The Lord Chief Baron: You say that if we direct a new trial it shall be agreed at once that the case shall be transferred from the county court to this court.

Sir Henry James: Certainly; we will take that course.

Mr. Day: I should submit respectfully that there is no ground on which your Lordships can direct a new trial. I submit that the facts have been before the county court judge and that he has given his decision. If your Lordships think the case does not sufficiently set out the facts and your Lordships wish to ascertain what the learned judge's finding was, I suggest the better course and the only proper course is to send the case down to be restated. On behalf of my client, I must say we prefer to stand upon the trial.

Mr. Baron Cleasby: We have power by the Act of Parliament to direct a new trial.

Mr. Day: Yes my Lord.

Mr. Baron Cleasby: If it appears that a material issue or a material question is not disposed of one way or the other by the decision, to direct a new trial would be the proper course.

Mr. Day: Undoubtedly.

The Lord Chief Baron: The better way will be to have a new trial and then if it be brought before this Court in the meantime either party will give whatever evidence he thinks fit. Then we shall be in full possession of all the facts and the law which can be proved, to enable us to judge whether the defendant has committed a breach of law or not.

Mr. Day: What I submit is that no issue has been left undetermined; that the trial was complete so far as it goes, and your Lordships have nothing but the case before you. I submit that if the case is not sufficiently stated the course that should be taken is that it should go back to the county court judge to restate the case. That I can have no objection to, but I do protest against a new trial being ordered where there is no evidence of any issue being left untried by the learned judge or any improper direction, or improper finding on the issue.

The Lord Chief Baron: I think, considering that you appear for the great Apothecaries' Company, who can be interested only in seeing that the law is conformed to and obeyed, if we think that upon such a case as this, where a penalty is claimed in the action, that it ought to be fully considered and that either party should have full liberty to have all the evidence of which the case is susceptible, you ought to agree to it.

Sir Henry James: My Lord, I would also join in the appeal which your Lordship has made to my learned friend. He appears for the Apothecaries' Hall. My client is in this position that he might go and do the same thing to morrow, and have a fresh action brought against him, and this ought not to be treated as a question of the costs of the old action.

Mr. Day: Oh, no; it is no question of costs. I never suggested it, but we desire to get a decision at the earliest possible moment.

The Lord Chief Baron: You will have a decision, if, instead of sending it down to be restated, we direct a new trial and it is agreed at once that the case shall be transferred into this Court.

Sir Henry James: If your Lordship pleases.

Quinine Pills.

At the Wednesbury Police Court on the 20th inst., before Mr. I. Spooner (Stipendiary), Henry V. Jessop, chemist and druggist, Market Street, Willenhall, was summoned by J. G. Horder, inspector under the Food and Drugs Act for the South Staffordshire district, for having sold, on the 10th of September, to Henry Constable a certain compounded drug—to wit, quinine pills, which were not composed of ingredients in accordance with the demand made.

The defendant said he did not sell the pills; his assistant sold them.

Mr. Spooner: You are responsible for the goods sold in your shop.

Henry Constable said he was in the employment of Mr. Horder, the inspector, and on the 10th of September he visited the defendant's shop and tendered a piece of paper to the asssistant, on which was written "Twelve quinine pills." He received a box containing the pills, and he afterwards gave them to Mr. Toy, a senior assistant to Mr. Horder, who stood outside the shop whilst he purchased them.

Defendant said the pills were made in accordance with the orders of the Pharmacopœia, and it was also understood that some quinine pills should be so made as to enable the maker to sell them at a reduced rate so that poor people might be in a position to purchase them.

Mr. Spooner: But the pills did not contain as much quinine as they ought to have done.

Isaac Fry deposed that he received the pills from the last witness, and he went into the shop and informed the assistant that the pills had been purchased for the purpose of being analysed. He then returned to him part of the pills.

Mr. Horder having proved that he forwarded the remainder of the pills to Mr. Jones, the county analyst,

Mr. Jones stated that the pills were forwarded to him on the 18th of September, and after analysing them he gave the following certificate:—"I am of opinion that the said sample, if intended as four grain pills, contains 1·21 grain of sulphate of quinine too little, and in each pill, viz., 1·79 instead of three grains, but the pills averaged 4·65 grains, and therefore the percentage of sulphate of quinine in the mass is 38·55 instead of 75, as ordered in the Pharmacopœia."—In answer to the Stipendiary, witness said there were but six grains [so reported] in two pills, whereas there should have been a grain more in each pill.

Mr. Spooner said he did not see how he could convict in the present case.

Witness said the messenger was sent to defendant's shop in accordance with his instructions, and on the note was written "B. P.," which meant that the pills were to be such as those ordered by the Pharmacopœia.

Mr. Spooner said that the private mark referred to was liable to various constructions.—After further remarks had been made by Mr. Jones, the Stipendiary said the case would have to be dismissed, but he would advise the defendant not to sell such pills again. If Mr. Horder wished he would grant him a case for a higher Court.—*Birmingham Daily Gazette.*

Prosecution under the Pharmacy Act.

At the Petty Sessions held in the Corn Hall, Stradbroke, Suffolk, on Thursday, November 22, 1877, before the Rev. W. R. Colbeck (chairman), the Rev. F. French, and the Rev. H. S. Marriott, Ephraim Cullingford, grocer, etc., was charged by Hart, P.C., with selling poison; he not being a chemist. He was fined 4*l.* 17*s.*, including costs. He was further charged with selling poison without having the word on the wrapper, and without making a proper entry. These informations were withdrawn.—*Sussex Chronicle.*

[*** According to the 15th clause of the Pharmacy Act, 1868, an unregistered person selling poison becomes liable to pay a penalty of *five pounds* to be "sued for, recovered, and dealt with in the manner provided by the Pharmacy Act [1852] for the recovery of penalties under that Act," where the Registrar under the Act is specified as the person who is to recover the penalty "under the provisions of any Act in force for the easy recovery of small debts and demands." It follows, therefore, that if the above report is correct, the decision of the Stradbroke magistrates was illegal, as they had no power either to reduce the penalty below £5, or to enforce it on the application of a police constable. The offence of insufficiently or improperly labelling a poison is quite distinct from the breach of the law as regards the Register, and in such a case any person may act as prosecutor.—Ed. Ph. J.]

Conviction for Administering Laudanum to a Child.

In the Paisley Sheriff Court, Monday, November 26, before Sheriff Cowan and a jury, Jane M'Kean or Corbett, was indicted on a charge of culpable homicide, or, alternately, of having recklessly administered laudanum or other deleterious drug on the 15th ult. to a child seven months old. It appeared that the child was put out to nurse at a house where the prisoner was staying, and that it died with symptoms of opium poisoning.

James M'Ginn, aged ten, said prisoner sent him for a halfpennyworth of laudanun. He did not know what the laudanum was for. Corbett (the prisoner) poured the laudanum out of the cup into the child's mouth. She afterwards gave the child to witness and went to bed. The child was "greeting" when Corbett sent for the laudanum.

By a juryman: Corbett did not state the object for which she had given the laudanum.

Mary M'Kie or M'Ginn gave corroborative evidence.

Eliza Robertson, barmaid with Mr. T. Arrol, publican, recollected the boy M'Ginn getting two imperial gills of whisky on Monday the 15th ult.

John Paterson, detective officer, said the boy M'Ginn pointed out Mr. Wilson's, druggist's shop, as the place he had got the laudanum.

Wm. Wilson, druggist, 36, Ferguslie, deponed that he did not recollect the transaction referred to. He sold laudanum at the rate of one drachm of 60 drops for halfpenny. He manufactured the laudanum himself. He sold laudanum as often as any other medicine in the shop, and quite frequently to boys of ten. He sometimes refused children who came for it.

By the Sheriff: It was nothing unusual for him to sell laudanum to children even although a drachm was two doses for a healthy man. He manufactured the laudanum in accordance with instructions in the British Pharmacopœia, allowing two-and-a-half ounces of opium to a pint of alcohol.

Prisoner's declaration was then read. She sometimes took laudanum, she said, for a nervous wind on the stomach. She recollected going to M'Kie's house on the day specified. She sent the boy for only one gill of whisky, having previously sent him for halfpennyworth of laudanum, of which she gave the child a small quantity and drank the rest herself. She was not aware that a few drops of laudanum would kill a young child, and had drank as much as one pennyworth herself at a dose.

The medical report of Drs. Richmond and Graham was then read. The immediate cause of the child's death was congestion of the brain, the *post mortem* experiences corresponding with those which might be expected from an overdose of laudanum. Dr. Richmond, after reading the report, deposed that a half drop of laudanum was sufficient for a child seven months of age. Laudanum had to be administered with the greatest caution to young children and old people. For a healthy man the dose averaged from 20 to 30 drops. He had no doubt that laudanum was the cause of death.

The jury unanimously found the prisoner guilty of the culpable and reckless administration of laudanum to an infant child, whereby it was deprived of life, as libelled, and recommended her to the leniency of the Court.

Sentence of three months' imprisonment was then passed.—*From the Glasgow Herald.*

The Right to Sell "Condy's Fluid."

In the Court of Appeal, November 27, before Lords Justices James, Baggallay, and Thesiger, the case of Condy *v.* Mitchell was heard.

This was an appeal from an order of Vice-Chancellor Bacon, refusing to restrain the defendant, a former partner with the plaintiff, from carrying on the business of a manufacturer of disinfecting fluid under the style of Condy's Fluid Company, though his Lordship at the same time declared that the defendant had no right to use the plaintiff's full name of Henry Bollmann Condy, under which title the partnership business had been carried on. It was admitted by the plaintiff at the bar that, in face of the recent decisions in the Singer sewing-machine case, it could not be contended that a manufacturer has not a right to call the article he makes by the name it has acquired; but it was contended that the defendant's rival articles being of different composition to those made by the plaintiff, he had no right to carry on business under the style of the Condy's Fluid Company, so as to deceive the public, and leave them to believe that the former were made under the management and superintendence of the plaintiff. Patents obtained by the plaintiff for his fluids had expired. He had carried on business alone in their manufacture from 1856 to 1870, when he took the defendant in as a partner, and the business was then carried on under the name of Bollmann Condy and Co. The partnership was dissolved in 1873, and for some years the business was carried on by a receiver appointed in a suit instituted by the defendant, that official, of course, using the trade name and labels. The plaintiff commenced another business in the meantime in his own name, and the defendant took the same course, using the style of Condy's Fluid Company. This the plaintiff complained of, and sought to restrain, on the ground that the name could only have been adopted for purposes of deception, and to represent to the public that the defendant's fluids were made under the superintendence of the plaintiff as inventor. Evidence was adduced in support of the plaintiff's case, for the purpose of showing that people had actually been deceived. It was further alleged that while the plaintiff's fluids were made from permanganates of soda and lime—both expensive and special products—the defendant's were obtained from permanganates of potash, a cheap and objectionable article, common in the market. The defendant simply claimed the right to trade as a maker of an article which anybody might manufacture, and which could only be described by its name.

Mr. Hemming, Q.C., and Mr. Bradford appeared for the appellant; Mr. Kay, Q.C., and Mr. Woodroffe for the respondent.

Their Lordships strongly disapproved of the course of employing detectives to procure evidence of the sales of defendant's articles which had been pursued by the plaintiff, those emissaries having handed to the shopkeepers slips of paper bearing the plaintiff's name, to particularize the purchases, a proceeding which might easily operate to prevent the sale of the defendant's fluids. The Vice-Chancellor had made the proper order. The defendant had made no misrepresentation, and was entitled to sell disinfecting fluids which he had formerly made in partnership with the plaintiff under the names by which they were known. Accordingly the appeal must be dismissed, with costs.—*Daily Telegraph.*

Dispensing Memoranda.

[21]. Troy or Avoirdupois?—I have noticed with, I may say, no small amount of interest, the discussion for the last few weeks on the dispensing of prescriptions, as to whether when a physician writes the sign ℥, he means the *old* apothecaries' (as some of our chemists style it) or the avoirdupois. The former is the only one (except the metric system) capable of being divided up without any chance of mistake.

It would no doubt have been much better for the Medical Council when they did away with the one to have done the same for the other, substituting the metric system for them.

Since the discussion has been going on I have had the opportunity of asking three or four medical men, when they write, say Sodæ Bicarb. ℥ss, if they mean the avoirdupois. In each instance the answer has been most emphatically no, they mean ʒiv apothecaries'.

I have been always accustomed to dispense a prescription according to the apothecaries weight, feeling perfectly certain in my own mind I am carrying out the wishes of the physician.

I should not think if a chemist received a prescription like the following, he would make it up weighing the two first ingredients by the avoirdupois, and the other by the apothecaries' weight.

℞ Sodæ Carb. . . . . ℥jss.
Pulv. Zingib. . . . . ℥ss.
Pulv. Rhei . . . . ʒvj.
M. ft. pulv.

Would he be justified in using two different kinds of weights? It would, I think, be evident to men of reason that it was meant by the physician to be 480 grains to the ounce, not 437·5.

I wish some of our brother chemists who are so much in favour of doing away with the apothecaries' weight, would do as I have done, take the trouble to ask a few medical men what they meant by the sign ℥. They would find nineteen out of every twenty of the same opinion as myself.

I will undertake to say if a vote were taken of all the chemists in the kingdom three-fourths of them would think the same.

It seems a very strange thing that after a lapse of thirteen years this controversy should spring up. It would have been much better had the Council not abolished it and recommended physicians when they meant the troy ℥, that a T should be placed after it; this I think would have suited all parties concerned and would not be a difficult thing for the doctor to remember.

Chas. Smale.

[21]. Troy or Avoirdupois?—Is it allowable to translate ℥j into one ounce avoirdupois?

Two other questions, fairly considered and candidly answered, ought to throw a light sufficient for our guidance on the above subject, which if obscure in any degree has been made so only by the collateral issues raised by certain correspondents.

1. Is there any recognized authority which has ever defined, or would ever define ℥j as being the equivalent of $437\frac{1}{2}$ grains?

℥j = ʒvij gr. $17\frac{1}{2}$. At first view the equation does not look well.

2. When a physician writes ℥j has he in his mind's eye the sixteenth part of an avoirdupois pound, or does he not certainly intend eight times the value of the apothecaries' drachm, to be dispensed? Until we get some Vatican decree which shall be final in this matter, we had as well retain practically in our weighings the old belief that

1 oz. = $437\frac{1}{2}$ grains.
℥j = 480 „

Truro. Samuel Feaver.

[21]. Avoirdupois *v.* Apothecaries.—Whilst there can be no doubt but that the British Medical Council decreed that the sign ℥j should be used to indicate one ounce avoirdupois, and that only (that they do not leave it optional with the physician may be inferred from the fact that they allow it to "be optional with the physician in prescribing to use the symbols ℈ and ʒ"); yet I have been surprised that the majority of medical men with whom I come in contact, invariably mean an ounce troy in using the symbol ℥j. This variance with official decrees places the chemist in an awkward position. It seems to me that this discussion has already been somewhat too prolonged without any probability of a satisfactory settlement. Would it not be better to call a special meeting, or allow it to be discussed at next week's meeting at Bloomsbury Square?

Wm. Hy. Symons.

[21]. ℥ *versus* Ounce.—I am surprised there should be so much correspondence on this subject, for I cannot imagine that much difficulty ever occurs in actual practice, for although ℥ is an obsolete sign still in use (if such is not a contradiction of terms) and so open to two constructions, still the nature of a prescription will generally give us a clue to the prescriber's intention. Common sense tells us that when used in a formula for

internal remedies where the amount is arrived at by multiplying a single dose that it means 480 grs., and I contend that as that was its value in the P.L., and as it is omitted from the B.P., that literally that is its true significance, although probably the same prescriber who uses ℥i to represent 480 grs. in a mixture, in writing Ung. Cetacei, ℥i, would mean the B.P. ounce (if the difference occurred to him at all); but to be strictly correct a physician ought not to use the symbol ℥ to represent 437·5 grs. as it is a sign not mentioned in the B.P. But as medical men, like other mortals, are not infallible, until the much needed metric system is universally established we must not be guided by any arbitrary interpretation of a doubtful sign, but use our judgment and common sense in the faithful discharge of our duty.

Cambridge. M.P.S.

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[21]. ℥ *v.* Ounce.—The prescription I quoted, through some blunder either of mine or the printers, had no doubt a very unusual appearance. It was one dispensed by me, and was written by an old practitioner as a cooling drink for a patient of his, and ought to have been—

℞ Ol. Limonis . . . . . . gtt ij
Sodæ Biborat. . . . . . ʒij
Sacc. Alb. . . . . . . ʒiv
Potass. Bitart. . . . . ʒj.

To be mixed in a pint of water for a drink.

I think a few grains of common sense would help us far more in any difficulty in this and some other matters than some people seem to suppose. No one, I imagine, would think of weighing a troy ounce of water if ℥j aq. were ordered. Mr. Symes knows that long before the B.P. was invented the sign ℥ was used to denote a fluid ounce of any liquid as well as 480 grs. of any solid, and I should draw exactly the opposite conclusion from the potass. bicarb. prescription and say there is no doubt that the prescriber intended the solution to contain 48 grs. to the T℥j, and not 43·75 grs.

"G. S." speaks of the London Pharmacopœia as being obsolete. He may think so, but there is at least one eminent medical man in this city, with no small practice, who almost invariably writes on the head of his prescriptions "P.L. 1851."

Manchester. W. Wilkinson.

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[24]. Pill Coating.—Among the varied correspondence on coating pills I have not seen, to my remembrance, any thing written about the following process, which I tried on a few pills, with satisfaction as to result:—

The materials needed to furnish the coating are, albumen, such as white of egg, and very finely powdered white sugar. Pills sufficiently firm and dry may be thinly enveloped in the albumen by rolling between the fingers and thumbs with just sufficient albumen to cause cohesion of the sugar, and no more; they are then placed in a suitable vessel containing the sugar, in which a rotary or suitable agitation will secure pills of pleasant taste; but I do not know how long the coating would last.

The suggestion naturally occurs that a more conveniently obtained form of albumen than white of egg would obtain favour where such a practice existed; probably also the mode of application may be much improved.

East Dean. Edward Jerrett, A.P.S.

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[29]. Tinct. Chin. Nit.—May I criticize your remarks on the "Dispensing Memoranda" of the month?

In 29 a formula is required for Tinct. Chin. Nit. You state "this is evidently a preparation of China Nit. or Cinchona Nitida, etc."

Please excuse me for saying it is nothing of the sort, but a common preparation in homœopathic pharmacies as prescribed by Dr. Kidd. The formula is:—

Quiniæ Disulph. . . . . ʒij.
Aquæ Dest. . . . . ℥x.
Acid. Nitrici . . . . ʒiv.

Mix and add

Spt. Vini Rect. . . . . ℥vj.

I am not a homœopath, but meeting with the preparation in a prescription I referred it to a neighbour who kindly supplied the formula as given to him by the prescriber. J. Whitfield.

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[29]. Tinct. Chinæ Nit. is a homœopathic preparation by Dr. Kidd, and is a preparation of nit. quinine. Probably "A Country Dispenser" will find affixed to it on the prescription 1 dec. or 1-100 or 2 dec. 2-200, signifying the potency. I occasionally dispense it and other homœopathic preparations which I procure from a homœopathic chemist.

Hadleigh. R. E. Read.

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[40]. Where Balsam of Peru is ordered in pills, it answers well to combine it with a little bees' wax.

I think I gathered this some time ago from the Journal and have found it practically useful. J. Whitfield.

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[41]. SALICYLIC ACID LOTION.—Will any one inform me if a dispenser is justified in straining or filtering out the undissolved acid in the following prescription?—

℞ Acid. Salicyl. . . . . ʒij.
Aquæ, ad . . . . ℥viij.
M. ft. lotio.

A sufficient quantity mixed with an equal quantity of warm water to be used in the manner directed. F. P.

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[42]. I should be glad to know the chemical change which takes place in the enclosed prescription. Before adding the tr. opii, the mixture is of course perfectly clear, but on this addition being made a semi-opaque milky compound is produced, which on standing throws down a brownish flocculent deposit, and therefore forms a very inelegant mixture. Is it the intention of the prescriber that the mixture should be "shaken before taken"?

Tr. Opii . . . . ʒij.
Pot. Iodidi . . . . ℈ij.
Liq. Hyd. Bichlor . . . . . . ℥ij.
Aq. M. P. ad . . . . ℥vj.

M. ft. M. ʒij ex aq. ter die sumd. Qy., can this mixture be prepared so as to form a bright solution?

A Tyro.

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[43]. Would some one inform me how to dispense the following prescription, which I had to make up?—

℞ Ung. Zinci . . . . . . ℥j.
Sp. Vini Rect. . . . . . ʒj.
M. ft. Unguent. An Assistant.

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[44]. Will you be good enough to insert in the *Pharmaceutical Journal* the translation of the following?—

℥j bis 7 mane. S. H.

Notes and Queries.

[564]. COMPOSITION POWDER.—Can any of your readers oblige with a formula for "Composition Powder" (Coffin's)? It should contain "cayenne, ginger, and cloves, etc.;" the formula, October, 7, 1876, is not the one sold here.

Kidderminster. Vaseline.

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[565]. WHITE FULLERS' EARTH.—Can any reader inform me where I can obtain some White Fullers' Earth that is sold by some chemists, or is it merely the ordinary fullers' earth mixed with starch powder?

Tenens.

DEODORIZATION OF IODOFORM.—Dr. Cole (*New Remedies*, vi., 307) states that iodoform may be deodorized by the addition of tannin. He uses a compound of equal parts of iodoform and tannin as an application to chanchroids and old offensive ulcers.

BOOKS, PAMPHLETS, ETC., RECEIVED.

THE POCKET FORMULARY AND SYNOPSIS OF THE BRITISH AND FOREIGN PHARMACOPŒIAS, comprising Standard and Approved Formulæ for the preparations and compounds employed in Medical Practice. By HENRY BEASLEY. Tenth Edition. London: J. and A. Churchill. 1877. From the Publishers.

PRACTICAL OBSERVATIONS ON THE DEGENERACY AND PRESERVATION OF THE TEETH. By EDWIN COX, L.D.S. London: E. Stock. 1877. From the Author.

JAHRESBERICHT ÜBER DIE FORTSCHRITTE DER CHEMIE UND VERWANDTER THEILE ANDERER WISSENSCHAFTEN. Herausgegeben von F. FITTICA. Fur 1876, Erstes Heft. Giessen: J. Ricker. 1877. From the Publisher.

Obituary.

Notice has been received of the death of the following:—

On the 26th of July, 1877, Mr. Edward George Jones, Chemist and Druggist, Staines. Aged 45 years.

On the 28th of July, 1877, Mr. Edward Pitt Tate, Chemist and Druggist, Eastbourne. Aged 40 years.

On the 27th of August, 1877, Mr. Frederick Augustus Williams, Chemist and Druggist, Wellington, Somerset. Aged 65 years.

On the 21st of September, 1877, Mr. William Knight, Chemist and Druggist, Tewkesbury. Aged 69 years.

On the 23rd of October, 1877, Mr. Richardson Wilson, Chemist and Druggist, Hessle Road, Hull. Aged 49 years.

On the 5th of November, 1877, Mr. Urban Parminter, Chemist and Druggist, Exeter. Aged 56 years.

On the 13th of November, 1877, Mr. Thomas Hornsby, Chemist and Druggist, of the London Hospital. Aged 46 years.

On the 18th of November, 1877, Mr. John Steward, Pharmaceutical Chemist, Kingswinford. Aged 61 years. Mr. Steward had been a Member of the Pharmaceutical Society since 1853.

On the 23rd of November, 1877, Mr. Thomas Davys Manning, Pharmaceutical Chemist, Yeovil. Aged 44 years. Mr. Manning had been a member of the Pharmaceutical Society since 1869.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

ADMISSION OF WOMEN TO MEMBERSHIP.

Sir,—The letter of Mr. Fryer (as you pointed out at the time) was so foreign to the subject that I was not surprised at the way in which your correspondent Mr. Price treated it, his able exposition of the point at issue, supported by "Frater" and Mr. Senier, leaves little more to be said; however, as the subject has to be further considered at the next annual meeting, it is well that the members in the country should give expression to their opinion. The Council were evidently so divided in opinion that four years ago they remitted the subject to the annual meeting, and Mr. Hampson then proposed a motion and very ably supported it. Leaving out the preamble it ran thus:—

"This meeting is of opinion that it is contrary to the plain intention of the statutes to refuse admission to female persons who, having conformed to the legal tests of the examiners and the regulations of the Society, may desire to become connected with the Pharmaceutical Society in the capacity of apprentices or students, or associates, or members."

This was negatived and will now assume another form, inasmuch as the progress of events has clearly shown a better and more liberal feeling towards females, and that a course of obstructiveness only tends to further the object opposed, so that that which is now only a request may become a demand. Certain ladies having distinguished themselves and complied with the requirements of an Act of Parliament ask for the reward of their industry, and certain influential members of the Council oppose on the only plea that they can urge, viz., that they are women. And the most remarkable fact in connection with the opposition is that the opponents are chiefly composed of the bachelors of the Council—men distinguished for benevolence and strenuous supporters of the widow and orphan. This seems an unaccountable anomaly. The limited number of females ever likely to enter the Society is not of sufficient magnitude to excite jealousy of their becoming members of Council or possible Presidents of the Society.

I have carefully examined our Acts of Parliament for 1852 and 1868, and also our bye-laws, but I can find nothing to justify the action of the Council. Every person passing the respective examinations shall be eligible to be elected a member or associate, as the case may be. Surely "every person" does not imply males only? If any doubt is felt about the decision of the next annual meeting, let the suggestion of your correspondent "Frater" be adopted, that country members may be enabled to express through the local secretaries their wishes on the matter.

PATER.

Sir,—As I was one of the first that took up this subject after the last meeting of the Council, and holding a contrary opinion to those gentleman that have so fully expressed theirs in last week's *Pharmaceutical Journal*, I have deemed it expedient to offer some comments on the principal points which they have urged in their letters as being in favour of the admission of women as members of the Pharmaceutical Society. I shall endeavour to deal in as brief a manner as I can with each letter in the order in which they appear in the Journal.

In the first letter, written by Mr. Price, the first point which I deem worthy of commenting upon, is his very profound mode of arguing. after naming a few points; then coming to the grand and happy conclusion that the reasons employed by his opponent are old and have been used times without number. Such a futile effort of refutation as this is not worthy of the name, for his opponent can say just as much of what he says. In passing I may refer him to that wise saying that says "That there is nothing new under the sun," consequently every thing is old. Next he instances the medical profession and the universities of London and Cambridge. I do not consider that the latter have any relevancy whatever to the point in question, and as regards the medical profession we know that females have been admitted into it, but against the desires and wishes of many of the wise members of that body. Although they have been allowed to practise for some time, I do not think that either Mr. Price or any other pharmaceutist can enumerate any particular benefits that have as yet accrued from it; and surely we do not know what good these ladies might have achieved if they had used both their money and their irrevocable time in a more becoming field of labour, perhaps they might have found an office whose duties they would be far more adapted by nature to fulfil. From what follows I would gather from Mr. Price's words that if he had a daughter that walked not within the limits of propriety, as a mode of convincing her of her folly, he would let her find it out for herself, even to the "bitter end." I need not expatiate upon this point, as every one can see that such a notion is worse than ridiculous. Again, he informs his opponent in an affirmative manner that not many women will ever be likely to enter the profession of pharmacy. I do not pretend to be a prophet or the son of a prophet, consequently I do not know how far Mr. Price is endowed with this spirit, but I think this much, that if he had left it untouched he would not have lost much.

"Frater" at the commencement of his letter gives what I consider to be a very valuable suggestion, viz., to try and get our local secretaries to issue voting papers, and send them to 17, Bloomsbury Square before the annual meeting, for I am afraid that we shall not be able to have anything like an approximation to a fair representation of the general opinion of the Society unless we do so. In this letter there are a few more points which require to be considered. In the first place, he thinks we cannot in justice deny the examined women membership. If we confined ourselves to look only on one side of the question their admission would be inevitable. But since many of us believe with minds unbiased that when women embark in the profession of pharmacy they embark in a profession whose duties by nature they are not destined to fulfil, as they lack in point of fitness, etc., then it follows in congruity with a clear conscience that we can no more vote for their procedure further in such a calling than we could vote for women qualified for the army to be leaders of our regiments in time of battle, however gloriously they might have figured in their respective examinations. Next he asks why should a woman be debarred from rising higher than a subservient to the physician. It might as well be asked why a female tractarian should not be raised to the position of a clergyman. I think that the answer that I have given to the previous question would be applicable to either of these. Further he admits that there is much in the practice of medicine and pharmacy to shock the sensibility and refinement of many educated ladies, and that only few would possess a sufficient nerve. I think that here he plainly but perhaps unwittingly acknowledges the weakness of his position. For if those that are educated and who can be deemed no less competent judges for themselves will be shocked, would it be advisable for us to encourage the more gynandrous species that are less educated and, as I think, should be no better judges. For does not the shock, and the acquisition by degrees of a better nerve, speak plainer than words could put it that the profession which they aspire to has not been intended for them, being something similar to a boy that begins to tell falsehoods, who feels nervous at first but by frequent repetition of the dose hardens his heart and renders it impermeable to the dictates of conscience. Lastly, he remarks, that some people think more of M.P.S. and the Society's arms than the title pharmaceutical chemist. I must say that I respectfully beg to differ with him on this point, as I can testify within my own knowledge, many of the best country businesses use neither the title M.P.S. nor pharmaceutical chemist, but simply chemist, chemist and druggist, and such like, and it is comparatively few of those businesses that are conducted by pharmaceutical chemists that exhibit the title of M.P.S. on their prescription envelopes. Again, if we look on the best businesses in London I think that you will find that many of them use neither the title M.P.S., nor hardly any other, and I may say that I feel fully convinced that in the localities where they are used they are thought of far less by the general public than the pompous chemist thinks; so as regards this honour I do not believe that the ladies' remuneration will be one atom lessened for not obtaining it. But pharmacists in reserving their votes will have clean hands for not being guilty of abetting them in taking a course which is universally admitted as being of questionable propriety. As the greater part of the third letter has been already dealt with whilst treating of the other two there are but a few points worthy of notice. In the first place, Mr. Senier endeavours to show the wonderful loss ladies have to sustain by not being permitted to attend the scientific and political meetings of the Society, etc. As I consider that I have already given answers to these questions or questions of a similar nature when referring to the female physicians, etc., it will be unadvisable for me to occupy any more of your valuable space than I can help. Mr. Senier informs us that he has attended classes in which females were taught and that he can speak very favourably of the general issue. As I am not able to speak as to the satisfactory or unsatisfactory demeanour of females in their various departments of labour on the other side of the Atlantic, I can direct his attention to women in this country that have achieved quite as high intellectual attainments as those in the advanced institution of Michigan; let him look at the actresses in our theatres of whom it may be said that the moral and religious character is lower than that of most ladies in other professions. The same may be observed in the gin palace and, more or less, in all places where there is an indiscriminate admixture of young men and maidens. THOMAS REECE.

48, *Great Marylebone Street, London, W., Nov.* 26.

ERRORS IN PRESCRIBING.

Sir,—The writer of the article "The Month," in the *Pharmaceutical Journal* of this date, remarks—

"There are probably few chemists who could not call to mind cases in which had the prescriptions been dispensed as written, disastrous consequences must inevitably have resulted."

I can fully endorse the justice of these remarks, and numerous cases of the kind have come under my own observation. I enclose you a copy of prescription, ordered for a young man in a delicate state of health, and imagine that had the chemist not exercised his knowledge and vigilance, the services of the undertaker would soon have been required.

Copy of prescription brought to be dispensed October 15:—

℞ Acid. Nitrici Dil.		ʒj
Tinct. Cascarillæ,		
Tinct. Zingiber,		
Tinct. Lupuli	āā	ʒiij
Aq. Laurocerasi ad		℥vj

M. Capt. pars 6tam. ter in die ante cibum.

8, *Neeld Terrace, Harrow Road.* WM. YOUNG.

EXPLOSION OF OXYGEN GAS.

Sir,—Reading the account of the late explosion of oxygen gas at Moira I am reminded of what occurred to me many years ago when preparing this gas from a mixture of oxide of manganese and chlorate of potassium in a glass bolt head cased with copper.

For some time after heat was applied there was no sign of evolution of gas and then suddenly the cork and delivery tube were expelled with a loud explosion, accompanied, as I thought, with a flash of light. I picked up the cork and delivery tube and re-inserted them into the uninjured flask when a perfect torrent of gas came off as fast as I could collect it.

I was sure, in this case, that the elastic delivery tube was pervious on commencing the experiment, and the only way I could explain the violence of the reaction was on the theory that suddenly a large volume of gas was set free from the chlorate and hence the explosion.

JOHN C. THOROWGOOD, M.D., F.R.C.P.

Welbeck Street, November 21, 1877.

TINCTURE OF QUININE.

Sir,—May I suggest that in the preparation of tincture of quinine the hydrochlorate of quinine is in every respect superior to the sulphate? It dissolves *at once* in the tinct. of orange peel and is immediately ready for use without even filtering, making a permanently clear solution. A reduction of one tenth should be made in the quantity used as it contains a larger proportion of alkaloid.

I think the hydrochlorate of quinine might with advantage have a place in our next Pharmacopœia; it is fairly soluble in cold water and for many purposes a more convenient salt than the sulphate.

As "soluble quinine" I supply it to my customers and find it is appreciated.

Scarbro', November 24, 1877. JOHN WHITFIELD.

Wholesale.—Try ordinary flour paste, with as much dilute sulphuric acid added as will give it a strongly sour taste.

F. Y. R.—(1) Brilliantine: a solution of castor oil in eau de Cologne, 1 in 4 (Beasley). (2) Syr. ferri et calcis lactophosphatis: see vol. vi. of present series, p. 883.

"*Ignoramus.*"—The green colouring matter is soluble in spirit, and therefore should not be absent.

J. H.—The proportion of potash contained in wood ashes varies very considerably, according to the plant from which they are obtained and other circumstances. A series of tables is given in Richardson and Watt's 'Chemical Technology,' vol. i., part 3, p. 447.

Omega.—Rub the powder with a little of the water first, so as to form a paste, and then add the remainder.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Bate, Mr. Price, Dr. Symes, Professor Prescott, Mr. Mackay, Mr. Kinninmont, Mr. Burgess, Mr. Edwards, Mr. Phillipps, Mr. Stokoe, Occidens, Soft, L. J. R., J. C. H.

NITRITE OF ETHYL.*

BY JOHN WILLIAMS, F.C.S.

At the last Evening Meeting of this Society, Mr. Rimmington made an interesting communication upon the subject of Sweet Spirit of Nitre. Still, more interesting perhaps was the discussion which ensued; at any rate, I was much struck by the remark of Professor Attfield, that the oily liquid separated by a saturated solution of chloride of calcium from spirit of nitre, as directed in the Pharmacopœia, did not represent simply nitrite of ethyl, as might be inferred from the Pharmacopœia, but was a liquid of a very composite character, the nature of which he declared his inability to define. His remarks also tended, I thought, to disparage the value of spirit of nitre altogether as a medicine. Professor Redwood, on the contrary, remarked that as nitrite of amyl was known to possess great medicinal power it was fair to infer that the nitrite of ethyl was also a body of considerable power, and that the old remedy of sweet spirit of nitre had not gained its popular reputation without a cause.

It struck me that a short paper upon nitrite of ethyl, and its mode of preparation in a pure state, might prove of interest and tend to clear up some of the contradictory statements frequently made regarding the nature and properties of sweet spirit of nitre. Nitrite of ethyl can be prepared by the Pharmacopœia process, but is best made by passing nitrous acid gas into alcohol. The nitrous acid gas is prepared by acting upon such bodies as starch, copper, mercury or arsenious acid with nitric acid. I need not dwell upon that part of the process. The alcohol is generally recommended in the text books to be diluted with half its bulk of water; this, however, is I consider a decided mistake. The alcohol should be as concentrated as possible, even absolute alcohol is preferable. The main points to be attended to are that the current of nitrous acid gas should be slow and steady so as to give time for the reaction to proceed properly, and that the vessel containing the alcohol should be kept as cool as possible; in this way much of the production of bye-products will be avoided, and the gas can be passed through the alcohol as long as it continues to be absorbed.

The resulting liquid (of which a sample is on the table) is anything but pure; it contains much nitrite of ethyl, some aldehyde, acid,—it is even stated to contain malic acid. In fact, it is well known that the reaction between the nitrous acid and such products as alcohol, however pure, is not sharp, but is always accompanied by secondary products.

Thus amyl alcohol, even when as pure as can be made, yields under like circumstances in addition to nitrite of amyl a number of substances, some boiling up to 200° Cent., and it appears some cyanogen compounds. This subject is, however, being investigated by Mr. Miles Smith, and will probably form the subject of an interesting communication.

It may be remembered that in a former edition of the 'Edinburgh Pharmacopœia,' sweet spirit of nitre was ordered to be prepared by passing the gas evolved from a given quantity of starch and nitric acid into a known quantity of spirit of wine. The product was not however found satisfactory as a medicine, and must have been a very impure preparation.

From the crude alcoholic solution obtained by the method I have described, the pure nitrite of ethyl can be obtained without difficulty. Nitrite of ethyl is an extremely volatile liquid; it boils at about 61° F., whereas aldehyde boils at 90° F., and alcohol at 180° F. Taking advantage of this fact we are able to separate it from the crude liquid by distillation. Some precautions, however, are necessary to ensure the purity of the product. The flask containing crude product is placed in a water-bath, and connected by bent tubes with several other flasks and bottles. The first tube should be passed into a small empty flask, this will condense most of the alcohol which may pass over during the operation. Then a second bent tube passes into a second flask containing a little water; this condenses any alcohol which may not have been stopped in the first flask, together with free acid and nearly all the aldehyde. From this wash bottle a third tube proceeds into a somewhat shallow flask, containing a strong solution of caustic potash; the gas is, however, not allowed to pass through this alkaline liquid, but simply over the surface. In this way the last portion of aldehyde is absorbed, and the potash solution gradually assumes an amber colour. From this vessel the gas (for such at the ordinary temperature of the laboratory the nitrite of ethyl is—in very cold weather it would be necessary to gently warm the different flasks) is passed through a tube charged with anhydrous chloride of calcium to absorb moisture, and the pure and dry nitrite of ethyl thus produced finally passes into alcohol, which readily absorbs it. It is only necessary to note the weight of the alcohol used for absorbing the gas and its weight at the end of the operation to know the strength or percentage of nitrite of ethyl which must be in solution. Thus if 9 oz. alcohol becomes 10 oz. it is evident we have a solution of 10 per cent.; if it becomes 12 oz., then the strength must be 25 per cent. and so on. Specimens are on the table of 5, 10, 25, and 50 per cent. solutions thus obtained. Ordinary spirit will answer for condensing the nitrite of ethyl, but it is better to use absolute alcohol, as it is very desirable to avoid the presence of water in any form. The solutions made with weaker spirit soon turn acid; those made with absolute alcohol, on the other hand, keep a long time. It is true the very strong solutions of 50 and 25 per cent. show traces of acidity when tested with moistened litmus paper, but the 10 per cent. solution is quite neutral.

One point I have not mentioned; it is that the distillation must be conducted at the very lowest possible temperature; in fact, the water in the water-bath should only be kept gently warm, and the process should be continued only so long as the conducting tubes feel cool to the touch; when they become warm the distillation should be discontinued. By passing the gas into a tube in a freezing mixture, instead of into alcohol, the pure nitrite of ethyl is readily obtained in a liquid form; it is, however, necessary to seal the tube, otherwise the very volatile liquid would soon be lost.

These solutions of nitrite of ethyl in absolute alcohol possess the following characters:—The 50 and 25 per cent. solutions as already mentioned are slightly acid, the 10 and 5 per cent. are neutral. They are not coloured brown by caustic potash, even when boiled. The sp. gr. is as follows:—

At 60° F.	10 per cent.	·810
	25 „	·824
	50 „	·850

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Dec. 5, 1877.

When treated with saturated solution of chloride of calcium, as sweet spirit of nitre is ordered to be tested in the Pharmacopœia, the following results are obtained:—

The 50 per cent. gives a separation of 48 per cent. of oily liquid by measure.
The 25 per cent. gives quite 23 per cent.
The 10 per cent. gives only 5 per cent.
The 5 per cent. gives a thin but decided oily film, not quite sufficient to measure, but quite tangible.

Now when we consider that the nitrite of ethyl is a heavier body than the alcoholic solution tested, it having a specific gravity of ·947, it appears that the stronger solutions yield very nearly, if not quite, the whole of the nitrite in a free state, but the 10 per cent. solution suffers a loss apparently of about 40 per cent., and the 5 per cent. solution of nearly the whole of the nitrite.

This 5 per cent. solution appears to represent (supposing the active medicinal ingredient of sweet spirit of nitre is nitrite of ethyl) the strength of the best samples of sweet nitre obtainable in the shops of London. I need hardly remind the meeting that many samples, even when obtained from first-class houses, yield no trace of oily stratum, and only a few yield sufficient to indicate its existence, and so clearly is this fact recognized that it has had much to do with giving rise to the doubt as to the nitrite of ethyl being indeed the active ingredient of spirit of nitre.

As some precautions are necessary in applying the test of the chloride of calcium solution, it may not be out of place if I here give my experience of the matter. It must be remembered that when the solutions of nitrite of ethyl and chloride of calcium are mixed considerable elevation of temperature takes place, and unless care be taken some of the very volatile nitrite of ethyl will certainly be lost. Even under the best conditions it is probable some loss occurs. I employ a tube of 27 inches long and about $\frac{5}{8}$ in. in diameter, sealed at one end and divided into two unequal portions; one, the lower division, being of twice the capacity of the upper and containing 400 grains; the upper division containing 200 grains is also graduated into 2-grains divisions—thus each graduation represents one per cent. of the oily liquid which may separate. The solution of chloride of calcium is poured into the tube until the proper mark is reached; the solution of nitrite of ethyl (or spirit of nitre as the case may be) is then gently poured on the top to the proper point; the tube is then corked, but not too tightly, for fear of its bursting. The tube should now be placed under a tap of running cold water and gently inverted, and then in about a minute reversed, and this repeated very slowly and with the stream of water constantly passing over the tube several times; in about three minutes the two liquids will have been sufficiently mixed and the nitrite of ethyl separated as an oily liquid floating in the upper part of the tube; but even when this operation is most carefully conducted it is probable some loss of the volatile liquid is incurred.

The principle I have explained in this paper of distilling pure dry ethyl nitrite into a known weight of alcohol, noting the increase in weight and so obtaining solutions of definite strength, is very applicable to other substances. Thus nitrite of methyl, a body boiling at −12° Cent. or 17° Fahr., and therefore a permanent gas in our climate, can readily be prepared in the same manner and in the same apparatus as I have described in this paper, substituting methyl for vinic alcohol; the gas is very soluble and easily absorbed by alcohol. A solution is on the table of 10 per cent. strength. Chloride of ethyl also, another highly volatile liquid, boiling at 12·5° C., can be absorbed. A solution of this substance of 20 per cent strength is also on the table.

Aldehyde also by taking suitable precautions, which I need not here describe, is easily procured as a pure dry gas, and can be condensed in alcohol. A solution thus made of 25 per cent. is on the table. When this solution of aldehyde is shaken with twice its weight of concentrated solution of chloride of calcium no separation of any oily liquid takes place, but the two liquids mix without change; in this differing materially from the nitrite of ethyl.

In this paper it will be observed I have only incidentally alluded to sweet spirits of nitre, and the process for making it as given in the Pharmacopœia. I think it must be apparent that we never can hope to obtain a perfectly definite and constant product by any such process as that hitherto recognized for producing that article. Mixing certain ingredients in a retort and distilling something out is not exactly a process which modern chemistry can recognize as a proper one if a definite product is desired. The product will vary, even if the proportion of ingredients be kept exact, by many circumstances—the quantity acted upon, the temperature at which the process is carried on, even shape and kind of apparatus would all have an effect in altering the nature of the product.

Perhaps the day may come when pharmacists will be required to produce active medicines in a pure and definite form; then some such process as the one I describe may be employed for such bodies as compounds of ethyl, etc. I think there is good evidence that even now medical science requires more exact pharmaceutical preparations than heretofore. The great use made of the vegetable alkaloids in preference to the raw drugs from whence they are obtained, and the increased use of definite chemical products in place of the uncertain vegetable infusions and extracts of past times, is I think a proof of the change to which I allude.

It may be objected that such preparations would be more expensive; that would probably be the case, but I do not think such a circumstance should be allowed to have weight in considering this question. When life or health is concerned it is surely not too much to use our best and utmost power to produce the medicine which will most certainly produce the desired effect. And again, should the time ever arrive when such preparations are demanded on a large scale for medicinal use, or even become officinal, competition may be trusted to reduce the cost of producing such products to a fair and reasonable level.

I cannot conclude without expressing my thanks to Mr. Miles Smith, to whose suggestions I am much indebted, and who has most carefully prepared the various solutions I have been able to place on the table this evening.

[*The discussion on this paper is printed at p.* 453.]

THE COLOUR OF PODOPHYLLUM RESIN.*

BY DR. A. SENIER, F.C.S., AND A. J. G. LOWE,

Assistants in the Laboratories of the Pharmaceutical Society.

Resin of podophyllum is described in the British Pharmacopœia as "a pale greenish-brown amorphous powder." In commerce it is found to vary much in colour, from different shades of yellow to brown and green. The question from a pharmaceutical point of view is, Does the colour indicate difference of composition or of strength and is it admissible to use specimens different in colour to that described in the Pharmacopœia?

In the case of three commercial specimens, which we will call *a*, *b*, and *c*, *a* was of a deep orange-brown colour, *b* a yellow-chrome, and *c* a bright lemon-yellow. It was noticed as significant that the dark *a* was about twice the density of the light *b*. This difference in density led to an examination of physical differences. The microscope showed that the particles of resin constituting the dark and heavy *a* were decidedly larger than those of the pale yellow and light *b*. By trituration, the dark *a* was obtained of a much lighter colour, approximating the pale yellow *b*. By fusing *a* in water and coarsely powdering the deep brown mass a darker colour was obtained. Fused and treated in the same manner, pale yellow *b* gave a resin like that from *a*. By further triturating the dark powders obtained, colours successively lighter were produced until pale yellow *b* was again approximated. Commercial specimen *c* was subjected to the same treatment, the results agreeing with those from *a* and *b*.

A was next dissolved in rectified spirit and the concentrated tincture dropped rapidly into water well agitated. Volumes of water, varying from two to twenty, were employed. The resins washed and dried over sulphuric acid were all of a light yellow colour. That from twenty volumes was the lightest, and was identical in appearance with commercial specimen *b*. A solution of *b* in rectified spirit was then precipitated by means of water acidulated with hydrochloric acid—the strength ordered by the British Pharmacopœia. Using two volumes of acidulated water, a resin was obtained darker than *a* and about the same colour as that produced by fusion and slight trituration from either *a* or *b*. All the dark specimens were found to be heavy and all the pale specimens light.

It is well known that water precipitates the resin slowly and imperfectly, while acidulated water precipitates it rapidly and completely. We may add that small proportions of water precipitate the resin in a much finer state of division and of a much paler colour than the same proportions of acidulated water. It is stated by several writers that washing with hot water deepens the colour of the resin. We can confirm this, and find it to be due to partial fusion and agglomeration of the particles.

We found then that dark specimens of resin might be made darker or lighter, and light specimens darker by suitable physical treatment. These facts led us to conclude that the sizes of the resin particles and consequent variation in density of the powder was probably the whole cause of the difference in shade observed in commercial resin; and that in this respect resin of podophyllum was analogous to common resin, which may be obtained of shades varying from deep red to nearly white by different degrees of comminution. We speak of shade as distinct from colour because difference of comminution does not account for variations in colour, which in commercial specimens is a matter less noticeable and of much less importance to the pharmacist.

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Dec. 5, 1877.

It was next decided to make synthetical experiments with tincture of may-apple rhizome itself, to try the effect of different proportions of water or acidulated water in the precipitation and also to try the effect of varying the strength of the tincture employed. For the preparation of the tincture of may-apple rhizome of commerce we are indebted to the kindness of Messrs. Godfrey and Cooke. The directions of the Pharmacopœia were followed and the tincture obtained was concentrated—every 2500 c.c. being reduced to 365 c.c. In the following experiments the resin was collected, washed, and dried, either by simple exposure to the air or over sulphuric acid. Distilled water was used throughout.

No. 1.

Concentrated Tincture	1 part.
Acidulated Water	2 parts.

No. 2.

Concentrated Tincture	1 part.
Water	2 parts.

No. 1 gave a dark brown resin, somewhat darker than the dark commercial specimen *a*. No. 2 was pale buff, a trifle denser than commercial specimen, *b*.

No. 3.

Concentrated Tincture	1 part.
Acidulated Water	10 parts.

No. 4.

Concentrated Tincture	1 part.
Water	10 parts.

No. 3 was a shade lighter than No. 2 and almost white compared with No. 1. No. 4 was lighter than No. 2, and pale yellow.

No. 5.

Concentrated Tincture	1 part.
Acidulated Water	20 parts.

No. 6.

Concentrated Tincture	1 part.
Water	20 parts.

No. 5 corresponded in colour with No. 3, and No. 6 with No. 4. The density of each was found to be decidedly less than that of light commercial specimen *b*.

No. 7.

Concentrated Tincture	1 part.
Acidulated Water	3 parts.

No. 8.

Very Dilute Tincture	1 part.
Acidulated Water	3 parts.

No. 7 is the form directed by the British Pharmacopœia. It produces a mass, which when coarsely powdered gave a heavy deep brown resin. A lighter colour was obtained by further trituration, but we never succeeded in obtaining the colour described in the British Pharmacopœia. No. 8 was only a shade lighter in colour. Solutions of Nos. 1 and 5 were then made in rectified spirit (1 to 10), and precipitated by small and large quantities of acidulated water. The resins obtained from both tinctures, so far as shade was concerned, were the same; that is one from each was light like No. 5, and one from each was dark like No. 1. These synthetical experiments go to confirm the previous ones that difference in shade depends upon the state of comminution,—that the pale coloured resins are light in density and are composed of small particles, while the dark coloured resins are heavy and composed of larger particles.

Concerning the colour of the resins as distinct from shade the above experiments furnish a few points to be noticed. Using large quantities of water or acidulated water as in Nos. 3—6, no difference in shade was noticeable and the state of division was about the same. In Nos. 4 and 6, where water alone was employed, there was a distinct yellow colour, which was more or less transformed into a buff in Nos. 3 and 5 where large proportions of hydrochloric acid water were used. This was most evident where Nos. 1 and 5 were redissolved and again precipitated from a large quantity of acidulated water; in the last case a green tint appeared. The distinct yellow tint in Nos. 4 and 6 was most evident in those portions which were the last to subside and was due probably to the slow separation of the natural compound of the yellow colouring matter which exists in the rhizome. It is not due, as will presently appear, to the separation of a salt of berberina, as some have supposed. In regard to the presence of berberina, Wood* says that muriate of berberina imparts its colour to the resin of the British Pharmacopœia. Maisch† says that berberina which had been stated by Mayer‡ to exist in may-apple rhizome may occur in the resin, especially when it is precipitated from water acidulated with hydrochloric acid. In view of these statements we examined resins *a*, *b* and *c* for berberina by washing them with hot water, concentrating the filtrates and treating separate portions with hydrochloric acid (Maisch), potassium mercuric iodide and other alkaloidal reagents. In every case the result was negative even after standing. The same result was obtained from resins of our own manufacture and from large quantities of concentrated filtrate after removal of resin.

In a paper before the last meeting of the American Pharmaceutical Association, at Toronto, an abstract of which has lately appeared, Mr. Power reports the absence of berberina in the rhizome. Professor Maisch in the discussion which followed is reported to have said that only in some cases were traces of alkaloid found. In the case of three samples of resin examined by Beach,§ two were found to contain traces of alkaloid. The probability is that the presence or absence of berberina in the rhizome is variable and that it never occurs in large quantity. Traces only may, therefore, sometimes be expected in the resin. At all events we are justified in saying that the yellow colour of some specimens of resin is not due to berberina. It is due doubtless to the acid colouring matters of the rhizome, and may be heightened by the use of certain solutions instead of water or acidulated water. Alum water gives a bright yellow resin, as was pointed out by Professor Maisch at Toronto. The use of alum, however, increases the ash. In one experiment we found the ash to be ·8 per cent.,‖ whereas the resin made by us with water or acidulated water never gave more than ·1 per cent.; this small proportion of ash always contained phosphates. We have examined the ash of several commercial samples, with the following results, expressed in percentages:—2·4, 2·5, 1·, 1·2, 1·6, ·5, ·2, and 4·1.

Some of these ashes point to the use of solutions of alum or other substances, whilst the rest are probably due to different sources of contamination. We have now pointed out some of the possible causes of the variations in colour observed in podophyllum resin. That these changes of tint do not affect the activity of the resin may be taken as certain. With the exception of the alum water experiment, the processes producing them are covered essentially by the official processes of the United States Pharmacopœias of 1860 and 1870, and that of the British of 1867. We have, however, obtained confirmatory physiological evidence in the case of experiments made upon ourselves. The bright yellow resin obtained by the use of alum water was also tried physiologically and found to be equally active.

It appears, then, that the variations of shade and colour seen in commercial podophyllum resin do not affect its physiological activity. There would be no disadvantage to the patient therefore if these various coloured commercial resins were substituted for the particular coloured resin ordered by the Pharmacopœia, provided, of course, that they answered in other respect the official requirements.

In conclusion, we have to express our obligation to Mr. E. M. Holmes for suggesting this investigation, and for several of the specimens examined; to Messrs. J. Moss, C. Umney, H. G. Greenish, and H. Senier, for other specimens; and to Professor Attfield for permitting the experiments to be conducted in the laboratories of the Pharmaceutical Society.

[*The discussion on this paper is printed at p.* 456.]

* 'Therapeutics and Pharmacology,' 3rd ed., II., 544.

† *Amer. Journ. Pharm.*, 1863, p. 303.

‡ *Amer. Journ. Pharm.*, 1863, p. 97.

§ Prescott, *Amer. Journ. Pharm.*, Sept. 1876. See also Busch, Nov., 1877.

‖ Busch, *Amer. Journ. Pharm.*, Nov., 1877, and *Pharm. Journ.*, before, p. 424, reports an instance of 1·25 per cent.

NOTE ON RHEUM OFFICINALE GROWN IN ENGLAND.*

BY HAROLD SENIER, F.C.S.

In the *Pharmaceutical Journal* (series iii., vol. vii., No. 364), Mr. Holmes has described the history and mode of cultivation of some plants of *Rheum officinale*, grown by Mr. Usher of Banbury, pointing out their botanical characteristics, and comparing the physical appearance of the root with that produced by the East Indian plant. Since, by the more rapid growth of this species, the yield is much larger than that of the *Rheum rhaponticum*, as grown in this country, it becomes a matter of interest to know whether it can replace this latter species commercially, and also how it varies in medicinal properties from the East Indian root, supposed to be derived from the same species.

In order to attain these objects, I first compared the powdered roots and the two simple official preparations of them, the infusion and extract.

The powders, when prepared quite dry and passed through sieves of the same fineness, show a marked difference in colour, the English *Rheum officinale* being the brightest, the East Indian coming next, and lastly *Rheum rhaponticum*.

The infusions, when prepared according to the

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Dec. 5, 1877.

British Pharmacopœia, vary but little in colour, that from the English *officinale* being a little darker than the other two.

The extracts.—The amounts of extract derived from the three varieties were estimated first by manipulating in the manner directed in the British Pharmacopœia, and, secondly, by using rectified spirit in place of the weak spirit ordered in the preparation of the official extract. In each case average portions of the roots were reduced to an equal state of comminution and the greatest care taken that each sample should be acted upon by the solvent in the same degree. Operating in this way I obtained by the official process from the East Indian root 45 per cent., from *Rheum rhaponticum* 29 per cent., and from the English *Rheum officinale* 25 per cent. of dry extract.

By using rectified spirit as the solvent, I obtained from the East Indian root 38 per cent., from *Rheum rhaponticum* 21 per cent., and from English *Rheum officinale* 17 per cent. of dry extract. This latter extract I believe to be a more reliable basis of comparison than that obtained by the process of the British Pharmacopœia, insomuch as it contains all the supposed active principles of the rhubarb (notably chrysophanic acid, emodin, rheotannic acid, and a resinous body, phœoretin), minus a certain quantity of albuminous matter.

The ash was estimated in order to obtain an idea of the quantity of oxalate of calcium present in the root, and gave the following results:—East Indian 12·72 per cent., *Rheum rhaponticum* 7·9 per cent., and English *Rheum officinale* 4·66 per cent. These results point to the conclusion that the root of *Rheum officinale* is of less commercial value than that of *Rheum rhaponticum*, and are what one might expect from the rapid growth of the root—this particular sample being produced in about three years; so that if this species does produce any of the foreign rhubarb of commerce, its growth must become much less rapid after a certain age. But it does not necessarily follow that because the root yields less extract, that it is of less medicinal activity than the East Indian root, and in my own experience, I have found a ten grain dose of its extract produce a very decided cathartic effect. This, however, is a point which can only be decided by experiments on a large number of patients, and must be left to the medical profession to determine.

In conclusion I must express my thanks to Mr. Holmes, who has kindly provided me with the necessary specimens of rhubarb, and to Messrs. Godfrey and Cooke for permission to make the experiments in their laboratories.

St. George's Place, London.

[*The discussion on this paper is printed at p.* 456.]

FALSE ANGOSTURA BARK AND BRUCIA.*

BY W. A. SHENSTONE, F.C.S.

I. In the course of the work described in this paper it has frequently been necessary to repeat the fundamental experiment employed in my investigation upon the action of nitric acid on brucia. All my results have been concordant with those formerly obtained; invariably when brucia from ordinary sources is treated with 5 per cent. nitric acid, and the product rendered alkaline and extracted with chloroform, a residue is obtained on evaporating the chloroform, which consists of nearly pure strychnia; with equal regularity I find that after careful purification of the brucia the amount of strychnia obtained is very small, though to attain absolute purity is a matter of considerable difficulty. As strychnia is destroyed by rough treatment with even so weak an acid as the above, these statements only hold provided the operation is performed with due care; on the other hand, by the exercise of this care the process becomes an excellent method of detecting, and even of estimating strychnia in brucia; indeed, I have been unable after many efforts to devise any plan equally satisfactory, and I now habitually use it in the examination of brucia, though, as I am not unconscious of the objections to it, I only adopt it provisionally as the most delicate method I am at present acquainted with.

My exact method of working is as follows: about ·5 gram of brucia is placed in a test-tube with 3 or 4 c.c. of the dilute acid, and warmed rather gradually by immersion in a beaker of hot water, effervescence occurs, and presently yellow crystals of cacotheline are deposited. Directly these make their appearance solution of potassium hydrate is added in excess, and the mixture is cooled by placing the test-tube in cold water; it is then extracted by agitation with chloroform, and the residue obtained by evaporating the chloroform is tested in the usual way. When the amount of strychnia is small, it is necessary to char the residue with sulphuric acid before testing it, as the chloroform usually extracts a small quantity of a resinous substance which masks the reaction of the strychnia. I find this interfering substance is, to a great extent, removed by washing the chloroform with a small quantity of water, to which a drop of solution of ammonia has been added.

I have employed the above method in examining quantitatively four specimens of brucia, obtained from sources of high character, with the following results, which may be regarded as indicating the condition of the best brucia ever employed in pharmacy:—

In cases II. and IV. two experiments were made on two portions of the same sample.

I. Reported in a former paper contained 1 to 1·5 per cent.

II. (*a*) ·687 gram of brucia gave ·003 gram = ·43 per cent. of strychnia.

(*b*) ·860 gram of brucia gave ·004 gram = ·46 per cent. of strychnia.

III. ·859 gram of brucia gave ·009 gram = 1·05 per cent. of strychnia.

IV. (*a*) ·629 gram of brucia gave too little to be worth weighing, apparently under ·25 per cent. of strychnia.

(*b*) ·538 gram of brucia gave too little to be worth weighing, apparently under ·25 per cent. of strychnia.

In all the above cases the strychnia obtained was of a pale straw colour, and free from brucia,

II. It will be observed that in only one of the four samples examined was the amount of strychnia sufficiently small to be at all unimportant, when we consider its great activity. This induces me to mention my present method of purifying brucia, the method indeed by which I propose to purify a supply for experiments upon its physiological action; it has several advantages over the process of frac-

* Read at an Evening Meeting of the Phaamaceutical Society of Great Britain, Dec. 5, 1877.

tional precipitation I have previously suggested and employed, though in principle the two plans are alike. I now crystallize the brucia by cooling a solution of it in boiling water to which a few drops of acetic acid have been added, and I find that one crystallization has considerably more effect in removing strychnia than a single precipitation; it also entails less loss (at any rate on a small scale), is less troublesome, and yields the alkaloid in a much better condition. It is, however, imperative, for reasons given later on, to avoid applying prolonged heat to a solution containing brucia, in this or in any other part of its manufacture or purification.

In connection with this process, I may mention that the relative solubilities of brucia in hot and cold water are generally inaccurately stated; usually it is said to dissolve in 850 parts of cold, or 500 parts of hot water. This is very far from being correct. Hanbury, in 'Pharmacographia,' states that one part dissolves in 150 parts of boiling water, which, as far as my experience goes, is much nearer to the truth; I have not attempted an exact verification, however, on account of the difficulty of obtaining a really saturated solution, and of the rapid alteration to more soluble bodies which brucia undergoes when heated with water. I have alluded to this, because the convenience of my process of purification depends upon Hanbury's expression of the solubility being more nearly correct than the general one.

III. In the discussion on a paper of mine, read at an evening meeting in February, 1877, some curiosity was expressed as to the presence of strychnia in false angostura bark. This same question had for some time been interesting me; I had, indeed (through the kindness of Messrs. P. W. Squire and Son), a small supply of the bark in my possession, which I had reserved from a large quantity that had been used in an unsuccessful attempt to prepare pure brucia for my examination of the "conversion into strychnia" question, and which I had decided to devote to an examination for strychnia.

It is impossible to detect strychnia by its ordinary reaction with bichromate and sulphuric acid in the presence of any quantity of brucia, even if other organic substances are absent. I have, however, succeeded in isolating strychnia from strychnos bark, by the following modification of the process employed by Pelletier and Caventou, in the research by which they discovered the, then new, active principle, brucia. These investigators commenced their examination of strychnos bark with the expectation of extracting strychnia from it; that they failed to do so is not surprising, for they had themselves quite recently discovered strychnia, and were only aware of its more obvious properties, and consequently had not the necessary knowledge for separating it when in very small quantity.

Three and a-half ounces of the bark was exhausted by roughly powdering and repeatedly boiling with fresh portions of rectified spirit; the various alcoholic decoctions so obtained were united and the spirit distilled off, the residue was diluted with water, and evaporated to a small bulk to remove the last traces of spirit, again diluted, warmed and after cooling filtered; to the filtered solution excess of subacetate of lead was added to precipitate colouring matter, which was filtered off, and lead removed from the filtrate by a current of sulphuretted hydrogen; after boiling to expel excess of this gas, the liquid was boiled with magnesia, filtered, and the residual magnesia well washed with boiling water, the washings being added to the filtrate; the mixed filtrate and washings were evaporated to dryness,* the residue dissolved in acidulated water, and the acid solution, rendered alkaline by ammonia, was repeatedly washed with ether; the ethereal solutions were combined and distilled, and the extract which remained after distillation was treated for some hours with sulphuric acid on a water-bath, then diluted, and after addition of excess of ammonia again extracted by agitation with ether; this ether on evaporation yielded a residue, which though not colourless gave ample indication of consisting largely of strychnia. The impurities appear to be, a trace of brucia, and a resinous body, difficult of destruction, which at first prevented the strychnia from crystallizing, though I afterwards succeeded in obtaining the hydrochloride in the crystalline form. These impurities might probably have been removed by treatment with weak nitric acid, but when I did the above work I was not so well acquainted as I am now with that method, and I adopted the safer, though less delicate, process of extracting with ether from an alkaline solution, in consequence of having previously observed that this solvent will to a considerable extent separate the two alkaloids if there is as much as one or two per cent. of strychnia in a mixture of them; generally the strychnia is accompanied by a small quantity of brucia.

False angostura bark does therefore contain strychnia, though only in small quantity. The statements to the contrary in Watt's 'Dictionary' and elsewhere are doubtless due to the unsuccessful attempt to extract it of Pelletier and Caventou.

The brucia whose physiological action was examined by Pelletier and Caventou was prepared from this source, and therefore probably contained strychnia, and, from the results of my examinations of commercial brucia, and the varying reports of the degree of its activity given by investigators, I have come to consider it very doubtful if the physiological effects of *really pure* brucia have ever been studied, and to think it not impossible that the strong resemblance of its action to that of strychnia may even be due to the proportion of strychnia which it contains. I have reason to hope that this interesting question will before long be thoroughly investigated.

IV. When purifying brucia by crystallization from boiling water to which a few drops of acetic acid had been added, I was not at first aware of the extent of its solubility, and I hoped to avoid the loss, which otherwise seemed unavoidable, by employing the mother liquor from each crop of crystals for a fresh crystallization. Operating in this way I obtained two yields of nicely pure brucia; but subsequent products were somewhat dark coloured, and the loss was greater than I anticipated from the solubility of the alkaloid in cold water. Hoping to recover some of this loss I left the mother liquors, which had now

* During an unavoidably prolonged absence at this point the water-bath employed for the operation went dry, and the part of the residue nearest the bottom of the dish was a little charred. Whether any serious loss of strychnia resulted I am unable to say. I state the circumstance as it may be that the amount obtained at the end of the experiment is not even the greater part of the total quantity in the bark, though considering the difficulty of destroying strychnia by treating with sulphuric acid, and the degree of the charring, I am of opinion that the loss was not considerable.

rather a dark colour, to spontaneous evaporation during a period of eight weeks in the warm weather of the summer, and, meanwhile, met with the investigations of the "Aconitine Committee" on the saponification of that alkaloid, and of Buchheim on similar operations with atropia. Consequently, I was not surprised to find after this interval that the fluid, which I now first noticed to have a strongly acid reaction, had deposited fine crystals of a brown colour. I obtained a further quantity of the same substance in smaller crystals by evaporating to a small volume; and finally by evaporating to dryness I got a mass of a darkish yellow deliquescent solid.

As far as I have examined them these bodies have the following properties:—

The brown crystals.—Soluble in hot, less so in cold water, freely soluble in alcohol, insoluble in ether, contain nitrogen, reddened by nitric acid; an aqueous solution gives with ammonia a white precipitate, which also is reddened by nitric acid. Probably, therefore, this is a new salt of brucia, though the base is not necessarily brucia, as other bodies, viz., the igasurines, are affected like brucia by nitric acid.

The yellow substance.—Chiefly soluble in water and spirit, not reddened by nitric acid, had an acid reaction,* is precipitated in crystals from solution in spirit by the addition of an equal volume of ether, slowly changes colour on exposure. In some respects, but not in all, it resembles Ludwig's igasuric acid.

When brucia is boiled for some hours with a solution containing rather more than 1 per cent. of caustic potash, the solution gradually becomes yellow, and after filtering and evaporating over sulphuric acid *in vacuo* yields some bright, pale yellow crystals, soluble in alcohol, reddened by nitric acid, and which on crystallizing from weak spirit are more or less completely changed to white silky crystals, an alteration which may be due to an altered state of hydration. After removing this body, I have not yet succeeded in separating any other satisfactory substance from the mother liquor.

By boiling with distilled water brucia rapidly becomes much more soluble. Fifteen grams, after boiling with rather more than a litre of water for forty-eight hours ceased to crystallize on cooling, and after continuing the ebullition for twenty hours longer was still strongly alkaline, and gave on evaporation a mass of a dirty brown substance, reddened by nitric acid, and apparently readily soluble in alcohol and rather less so in water. I have not further examined it at present.

I have given an account of these, so far, very incomplete experiments, which I have been compelled to put aside during the past two months, on account of their interest from a manufacturer's point of view. The readiness with which brucia seems to undergo alteration by heating with pure, slightly acid, or slightly alkaline water, rendering it very important to perform all operations of this nature in its preparation with as little heat and as much speed as may be.

I shall proceed very shortly with the examination of these reactions and their products, and of some analogous ones which I have reason to think strychnia takes part in.

[*The discussion on this paper is printed at p.* 456.]

* May have been due to acetic acid which was set free during the latter part of the evaporation of the solution which yielded this.

OBSERVATIONS ON RUSSIAN TURPENTINE OIL, AND ON OLEUM FOLIORUM PINI SYLVESTRIS.*

BY WILLIAM A. TILDEN, D. SC.

I have lately had an opportunity of examining a specimen of Russian turpentine oil, and inasmuch as it differs materially from ordinary American, as well as from the French oil, it occurred to me that the attention of pharmacists should be directed to the matter.

The crude oil possesses an odour which is quite distinct from that of ordinary turpentine oils, and is strongly suggestive of "pitch-pine" wood and sawdust.

Its specific gravity at 15° is ·8682, and it turns the plane of polarization of a ray of polarized light to the right. After shaking up with solution of soda to remove acetic acid and empyreumatic products, a quantity of the oil was submitted to distillation. The following products were received separately:—

	ozs.
(*a*) Came over at 160° C. to 171° and was rather turbid from presence of water	1
(*b*) At 171°—172°	$6\frac{2}{3}$
(*c*) At 172°—185°	$2\frac{1}{2}$
(*d*) Residue boiling at 185° and upwards, bright yellow, and rather viscid when cold	$\frac{1}{2}$
	$10\frac{2}{3}$

By far the greater part is thus found to pass over at a temperature from 14° to 15° higher than the boiling point of ordinary turpentine oil.

By careful fractional distillation and examination of the products the constituents of this oil are found to be:—

a. A liquid having the same composition and nearly the same properties as common turpentine oil, but having a stronger action on polarized light.

b. A liquid having the same composition as turpentine oil, but boiling at 171-5°, or thereabouts.

c. High boiling hydrocarbons, polymeric with turpentine oil; a small quantity only.

Complete details as to the chemical composition and properties of the new hydrocarbons will shortly be published elsewhere.

For the present it is sufficient to say that they are probably identical with the compounds recently extracted from Swedish turpentine oil by Atterberg (*Deut. chem. Gesell. Ber.*, x., 1202); but that the properties assigned to them by that chemist do not quite agree with those observed by myself as belonging to the Russian oil.

In order to render Russian turpentine oil available for pharmaceutical purposes, to which its fragrant odour specially commends it, it is only necessary to shake it up with solution of soda, to separate it, and then re-distill either alone or perhaps better in a current of steam.

From the presence of empyreumatic products in the crude oil, there can be no doubt that this oil is not procured by exudation from the living trees, but is a product obtained in the distillation of tar from the wood of various coniferæ. According to Hanbury and Flückiger the *Pinus sylvestris*, or so-called Scotch pine, is chiefly employed for this pur-

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Dec. 5, 1877.

pose in the north of Europe. I am informed that comparatively little of this oil reaches the English market; but since its production in Russia is carried out upon a very large scale, I believe there would be no difficulty in procuring the importation of any desired quantity should a demand for it arise.

Since this matter was in my hands I have thought it worth while to examine the oil distilled from the leaves of the *Pinus sylvestris* which has lately been introduced into pharmacy, and with this object I applied to Mr. A. W. Postans, of Baker Street, who very generously sent me a supply. The examination of this oil is not quite finished, but I may venture to refer to the few facts I have established thus far. To me they are rather interesting, for on the assumption that the Russian turpentine is obtained from *Pinus sylvestris*, I expected to find that the chief constituents at least would be the same in the two oils. But this is not the case.

Ol. Fol. Pini Sylvestris, as I received it, has a specific gravity = ·8756 at 12° C. It is dextrorotatory.

$$[\alpha]_D = +6{\cdot}2^\circ \ (\lambda = \text{decim.})$$

When distilled it began to boil below 100°, but the temperature went up rapidly to 165°. The first fractions obtained were as follows:—

	Fl. oz.
(*a*) Below 165°	1
(*b*) 165° to 175°	$2\frac{1}{8}$
(*c*) 175° to 195°	$\frac{3}{8}$
195° and upwards	$\frac{1}{4}$
	$3\frac{3}{4}$

After careful fractionation two chief products were obtained—

(*a*) Boiling at 156° to 159°; dextrorotatory; almost certainly identical with common turpentine.

(*b*) Boiling between 171° and 176°.

The small quantity of material at my command has not been sufficient to enable me to get a product of perfectly constant boiling point. But this fraction has nearly the same odour as the chief terpene from Russian turpentine, and I have little doubt it possesses the same composition. It is, however, *lævo-rotatory* in its action on polarized light. It thus seems to bear the same kind of relation to the oil from the wood of the *Pinus sylvestris* that French oil (terebenthene) bears to American (australene).

From a pharmaceutical point of view, the chief result of these observations is to indicate that neither Russian nor any other turpentine oil of commerce can be said fairly to represent the ol. foliorum pini sylv., or to be a proper substitute for it. But I believe that a preparation of Russian oil might be obtained by a single distillation, which would be found very suitable and agreeable for medicinal purposes. This, however, is a question which can only be settled by pharmacists and medical men.

[*The discussion on this paper is printed at p.* 456.]

THE USE OF RUSSIAN TURPENTINE IN PHARMACY AND MEDICINE.*

BY A. W. POSTANS.

Following up Dr. Tilden's suggestion, that the use or otherwise of Russian turpentine in medicine must now be settled by pharmacists and medical men, I turned to the Pharmacopœia of India, because it seemed to me to contain a very comprehensive account of the properties and therapeutic uses of turpentine, and there I find it stated (p. 219) that the properties of turpentine are—"Primarily—stimulant, especially increasing the quantity of urine, to which it communicates a peculiar violet odour. Secondarily—sedative, antispasmodic and astringent. In large doses, purgative and anthelmintic. Locally or externally applied, a valuable rubefacient and counter-irritant."

Therapeutic uses.—In typhus, typhoid fevers, and inflammation of the lungs. In puerperal fever it has been vaunted as a specific. It is useful also in hysteria and epilepsy, also in tetanus; and in flatulent colic it proves valuable as an antispasmodic. Amongst the other diseases in which it has been used with advantage may be mentioned the advanced stages of dysentery, gonorrhœa, dropsy, and diseases of the eye.

Dose.—As a diuretic and astringent, from eight to thirty minims; as a stimulant and antispasmodic, from ʒss to ʒj; as a purgative and anthelmintic, from ℥ss to ℥j; as a rubefacient or counter-irritant it may be applied in the form of liniment or ointment.

With this evidence before us, showing something of the value of commercial turpentine in medicine, we are led to inquire how it is that the oil of turpentine preparations have not found greater favour with the profession, and the reply I think is quite easily found from the fact that all the official preparations of turpentine (owing to the turpentine itself), are nauseating, and possessed of a most unpleasant paint-like odour, which is much objected to.

Under these circumstances, and finding on examination of the Russian turpentine that far from being unpleasant it is on the contrary possessed of a most agreeable, attractive, and aromatic odour, and by no means unpleasant taste, I have been induced to make the following preparations of the British Pharmacopœia, substituting in each case the Russian turpentine, and the result has, I think, fully justified, pharmaceutically, what Dr. Tilden has stated regarding it.

Preparations.—Linimentum Terebinthinæ; Linimentum Terebinthinæ Aceticum, known as St. John Long's Liniment; Confectio Terebinthinæ.

The paint-like odour of common turpentine oil is entirely absent in preparations made with this new Russian oil. The preparations themselves resemble in appearance the old ones, but are free from the objection before mentioned, and are indeed quite agreeable.

Before concluding I would beg to be allowed to suggest a formula for its administration internally, assuming that it may be desirable to give thirty drop doses:—

℞. Russian Turpentine	ʒij.
Mucil. Tragacanth.	ʒiv.
Pulv. Amygdalæ Co.	ʒiv.
Aq. Chloroformi . . . . . ad	℥vj.

Misce secundum artem. Ft. Emulsio.

Quarter part a dose.

This seems to be a good form for its introduction.

[*The discussion on this paper is printed at p.* 456.]

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Dec. 5, 1877.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 8, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal. MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE PRELIMINARY EXAMINATION AND ITS SUPPOSED DIFFICULTIES.

IT will be seen from the report of the proceedings at the Council meeting last Wednesday, that there is still an impression in some parts of Scotland that the Preliminary examination which candidates are required to pass is too severe, and that on this account great difficulty is to be anticipated in securing apprentices. The fact that there is a large proportion of failures among those who present themselves for the Preliminary examination appears to have been regarded by the Glasgow Chemists and Druggists' Association as indicating the possibility that the candidates at recent examinations may be inferior in education to those at former examinations, or that the examination itself is more difficult than it formerly was. But in both respects an erroneous opinion appears to have prevailed, for according to the statistics furnished by the Registrar, the average percentage of failures has been less during the present year than it was from 1873 to 1876, as shown by the following figures:—

PERCENTAGE OF FAILURES.

	England.	Scotland.	Great Britain.
1872	38·019	44·961	...
1873	48·14	41·35	...
1874	52·18	42·1	...
1875	51·81	33·64	...
1876	...	...	42·4
1877	...	...	46·

From these data it is evident that the Glasgow Chemists and Druggists' Association has been misled, and that there is no real foundation either for the belief that the standard of the examinations is too severe or for the supposition that the candidates at the present time are inferior to those of previous years. The facts indicated by the foregoing statistics constitute indeed the best and most complete answer to the questions that are put to the Council, and they are calculated, not only to allay the regret expressed by the Glasgow Chemists and Druggists' Association, but also to encourage the hope that when the necessity of the Preliminary examination as a test of educational fitness for entering upon the career of a chemist and druggist becomes more generally recognized, candidates will present themselves while still fresh from school; there will then be little fear of failing in such a commonplace ordeal.

THE RIGHT TO PRESCRIBE.

WE have been informed that an opinion is entertained by some country members of the trade that in writing the concluding paragraph of the article which appeared in last week's issue upon the Right to Prescribe we failed to understand or appreciate how much country chemists and druggists are affected by the question that has been raised in regard to that subject. We do not think it necessary to acknowledge any deficiency in that direction, or to admit that the remarks contained in the concluding paragraph of the article are in any degree speculative. The tendency of the Pharmaceutical Society as a body in regard to "counter practice" is a fact beyond question, and as a justification of our remarks we cannot do better than refer to the following passage in a paper read by Mr. T. N. MORSON, in 1841, upon "The Rise and Progress of Pharmacy":—

"It is not the wish of chemists and druggists as a body to become medical practitioners. From the nature of our elementary studies we are not likely to attain excellence in the other sphere, and by grasping at a shadow we may lose the substance. At the same time, the restrictions which some persons are anxious to place upon us in regard to recommending simple medicines are more severe than judicious, and are, in fact, impracticable."

NEW POTASH FIELDS.

THE discovery of another immense bed of potash salts near Stassfurth is announced by *Iron*. It appears that the Continental Diamond Rockboring Company, having some of its machinery unemployed, made some speculative borings at Aschersleben to ascertain the limits of the Strassfurth deposits. The borings proved the existence of thick beds of potash and soda salts, supposed to be the residue of the evaporation of an inland sea, lying within the triangle formed by the three towns of Magdeburg, Halle, and Nordhausen.

Ten kinds of minerals were met with in the borings. The first found, after passing through the salt clay, was a variety of common salt and kieserit containing 18 to 20 per cent. of chloride of potassium. This was followed in succession by carnallite (upwards of 100 feet thick in many parts), a double chloride of potassium and magnesium ($KCl \cdot MgCl_2 + 6H_2O$) and kainit, a double sulphate of potash and magnesia, combined with chloride of magnesium, ($K_2SO_4 \cdot MgSO_4 \cdot MgCl_2 + 6H_2O$). Then kieserit, a monohydrated sulphate of magnesia ($MgSO_4 + H_2O$), was found in considerable quantities, forming about 17 per cent. of all the minerals extracted; polyhalit, which is a triple sulphate of lime, magnesia and potash, ($2CaSO_4 . MgSO_4 . K_2SO_4 + 2H_2O$), was found both at the top and bottom of the potash layers: in the former in the kieserit; in the latter in the salt. Common rock salt was found below the potash layers, to a depth of more than 2000 feet, and then was not exhausted. In the carnallite and kainit layers were found sylvin, nearly pure chloride of potassium; tachydrit ($CaCl_2 . 2MgCl_2 + 12H_2O$); astrakainit, a double sulphate of soda and magnesia; ($Na_2SO_4 . MgSO_4 + 4 H_2O$), and boracit ($2Mg_3B_8O_{15}MgCl_2$).

Very liberal terms are granted under the Prussian laws to mineral explorers, and the managing director is said to have secured for the prospecting company the concession of an area of nearly twenty-four million square metres of land. It is intended to commence operations for working the beds forthwith.

A NEW CHEMISTS' ASSOCIATION IN WARWICKSHIRE.

On Monday last a well-attended meeting of chemists and druggists was held in the Mayor's Parlour, Coventry, and it was resolved to form a new Society under the name of the Coventry and Warwickshire Pharmaceutical Association, which it is hoped may "prove to be the nucleus of a local centre of pharmaceutical education." An influential council was appointed, presided over by Mr. Councillor Wyley, and the new Society has been so fortunate as to secure the services of Mr. Frederick Barrett as its first Honorary Secretary.

APOTHECARIES' OR AVOIRDUPOIS.

Several more letters upon the subject of the disputed value of the ounce sign have been received, the publication of which is necessarily deferred until next week. Amongst them is one from the Editor of the British Pharmacopœia, giving his own opinion and that of a member of the Committee as to the manner in which the instructions given in the Preface to the Pharmacopœia are to be construed. As this must be held to be fairly decisive at least of what may be called the official portion of the discussion, and a considerable latitude has already been given to the expression of individual opinion, it is not intended to publish any further correspondence upon the subject beyond what has already been received.

CHEMISTS' ASSISTANTS' ASSOCIATION.

We are glad to learn that at the meeting of the above Association, held on the 28th ult., in its new room, 29, Brewer Street, Air Street, W., there was a good attendance of members and visitors. The Honorary Secretary reported that the Association now numbered 66 members, and that the funds were in a satisfactory condition, after which a paper on "Pill Making and Excipients," by Mr. Marshall, was read. Another meeting is announced for Wednesday next, when a paper is to be read by Mr. Stuart, on "A Botanical Ramble in Cumberland."

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, December 5, 1877.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atherton, Atkins, Betty, Bottle, Churchill, Gostling, Greenish, Hills, Mackay, Robbins, Sandford, Schacht, and Shaw.

The minutes of the previous meeting were read and confirmed.

Appointment of Examiners for 1878.

The President suggested that the Council should go into Committee for the appointment of Examiners, in order that if necessary the merits of the various gentlemen whose names had been suggested might be freely discussed. This was unanimously agreed to.

The Council having resumed, and a ballot having been taken, the President declared the following Pharmaceutical Chemists to be appointed Examiners for the ensuing year, subject to the approval of the Privy Council:—

England and Wales.

Allchin, Alfred, England House, Primrose Hill Road, N.W.

Barnes, James Benjamin, Trevor Terrace, Knightsbridge, S.W.

Benger, Frederick Baden, 7, Exchange Street, Manchester.

Brady, Henry Bowman, 29, Mosley Street, Newcastle-on-Tyne.

Carteighe, Michael, 180, New Bond Street, W.

Corder, Octavius, 2, London Street, Norwich.

Gale, Samuel, 338, Oxford Street, W.

Hanbury, Frederick Janson, Plough Court, Lombard Street, E.C.

Linford, John Samuel, The Quabbs, Drybrook, Gloucestershire.

Martindale, William, 10, New Cavendish Street, W.

Moss, John, 300, High Holborn, W.C.

Southall, William, 17, Bull Street, Birmingham.

Taylor, George Spratt, 13, Queen's Terrace, St. John's Wood, N.W.

Umney, Charles, 50, Southwark Street, S.E.

Scotland.

Ainslie, William, 58, George Street, Edinburgh.

Borland, John, 7, King Street, Kilmarnock.

Kemp, David, High Street, Portobello.

Kinninmont, Alexander, 69, South Portland Street, Glasgow.

Gilmour, William, 11, Elm Row, Edinburgh.

Noble, Alexander, 139, Princes Street, Edinburgh.

Stephenson, John Bertram, 71, George Street, Edinburgh.

Young, James Robertson, 17, North Bridge, Edinburgh.

Retirement of Mr. Haselden.

The President said he could not allow the opportunity to pass without saying a word on the resignation from the Board of Examiners of Mr. Haselden from ill-health. The members of the Council were all aware that Mr. Haselden had been much affected by the death of his wife last year, and he had since suffered so much in health that he had felt unable to continue his services as examiner beyond the close of the present year. Mr. Haselden having been President of the Society, and for many years a member of the Council, nothing more need be said with regard to his good qualities. He would therefore move—

"That this Council desires to express great sympathy with Mr. Haselden in his present inability to continue his connection with the Board of Examiners, and earnestly trusts that he will shortly be entirely restored to health."

The motion, having been seconded by the Vice-President, was carried unanimously.

MEETINGS OF THE BOARD OF EXAMINERS IN 1878.

It was resolved that the examinations should be held during 1878, in February, April, June, July, October, and December in England, and in February, April, July, October, and December, in Scotland.

Mr. HILLS said he hoped the President would not forget to make arrangements for a deputation to visit the examination of the North British Branch.

Mr. CHURCHILL asked if it was proper that a young man who failed to pass in London should be allowed to go to Scotland and try.

The SECRETARY did not see that any one had any right to prevent a candidate choosing where he would be examined, provided the due interval had elapsed since his failure.

Mr. BETTY suggested that it would be well to have a return prepared next year showing the number of candidates who, having failed to pass in London, had afterwards passed in Scotland, and *vice versâ*.

The VICE-PRESIDENT said he had been informed by a young man who went from Brighton to Edinburgh with an idea that the examination was much easier there than in London, that he found this was quite a mistake.

Mr. BOTTLE, while he agreed with the plan of deputations from the two Boards visiting one another occasionally, also thought it would be well if the two Boards kept themselves a little better posted as to their own arrangements, and that no alteration should be made in the regulations without communicating from one Board to the other. He understood that the English Board had recently made a regulation not to inform a candidate who failed what subjects he had failed in. The Scotch Board, on the other hand, had still gone on in the accustomed mode of giving this information to rejected candidates.

Mr. MACKAY said he had not expected this subject to be brought forward; but as it had been mentioned he must express how much the Board in Scotland felt at such a regulation having been decided on without any communication to it on the subject. The Board in Edinburgh felt that it was unfair to a candidate who failed in certain subjects that he should not be told where his weakness lay, and that there was an inconsistency in refusing this information when at the same time a man who failed hopelessly in the first subject he attempted, was told so, and rejected at once. He believed it had been said that this rule was adopted in order to prevent unsuccessful candidates sticking very closely to those subjects in which they were low to the exclusion of the others; but he did not see any force in this objection, because the candidate knew he must pass in every subject, and the experience in Scotland was that those who had failed in certain subjects and had been told so, came up again better prepared in those points, but still kept ahead in the others. He believed that some two years ago it was an understood thing that there should be such an interchange of views as Mr. Bottle had referred to, and that deputations should go from one Board to the other. He hoped this plan would be carried out, and that opportunity would be taken of such meetings to discuss any alterations which were in contemplation, so that the two Boards might work unanimously.

The PRESIDENT said the resolution referred to was passed when the Vice-President was in the chair, and he himself was not aware of it until his attention was called to it by a letter from the chairman of the North British Branch. He had been in the habit of telling young men who had hopelessly failed those subjects in which they had been most conspicuously deficient, and he could not see that he had done wrong. But he could well understand that when a young man who went through all his subjects and failed, came next day to the office and wanted to know in what subjects he had so failed, it was not quite reasonable that the clerks in the office should have the books of the Examiners open before them and state what numbers the candidates had obtained in each subject. He did not wish any hard and fast line to be drawn, and he agreed that the resolution ought not to have been passed without communicating with the Scotch Board of Examiners.

Mr. SANDFORD thought this was a matter which should be remitted to the Board of Examiners. There were reasons given for this resolution at the time it was passed, and the Council should not prejudice the matter by discussion.

Mr. SCHACHT was exceedingly glad to hear of anything which would lead to the result of making the examinations in the two localities as nearly as possible identical. It was very desirable that every member of the Council should make himself familiar with the interior of the examination rooms, as it would tend to assist them in the future choice of examiners, and perhaps some gentlemen who might not feel quite satisfied as to the way in which the examinations were conducted might thus have their opinions modified, as he confessed his own had been.

The PRESIDENT said members of the Board of Examiners were always happy to see members of the Council.

Mr. ATKINS was glad this point had been mentioned. Hitherto he should have considered himself an intruder in the examination room.

The PRESIDENT said it would of course be impossible to have all the Council present at once; it was a matter of courtesy.

Mr. MACKAY said the Board in Scotland would be very glad to welcome any deputation of the Council which should accompany the deputation from the Board of Examiners when it visited Edinburgh in the course of the ensuing year.

THE PRELIMINARY EXAMINATION.

The PRESIDENT read the following letter from the Secretary of the Glasgow Chemists and Druggists' Association:—

"Glasgow, Nov. 30th, 1877.

"The President and Council
of the Pharmaceutical Society of Great Britain.

"Gentlemen.—At a meeting of Council of the 'Glasgow Chemists and Druggists' Association,' held on Wednesday, 21st instant, there came up for consideration 'the large percentage of failures in recent Preliminary examinations throughout the country,' remitted them by the Association, when it was unanimously resolved that your Council be approached on the subject.

"The Council have noticed with regret the very large percentage of failures, and naturally ask, why is it so? are the candidates at recent examinations inferior in education to candidates at former, or, are the questions in examination papers more difficult now than formerly?

"This Council think the reason will be found in the last-named cause; they also think that the questions are too severe as an entrance qualification to our trade, and that if such a standard be continued, great difficulty will be felt in securing apprentices. They therefore respectfully ask that your Council take into their consideration the Preliminary examinations, and that you instruct the framers of the examination papers as to the standard to be adopted by them.

"In name of the Council.

"We are, yours respectfully,

"DANIEL FRAZER, *President*,

"JOHN WALKER, *Secretary*."

The PRESIDENT said he need hardly remind the Council that the examination papers were set by the College of Preceptors, of course under general instructions from the Council or Board of Examiners. He thought the matter might be referred to the Board of Examiners.

The SECRETARY said he had prepared a table showing the percentage of failures from 1872 to the present time. In 1872 the percentage of failures was, in England, 38·019; in Scotland, 44·961. In 1873, England, 48·14; Scotland, 41·35. In 1874, England, 52·18; Scotland, 42·1. In 1875, England, 51·88; Scotland, 33·64. In 1876, when the examination papers were all set by the College of Preceptors, and all the answers came to that body, the percentage of failures was 42·4. In 1877 the percentage had been nearly 46.

Mr. ATKINS was surprised to find the position which Scotland held in this matter, from his general knowledge of the state of education in that part of the kingdom. He felt that the great cause of failure was that young men put off coming up for examination too late. The examination was intended to be preliminary to entering the business, and he was satisfied that many lads could pass the examinations on leaving school, when they might have a difficulty in doing so after three or four years. There was a case within his own experience of a young man who was really well informed, but who had failed once, and he feared he had failed in his second attempt very recently.

Mr. ATHERTON said the statistics prepared by the Secretary had answered the questions put by their Scotch friends. Having moved the resolution transferring the examinations from their own Board to the College of Preceptors, it was a matter of satisfaction to him to know that the percentage of failures had been on the whole less since this change was effected than before.

Mr. MACKAY agreed with Mr. Atkins's remarks, but he thought the cure lay rather with the masters than the young men. For some time past the leading pharmacists in Edinburgh had set their faces against binding any young man who had not passed the Preliminary examination. If all masters would follow the same rule they would very soon get rid of the objection.

Mr. GOSTLING was convinced that the Preliminary examination was not at all more severe than it ought to be. The questions were very few and simple, and he thought their friends in Scotland ought to be informed that the Preliminary examination was not in any degree too severe.

The PRESIDENT said the object of the Preliminary examination was to see whether a young man had received such an education in early life as would fit him to undergo his future examinations and to carry on the business afterwards. Perhaps their friends in Glasgow were taking their apprentices from a lower grade in society than had been the practice before.

Mr. CHURCHILL said he knew there was a feeling amongst some members of the trade, that it was more difficult to get apprentices than it used to be; he had no experience in the matter himself, but he knew the feeling existed, and he hoped the Council would consider the matter. It was a well known fact that at many schools where what was called a classical education was given English subjects were very greatly neglected, and he believed there were many who could really speak and write good English who would yet find a difficulty in answering questions on the technicalities of English grammar.

Mr. SCHACHT thought the question before them was very simple. A section of their body had memorialized the Council on the basis of certain supposed facts which on examination turned out to be imaginary, and he thought the simplest answer would be to place before those gentlemen the true state of the case.

The PRESIDENT agreeing with this suggestion, it was adopted accordingly.

ELECTIONS.

ASSOCIATES.

The following having passed their respective examinations, and having tendered or paid, as Apprentices or Students, their subscriptions for the current year, were elected Associates of the Society:—

Cowgill, Benjamin Rangdale ...Bingley.
Macdonald, Ewen..................Inverness.
Phillips, Evan ....St. Clears.

An Associate was restored to his former status in the Society on payment of a fine.

The following person was restored to the Register of Chemists and Druggists:—

George Pickrell, Burnham Westgate, Norfolk.

CHLORAL HYDRATE.

The SECRETARY read a letter received from the Privy Council, stating that the proposal of the Council to place chloral hydrate and its preparations in the schedule of poisons was still under consideration.

ST. THOMAS'S HOSPITAL.

The SECRETARY read a letter from Mr. Sydney Plowman, asking for the loan of some specimens from the museum for exhibition at the ensuing *soirée* of the St. Thomas's Hospital Physical Society, on the 13th inst.

The request was unanimously agreed to.

REPORTS OF COMMITTEES.

FINANCE.

The report of this Committee was read and adopted, and sundry payments ordered to be made. The report also included the recommendation to purchase £2000 stock New 3 per Cents. to the account of the General Fund.

Mr. SANDFORD proposed as an amendment, that £500 should be transferred to the Benevolent Fund.

Mr. BETTY thought such a proposal ought not to be entertained without notice having been given.

The PRESIDENT said it was important in his view that they should look to increasing the invested capital of the Society, because he hoped the day would some day come when the Society might be able to become its own landlord and have a permanent freehold home of its own.

Mr. BOTTLE asked Mr. Sandford to withdraw his resolution, because he did not think the Benevolent Fund would be really benefitted by such a grant, but would be rather damaged than otherwise. The Council was now distributing a large portion of the Benevolent Fund to those who did not contribute to the funds of the Society, or to the Benevolent Fund itself, and if the Council allowed these men to infer that their subscriptions were not wanted, it would much cramp the action of the Secretary in getting in those small subscriptions which he was so anxious to obtain. He also endorsed the argument put forward by the President for keeping the funds of the Society intact.

Mr. SANDFORD said he would for this day withdraw the motion, but would give notice of it for next month.

LAW AND PARLIAMENTARY.

The report of this Committee included the usual monthly report from the Society's Solicitor, giving particulars of the progress of those cases which had been placed in his hands, in one of which the person proceeded against had consented to the payment of a penalty and costs. Other cases were standing over for want of clear evidence.

The report was received and adopted.

The Council had under consideration, in committee, the question now pending between the Society of Apothecaries and chemists and druggists respecting counter practice, and after some discussion it was adjourned to a future meeting.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£15 to the widow of a registered chemist and druggist, who had been 18 years in business.

£15 to a registered chemist and druggist, aged 66, in feeble health and out of employment.

The Secretary had reported that there being no chance of securing the election of the child for which a grant was made at the last meeting into an orphan asylum, he had not expended any portion of the money.

The death of one of the annuitants was also announced. The Committee recommended that a portion of the balance in the Treasurer's hands be invested in the purchase of £104 14*s.* 9*d.* stock in Consols, making the total amount invested on the Benevolent Fund Account £17,800.

The report and recommendations were received and adopted.

LIBRARY, MUSEUM AND LABORATORY.

The report of this Committee was read.

Mr. SCHACHT said amongst the recommendations for the purchase of books, there were often seen that of new editions. He wished to ask what was done with the old ones.

The PRESIDENT said some of them were sent to Edinburgh.

Mr. SHAW asked if the list of museum duplicates had been published. They were re-arranging their museum in Liverpool, and would be glad to see this list.

The PRESIDENT said the list was not yet made; but the Leicester Society having sent up a list of what they wanted, the Committee thought it as well to send at once such specimens as the Society had in duplicate.

Mr. GREENISH said the list would be prepared as soon as possible, and when it was done the provincial societies would do well to send up their requirements promptly.

Mr. MACKAY remarked that a complete list of the duplicate specimens sent to Edinburgh had been prepared, and he believed would have been published in the Journal last week, but for a pressure of other matter.

The PRESIDENT added that new editions were purchased only of books for which there was a constant demand.

The report and recommendations were unanimously adopted.

NEW ASSOCIATION AT COVENTRY.

The PRESIDENT said he knew it would please the Council to hear that a new Chemists and Druggists' Association was in process of being formed at Coventry.

HOUSE.

The report of this Committee was read and adopted.

PHARMACEUTICAL MEETING.

Wednesday, December 5, 1877.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

The minutes of the previous meeting having been read and confirmed—

The CURATOR called attention to various specimens on the table. Among them was one of *Grindelia robusta*, which he said was coming into use in this country. It had been employed for some time in America as a remedy for asthma. It was first introduced in that country into notice as an antidote to the poison *Rhus Toxicodendron*, which in some persons caused an inflammation like that of erysipelas. It afterwards came into use in spasmodic asthma, in relieving which it seemed to have very much the same effect as lobelia. The small pot on the table was one of the original pots in which the curari poison was imported. The specimen of cinnabar came from a recently discovered mine in California, the New Almaiden mine, which was said to be very rich. The specimen of ndilo oil had been, he believed, prepared by pressure, and that Mr. Moss would be able to give its history.

Mr. MOSS said he believed that the sample of ndilo oil had been veritably prepared by the natives of Polynesia by pressure. It had some reference to an oil which the President showed at the last meeting of the Society, and which was obtained by benzole from the kernels of *Calophyllum inophyllum*. At the last meeting Mr. Holmes read an extract from Seemann's 'Flora Vitiensis,' to the effect that the oil was used by the natives of the South Sea Islands in cases of rheumatism, bruises, sprains, and so on, and was obtained by pressure. The sample now on the table had a green tint, whilst that shown by the President at the last meeting was brownish yellow. He (Mr. Moss) thought that the difference might possibly be due to chlorophyll extracted in the process of expression, but from Seemann's account it appeared that that idea could hardly be correct. However, perhaps Seemann's account was not the only one which might be given of the mode of getting the oil, for the colour was after all probably due to chlorophyll. If the oil was shaken up with a little strong rectified spirit the green colour was removed, and the liquid became the same colour as that shown by the president.

The PRESIDENT said that before proceeding to the proper business of the evening he ought to mention that they had amongst them a very old friend and member, and, in fact, a former practical instructor and student in the school of that society—Mr. C. H. Wood. That gentleman had just returned from India for a short holiday trip, and he was sure the Society would welcome him. Mr. Wood proposed to give them a paper at the next meeting, on the 6th February, on the "Progress of Cinchona and Alkaloid Production in Bengal." He need hardly remind them that Mr. Wood was the Government Quinologist in India, and therefore was the best authority they could have on a subject of that description.

The PRESIDENT said that before calling upon the authors of the six papers to be read that evening, he would invite the attention of the meeting to a circumstance which seemed to him to be of particular interest—namely, that they were all written by former students in the Society's School of Pharmacy.

A paper was then read on—

NITRITE OF ETHYL.

BY J. WILLIAMS, F.C.S.

During the reading of this paper, and the discussion which followed it, the chair was occupied by Mr. Sandford. The paper is printed at p. 441.

The CHAIRMAN (Mr. Sandford), in thanking the President for the paper on a subject so nearly allied to a question which had of late exercised the minds of so many of them, remarked that the latter part of the paper drew particular attention to the increasing use of the active principles of drugs, instead of the drugs themselves, and the necessity of having those active principles carefully prepared. That was a matter to which pharmacists ought to take great heed, and he felt very thankful that they had a President who would be so good a guide, always keeping himself abreast of the science of the day.

Mr. RIMMINGTON said that personally he thanked the President for having introduced this matter to the Society. In many respects the paper confirmed the conclusions which he had himself arrived at, and stated in the paper read at the last meeting, and he intended to make a further contribution on the subject. He also had found that strong alcohol was necessary for the production of a proper article. The object of his former papers was to show the necessity as well as the possibility of producing a very much better article than had been generally produced. Sweet spirit of nitre had acquired rather an ill name among the profession, as well as amongst the public, and if it was not to be driven out of pharmacy some improvement must be made in it.

Professor ATTFIELD said that it was gratifying to him that such an eminently practical paper should, to some extent, have arisen out of the remarks that he made at the last meeting. Those remarks were not made without good foundation. During the last four or five years they had made a large number of experiments in the laboratories of the School of Pharmacy on this question, both synthetically and analytically. They had failed to find any process which would enable them to assay a sample of sweet spirit of nitre accurately. In estimating the value of a sample they had consequently been driven to isolate the pure nitrite of ethyl. Many fractional distillations had to be made, the examination of one sample often involving a dozen or twenty of such processes. With reference to the impression upon Mr. Williams' mind that he (Professor Attfield) had disparaged the value of sweet spirit of nitre as a medicine, he could say that he did not intend to state anything of the sort, and he did not think that the record of his speech would warrant Mr. Williams in coming to that conclusion. However, he might say once for all, that he did not disparage the use of so ancient and excellent a medicine when properly prepared. At the same time it was well known that many medical men had considered that sweet spirit of nitre was altogether valueless. The reason was, doubtless, that some samples of the article sent into pharmacy for the use of medical practitioners had been little else than spirit of wine. A remedy so largely used with such obvious and often rapid results must have some good in it, but whether that good was due to nitrite of ethyl or to aldehyde, to alcohol or to other bodies, was open to question. He himself was under the impression that the active principle of sweet spirit of nitre was the nitrite of ethyl, and he was led to that conclusion mainly by the researches of Dr. Richardson, who had experimented largely upon the nitrites. He might refer to what Dr. Richardson had said about the nitrites of methyl, ethyl, butyl, and amyl. In a paper read before the British Association, Dr. Richardson, after speaking of nitrite of butyl, the third member of the series said—"We may, I think, consider that the physiological properties of the nitrites are, in an elementary sense at least, understood. They all present a beautiful unity of action, varied only in increasing force and persistency of action as the weight of each representative in the series increases with and from increase of carbon. The summary of their action is briefly as follows: they act instantaneously on the nervous system of organic life, reducing the power or force of that system, and reducing, as a result, the vascular tension; thus they cause relaxation of extreme vessels, and that suffusion of blood which is the most prominent visible sign of their effect; thus they cause intense action of the heart, followed by quickened respiration, due to the liberation of the heart from the tension to which it is normally subject; thus, administered internally, they cause (and this is specially the case with nitrite of ethyl or nitric ether) free secretion of organs, such as the kidneys, which are under the control of the organic nervous centres." But whatever opinion might be held as to nitrite of ethyl being the active principle in sweet spirit of nitre, Mr. Williams had given to therapeutists the means of using definite solutions of definite chemical substances, and he did hope that more than one therapeutist would be led to experiment with these substances. It was quite clear that nitrite of ethyl, for instance, was a most useful medicinal agent. Hitherto the medical profession had only had sweet spirit of nitre to look to for a solution of that agent; and as the proportion in which nitrite of ethyl occurred in sweet spirit of nitre was most variable, medical men might be pardoned for viewing that medicine with halting confidence. Let medicine plainly tell pharmacy whether she needed a solution of nitrite of ethyl, of aldehyd, of a mixture in definite proportions of those substances, or what not, and medicine would find pharmacy to be an able as well as willing handmaid equal to the occasion. As he understood Mr. Williams' process, it was mainly Liebig's process improved. His late assistant, Mr. Davies, had also prepared nitrite of ethyl in the laboratory by Liebig's process and rectified it. There was on the table a pure sample which had very much the character of the sample which Mr. Williams had brought before the meeting. As to the strength which Mr. Williams recommended, namely, 5 per cent., he (Professor Attfield) thought it was suitable. With reference to the present official process, he should say that the article prepared by it contained less than 5 per cent. If the whole of the nitric acid which was ordered there was converted into nitrite of ethyl, it would be impossible that it could yield more than 7 or 7½ per cent., and he knew that the whole of the nitric acid was not converted into nitrite of ethyl. In the laboratory they had succeeded in getting the official spirit to contain from 3 to 4 per cent., so that, probably, 5 per cent. might be regarded as a fair and full strength. As to the mode of testing the solution he believed that most persons employed such a tube as that which had been alluded to by Mr. Williams. The speaker was interested in knowing that chloride of calcium solution added to a spirituous solution of aldehyde did not cause any separation of the aldehyde. A recent experiment of his own seemed to show the same thing. At the same time, it would be readily understood by chemists that when a body like nitrite of ethyl was separated from its alcoholic solution containing aldehyde by a saturated solution of chloride of calcium it took the aldehyde with it, and that the liquid separated was a mixture of nitrite of ethyl and aldehyde, notwithstanding the fact that the chloride of calcium would not alone cause the separation of the aldehyde from the spirit. He believed that in this fact they had another instance of the phenomenon which might be called molecular adhesion, by which one body would take another body into or out of solution with it, although the body so taken into or out of solution would not be dissolved or separated if the other body were absent. He agreed with all that Mr. Williams had said respecting the importance of preparing definite substances in pharmacy for presentation to medical men or therapeutists. He should like to read two sentences which Dr. Richardson had uttered at the Exeter meeting of the British Association, as bearing on that part of the subject, and because they were of great general interest to pharmacists. Dr. Richardson had been referring to a report on the physiological action of the very substances of which they were now speaking, and he said, "The leading idea of the report is that which I brought forward at the Birmingham meeting—the idea of studying the action of substances which are to become remedies, not by the old and faulty method of so-called experience, but by proving physiological action and the relation of chemical constitution to physiological action. I am certain the time must soon come when the books we call 'Pharmacopœias' will be everywhere re-constructed on this basis of thought, and when the chemist and physician will become one and one." Respecting Mr. Williams' remarks on the parallelism of action of single active principles of drugs, and of infusions, decoctions, and extracts of those drugs, pharmacists and chemists had been told over and over again by therapeutists that they must not consider the action of the single active principle of the drugs and the action of the galenical preparations of those drugs as identical, but that they must consider that the action of the single so-called active principle of an infusion, or decoction, or extract, was either toned down, enhanced, possibly partially neutralized, or otherwise altered by the other substances which were present. One word more. He hoped that such a substance as pure nitrite of ethyl would not be demanded of pharmacists, for he thought that it was extremely undesirable that the public should have undiluted chemical principles of such great activity placed in their hands. Such substances were frequently very deadly poisons, and sometimes, as in the case of ethyl nitrite, physically dangerous.

Mr. R. H. Davies said he thought that Liebig's process which had been adopted in the laboratory was, perhaps, a little simpler, at any rate with regard to the apparatus employed, than that which Mr. Williams had used, although, doubtless, the latter would yield a purer product. He had used arsenic and nitric acid as being the best means of getting nitrous gas evolved, and he had used dilute alcohol instead of strong. The alcohol and water in which the nitrous gas was passed were immersed in a mixture in which ice was permitted to melt. By this process a large quantity of nitrite of ethyl had been collected on the water. This crude nitrite of ethyl mixed with alcohol had been mixed with a solution of bicarbonate of soda, and then decanted, or, rather, the heavier liquids had been allowed to run away by a separating funnel, and the purer nitrite of ethyl was distilled from the chloride of calcium. This had yielded a product of which five-sixths had distilled over under a temperature of 63·5 and as 62·5 was the boiling-point given by Schorlemmer, it would appear necessarily to be a very pure product. It was perfectly easy to mix that product with alcohol. He had made 5 or 10 per cent. solutions with great ease. The 10 per cent. solution had given 7 per cent. upon separation, instead of the 5 per cent. obtained by Mr. Williams. This might point to the former being a little less pure than Mr. Williams's. On one other point he differed from the results obtained by Mr. Williams. Mr. Williams had said that a solution of aldehyde mixed with a concentrated solution of chloride of calcium did not yield any separation. He (Mr. Davies) was inclined to think that it did. At any rate, a solution of pure aldehyde, so-called, produced by some celebrated manufacturers, yielded a separation when mixed with alcohol to form a 10 per cent. solution. He believed that about 5 per cent. separated. In the laboratory they had prepared nitrite of amyl very satisfactorily by the same method.

Mr. Umney said that, as a manufacturer of sweet spirit of nitre by the Pharmacopœia process, he felt bound to say that he had for years prepared, with the greatest ease, a concentrated solution of hyponitrous ether by the process there described. He had dealt with large quantities, having never less than four gallons of spirit in the still, and this generally produced eighty pounds of the official sweet spirit of nitre when completed. The process must not be carried on in the ordinary way, without extra attention, for sometimes the action was so violent that in the summer months he had seen the head of the still lifted off. He had been compelled to lay on cold water to the jacket of the steam still to moderate the action. With these precautions there was no difficulty in making a preparation which, when diluted as directed, would give 2 per cent. of that ethereal liquid by the chloride calcium test, whatever it might be. He was positive that it could be made of double or treble the strength, if necessary. There would be no difficulty in doing this if, instead of conducting the distillate into an open carboy, the adapter was connected with a piece of glass tube passing to the bottom of the vessel and dipping into alcohol. The nitrite of ethyl coming over in a gaseous form was then rapidly absorbed, and a solution was produced containing at least 20 per cent. of hyponitrous ether. He had for years prepared concentrated spirit of nitre in that way. He believed that the statement in the Pharmacopœia led to the inference that the separation of 2 per cent. would leave 8 per cent. absorbed by the chloride of calcium solution. As far as he could gather from Mr. Williams' paper, 5 per cent. was absorbed by the chloride of calcium, and not 8 per cent. If so, then the Pharmacopœia solution would be more accurately put down as containing 7 per cent.; but that the process could be carried on on the largest scale he himself could bear testimony from experience during the last five or six years.

Professor Redwood said that he should not have thought it necessary to make any remarks if it had not been for what had just been stated by Mr. Umney. He gathered from what Mr. Umney had said that he had found that the process could be very easily conducted, with some little modifications, but that it was liable to some danger without further precautions than were indicated in the Pharmacopœia, and that on some occasions the head of the still had been blown off and caused danger to the operator. He (Professor Redwood) wished to observe that he also had seen that process worked for many years in quantities quite as large as those mentioned by Mr. Umney, and in no instance in which the instructions of the Pharmacopœia had been obeyed had there been any approach to a violent action. In the cases he alluded to, certainly not less than four gallons of spirit had been operated upon at once, and the process had been carried on with a thermometer to indicate the temperature as directed by the Pharmacopœia, although that was hardly necessary, because the process went on with perfect regularity without any other precaution than that of taking care that there was the required heat, and no more, to get up that evolution of gas which caused a froth upon the surface of the liquid, amounting to a thickness of one or two inches. The spirit was distilled over, containing a large amount of ethereal liquid. It was true that in a former issue of the Pharmacopœia the liquid which separated was represented as nitrous ether, that term being used in a popular sense; but when the recent reprint came out he changed that term to the more correct term of "ethereal liquid." The amount of this ethereal liquid would usually be from 38 to 40 per cent., that is to say, such a quantity of the distillate would separate upon mixing the spirit with a concentrated solution of chloride of calcium. It was perfectly obvious that the ethereal liquid was not entirely nitrite of ethyl, and while the sweet spirit of nitre would contain about 10 per cent. of that liquid, it would contain probably about 5 per cent. of the nitrite of ethyl. A solution made in that way would, as Mr. Umney had admitted, cause a separation of about 2 per cent. when the spirit was mixed with the concentrated solution of chloride of calcium. He was anxious not to allow the subject to pass over without saying so much in vindication of the Pharmacopœia process, which he had always felt some little gratification in having been the means of introducing. He still felt that it was the only known process of producing sweet spirit of nitre of a tolerably definite composition.

Mr. Williams, in reply, said that his paper was not on sweet spirit of nitre, but upon nitrite of ethyl, and he did not wish to deal with the former body, but as Mr. Umney had introduced it he (Mr. Williams) trusted that his observations might not be misunderstood as applying to sweet spirit of nitre. He did not know what that compound was. He only wished to speak of a pure chemical of indicated and definite strength, and he had placed before the meeting a method of making that body in a definite way. Mr. Umney had made a remark as to the percentage of oily liquid yielded by the chloride of calcium test, but he (Mr. Williams) would remind him that the paper was speaking of absolute alcohol solutions, while Mr. Umney was not. In dealing with solutions of nitrite of ethyl in absolute alcohol, he (Mr. Williams) had a liquid when mixed with chloride of calcium which would dissolve a great deal more nitrite of ethyl than that which Mr. Umney used, and therefore the results could not be compared.* Something had been said about the boiling point. He (Mr. Williams) maintained that the boiling point of a liquid which would boil at 61° or 62° could not be taken as an indication of its purity at the temperature prevalent in this country. If they were living at the

* If in making this test of the strength of a solution of nitrite of ethyl in absolute alcohol the solution containing 50 per cent. be tested, it is evident that the 400 grain measures of solution of CaCl have united with 100 grain measures of alcohol, but if the test is applied to the 5 per cent. solution, the same quantity of chloride of calcium solution has united to 195 grain measures of alcohol. Consequently the latter solution has a much greater solvent power over the nitrite of ethyl than the first, in fact experiment shows that whereas the 50 per cent. solution only loses 2 grain measures of the nitrite, the 5 per cent. solution loses nearly the whole.

North Pole, where mercury was, normally, in a frozen state, then he should consider that a liquid boiling at something like 61° or 62° was a very tangible thing, and should be able to calculate its purity accordingly. But under existing circumstances the boiling point of 61° or 62° could not be taken as much evidence of purity. He would remind Mr. Davies that a pure aldehyde was not easily obtained. Aldehyde, as ordinarily met with, contained a certain quantity of acetic ether and acetone, and thus there was a separation; but if they had a pure aldehyde they would find that there would be no separation with chloride of calcium.

The President then resumed the chair.

A paper was read on the

Colour of Podophyllum Resin.

BY DR. A. SENIER, F.C.S., AND A. J. G. LOWE.

The paper is printed on p. 443, and gave rise to the following discussion:—

Mr. Martindale said that the explanation given in the paper was not entirely what he agreed with. It was a well-known fact that there were two resins easily separated from one another in the commercial podophyllum resin of the Pharmacopœia. Some years ago he tried experiments with regard to this substance, and he had two different samples. The resin which was soluble in ether was quite of a bright yellow colour; and the other, which was insoluble in ether, but soluble in spirit of wine, was of a pale stone-brown colour. With regard to the difference of colour, he believed that a great deal of it was due to the proportion in which the resins existed in the commercial resin, and when the yellow resin was present to a greater extent it gave a deeper tint than when it was present to a lesser extent. From notes which he made at the time of his experiments he found the commercial article was very variable. It was curious that the Pharmacopœia stated the resin of podophyllum was entirely soluble, or nearly so, in ether.

Professor Redwood: Not entirely.

Mr. Martindale thought that the part insoluble in ether, at any rate, accounted partly for the difference of colour, although the degree of comminution might account for some of the difference. The two resins which he had exhibited to-night were prepared by Mr. Morson, junior, eleven years ago. With regard to the action of the two there was very little difference, but the brown resin, which was insoluble in ether, had a quicker action than the yellow resin which was soluble in ether. The yellow resin had a much stronger odour than the brown resin, the latter having scarcely any smell. He had an idea that the brown resin was crystallizable, though he had not pursued his experiments far enough to be able to state this with certainty.

Professor Attfield said that he did not see that the observations of Mr. Martindale in any way conflicted with those of the authors of the paper. Might not Mr. Martindale's observations account for the slight differences in colour, as distinguished from shade, met with in commercial samples? That the state of comminution explained the differences of shade was, he thought, amply proved by the experiments of Dr. Senier and Mr. Lowe.

Mr. Martindale said that he had been speaking of the brightness of the yellow colour which was visible in some samples.

The President said that as Mr. Martindale's specimens were obtained eleven years ago, he thought that it was hardly fair to bring such specimens forward in contradiction to a paper which had just been written. They had advanced, and knew more about podophyllum since Mr. Martindale's experiments were made.

The next paper read was—

A Note on Rheum Officinale Grown in England.

BY HAROLD SENIER, F.C.S.

The paper is printed on p. 444, and gave rise to the following discussion:—

The President said that he noticed that the paper described the root as yielding only one-third the quantity of extract yielded by the East Indian root, and it stated that that extract, taken in ten grain doses, was about as active as that which the author obtained from other rhubarbs. Then he said that one was of equal medicinal value with the other. He (the President) supposed that the writer meant that it had only one-third the value.

Professor Attfield said that he was about to ask a somewhat similar question of Mr. Harold Senier, seeing that he had subjected himself to the action of this extract. By the way, it seemed to be getting quite the fashion amongst pharmacists to make such experiments on themselves, and thus do the work of therapeutists. They were getting quite famous for their martyrdom. He heard a conversation the other day between some medical friends as to the effect of some drug, and one gentleman said to another, "If you want to know its effect, send it to the Pharmaceutical Society, '*Fiat experimentum in vili corpore.*'" He was going to ask Mr. Harold Senier whether he really thought that the colour of the powder or of the infusion, or the amount of the extract or ash, really afforded any indication of the therapeutical value of the substance.

Mr. W. Hills said that Mr. Usher brought him about three years since a specimen of English grown rhubarb, he believed from the *Rheum officinale*. He made an extract with it according to the B. P. process, and compared the result with an extract similarly prepared from an East Indian rhubarb. He obtained 28 grains of extract from the former and 31 grains from the latter per 100 grains of root, and there was a marked difference in the physical characters of the extracts—the English being almost entirely devoid of the characteristic odour of extractum rhei, and of a much more sticky and mucilaginous nature.

The President said that he had no doubt they were not only very different in those qualities which had been mentioned, but totally different in their nature.

Mr. Harold Senier, in reply, said that his statement referred to the extract and not to the root. With respect to Professor Attfield's question, he could not say positively, but he thought that these differences afforded an indication of the value of the root; but that point, of course, could be only tested by the medical profession.

The next paper read was—

On False Angostura Bark and Brucia.

BY W. A. SHENSTONE, F.C.S.

The paper is printed on p. 445.

The President observed that this paper was one of a very important series, which was intended to clear up a subject which had been a mystery for fifty years. The present paper was a most important step in the matter. He wished that the author could show them more clearly how to purify brucia from strychnia. Still, the subject was progressing, and he had no doubt that the next paper would be in advance upon this.

A paper was then read, entitled—

Observations on Russian Turpentine Oil, and Oleum Foliorum Pini Sylvestris.

BY DR. TILDEN.

Mr. Postans also read a short communication on the same subject. These papers are printed on pp. 447 and 448.

The President had no doubt that the turpentine that had been described was very much more aromatic and pleasant in smell than the ordinary turpentine which was used in pharmacy. From its smell he should almost suppose that it had some terebene in it.

Mr. Moss asked whether he understood that this turpentine was the ordinary Russian oil of turpentine. He seemed to gather that idea from the paper which had been laid before the meeting, and he also understood that the variety was spoken of as new. He (Mr. Moss) did not know about Russian turpentine being new, but it had been quoted in the lists of the brokers for some time, and it had all the appearance of being a very old stager. It was indeed sold at a price of £2 or £3 a ton below American turpentine, and he should not be surprised if much of the turpentine now, or up to a late period, in commerce was Russian turpentine.

The PRESIDENT said that the smell of this purified turpentine would show that it was very different from the ordinary turpentine oil. It was much more like *oleum pini sylvestris*.

Mr. POSTANS said that he believed, from what Dr. Tilden had said, that it was comparatively new, notwithstanding the facts which Mr. Moss had stated. He believed that the advantages of the redistilled Russian oil were so great, compared with all other kinds of turpentine, and especially with regard to its fragrant odour, that when it was better known it could not fail to come into considerable use.

The meeting was then adjourned till February 6th.

NORTH BRITISH BRANCH.

The first meeting of the twenty-fourth session took place in the Society's rooms, 119A, George Street, Edinburgh, on Wednesday evening, 21st November. Mr. J. B. Stephenson, President of the Branch, in the chair.

The following opening address was delivered by Mr. Stephenson:—

"Gentlemen,—My first utterance from this chair must be the hearty acknowledgment of the great honour you have done me in placing me in it, and it would be mere affectation did I not add that I have accepted it with great diffidence. Especially do I feel this when I recall the honoured names of my predecessors in it—many of them, alas! no longer with us, and most of them standing to myself, and I believe to most of you, in the relation of fathers in the profession. I can only promise my best endeavours to advance the interests of our Society and to maintain the dignity of the chair, and I rely not so much on myself, as on your kind indulgence and forbearance, and on the well-known ability and willingness of our valued Secretary and his indefatigable assistant to keep me right.

"Gladly passing at once from things personal, I have to congratulate you on the continued prosperity of this, our North British Branch. During the past year our museum and library have been taken advantage of more largely than ever, which is certainly the very best evidence we could have of our prosperity.

"The Benevolent Fund of the Society had a benefit in the form of a dinner on its behalf last May. I am not sure that it proved quite such a success as its more sanguine friends had expected from the result of a similar appeal ten years ago. Still, it gave a great lift to the Fund. It is gratifying to find that this Fund advances year by year. We have now between twenty and thirty annuitants at £30 per annum which I see is to be raised in some cases to £35, and temporary relief, was given during last year to the amount of about £500. This shows a yearly revenue of about £1100. It is only when we take into account the large number of chemists in the country that these provisions appear insignificant and inadequate. Many other corporate bodies have widows' fund schemes on the principle of a mutual assurance company, but this involves a compulsory payment, and any such arrangement would be impossible in our present circumstances. Let us hope, however, that by and by when our Society becomes more consolidated, some such plan may be devised, and meantime, and indeed even in such a case as I have supposed, there will always be ample scope for benevolence; and allow me to suggest as a duty we all owe to the Fund, the making such provision as may tend to keep ourselves and our families from coming upon it. By so doing, you will mark that a poor man who can contribute perhaps little or nothing to the Fund, may still by the exercise of self-denial in insuring his life, become one of its most munificent benefactors.

"I wish I could congratulate you on the falling of the percentage of failures at our examinations. I have often felt quite depressed observing how high this percentage was. However, I must tell you that I have been making special inquiries, and I find that in more than one examining body in the city the rate is not at all unlike our own, and more than this I must mention that although my own limited experience as an examiner hardly warrants my speaking, I have the testimony of my colleagues that the style and class of candidates have improved very much within these few years, and we have Dr. Maclagan's emphatic opinion to the same effect in his last report as Privy Council Inspector. This is very gratifying and satisfactory, yet it is just what we might expect. We are yet only a very young society; our charter of incorporation dates 1843—just a generation ago—and up till 1868 we had no compulsory powers. Up till that year we were a voluntary association, and no doubt comprised all the best men, but since then we are only entering on our real mission, which is to raise the status of the whole body, and according to the evidence I have quoted we are already beginning to reap the fruit of the seed which has been diligently sown ever since our foundation. We are still quite a young society, and in an essentially transition state, but I have a firm faith in our *future*, and it is founded in great measure on our *past*, for who will say in looking back since 1843 that we have not accomplished much? We have now on our Register little short of 14,000 names—we have a school of pharmacy—in its organization and equipment, perfect—we have our examining boards in London and Edinburgh in constant operation and doing their work in a manner of which I leave Dr. Greenhow and Dr. Maclagan, who attend them on behalf of the Privy Council, to speak—we have scholarships and medals—we have on our roll of departed celebrities such names as Jacob Bell, Pereira, Fownes, Hanbury, and many more—names already household words. And let me point also to the speaking likenesses on our walls in this room of Mr. Brown and Mr. Tait, men who by their character and attainments would ennoble any association to which they belonged. Not the least hopeful promise of our future lies in the irresistible conviction that the memory and the example of such men are ours, and must be powerful in its influence on their successors. I have referred to our progress as a body, but in estimating it there is one thing specially that we should take into account. On the Continent they lay down a constitution on paper, and legislate on all the details at once, the qualification, the relation to the physician, the tariff of prices even, etc. In this country we can do no such thing. Look how long we were in getting any legislative sanction at all, and how grudgingly, and piecemeal as it were, it came. Our institutions *grow*, they are *not made*; they are the product of public opinion brought to bear on wants which must be long felt and agitated for till they are supplied. Thus it comes that our institutions are of slow growth, but then in the very process they acquire practicalness and stability. The essential condition of all our progress, indeed of our very existence as a body, is knowledge—in the most liberal sense. Our charter of incorporation in 1843 begins with the declaration that it is granted 'for the purpose of advancing chemistry and pharmacy, and promoting a uniform system of education of those who should practise the same,' and the Society has loyally acted up to this principle. Her agency extends to the general as well as to the technical education of her members. We have our Preliminary examination, which is in many respects the most important of them all, for on the educated character of the entrants to the profession depends the staple of the material of the whole body, and if the youth be not grounded in his general knowledge before entering on his pharmaceutical career he will be heavily handicapped in his future progress. While, however, I have no desire to minimize the stringency of this examination, I am bound to express my own personal opinion that the tendency lately has been to err in the opposite direction. Our agency for technical education has hitherto been confined to our school of pharmacy in London, but I think the time is rapidly approaching when it must be extended. Of course wherever there is a medical school there are opportunities for our students attending courses of lectures on materia medica, chemistry and botany, and in Edinburgh they have peculiarly advantageous means of doing so; but I believe the great majority of them get up their knowledge in scraps and patches, perhaps attending a course of lectures on a single subject when practicable, and eking out their knowledge by means of books, and perhaps that wonderful postal system that we hear of,—but altogether in a fragmentary and unsystematic manner. Now, except in very rare and exceptional cases, the acquiring of knowledge without a competent teacher or guide, is sure to be a wasteful and unsatisfactory process,—wasteful of time and energy, and productive of an inferior result. There can be no doubt of the perfection of our London school. It has done good work and will ever continue to do so. Even as a model and ideal of a school of pharmacy—something to go by, and aim at—it serves a valuable purpose. Let as many as can, take advantage of it, but these will ever be a limited class. Our great desideratum I think is a curriculum with special reference to pharmaceutical requirements, on the Bloomsbury Square plan, but shorn of its proportions, and established in various centres both in England and Scotland. Such schools would, I believe, be self-supporting, but at first I would have them under the auspices of the Society. The subject excited considerable interest some time ago, and gave rise to a good deal of discussion, and various communications appeared in the Journal, all showing that the want is being generally realized, and this being so, we may hope that the problem (for problem it assuredly is) is in course of being solved.

"Many years ago I heard Dr. George Wilson, of gentle memory, within a month of his lamented death, deliver a lecture on pharmaceutical education at one of our evening meetings. There were many memorable points in his address, but one especially I would reproduce. He told us in the outset that Pharmacy was not only an *art* but a *science*, or at least an art requiring a scientific knowledge for the proper prosecution of it; and in this connection I would like to quote a few sentences from the prospectus of the session in Bloomsbury Square by the Professors: 'Examination,' they say, 'even by the most highly skilled board with ample time at its disposal, and a wide area from which to select questions, is admitted by all authorities on education to be but a partial test of knowledge and an extremely imperfect test of education. Not alone the knowledge which can be tested by examination, but that which cannot be so gauged, should in all honour and in the highest self-interest be the knowledge ever assiduously sought. The one desire should be education, that is, knowledge accompanied by enlightenment of the understanding, mental training, mental discipline, and general elevation of the intellect.' I am glad to be able to quote two such competent authorities on the scientific character of Pharmacy, and it can hardly be superfluous to insist on it, when we have one of the leading medical journals some time ago, describing Dispensing as a nice, genteel, clean, and easy employment, essentially mechanical, and well adapted for females, and denouncing our whole tariff of charges as exorbitant, which could hardly be done if knowledge or responsibility, or even skilled labour, are to count as of any value at all. If there be an excellency in knowledge which ennobles, then is ours certainly not a mere trade to make money by, but a profession that we may well glory in belonging to. It must partake of the commercial character of other businesses, but I for one, repudiate the sordid idea that this is its main aspect, and that knowledge is to be sought only for the purpose of, as it were, floating us into it. Rather—the scientific is the main aspect, and I would urge you all, the young especially, to cherish this idea of it, and to let your aspirations and endeavours be ever towards realizing it. The result will be, as in cherishing a lofty principle and aim, to elevate the character, to ennoble the commonplaces of every-day life, and to brighten the inevitable anxieties and drudgeries of business. I have a practical end in view in this whole line of remark. I have no faith in the *science* which neglects the *art* of pharmacy. Let us never forget that for the successful prosecution of our business the same homely qualifications are indispensable as in any other business—moral integrity, devotion to business, diligence, punctuality, perseverance—and then, seeing we have a profession that ennobles us, let us take care that we adorn it, do nothing unworthy of it, take an intelligent interest in all that concerns it. There are our scientific meetings. We are certainly much indebted to our friends from without, who contribute to our edification, and to none more than to our friend Dr. Macadam, who is here again this session and is only waiting till I have done to begin. None of these friends will think that I speak in disparagement of their services when I complain that we should be so almost exclusively dependent on them. I know there are few amongst us who can give us an exhaustive scientific disquisition like my gifted predecessor in this chair, Mr. Gilmour; or who can lead us into the flowery fields of philosophy, like our friend Mr. Baildon, and there let us witness him measure swords (not unsuccessfully in my judgment) with Professor Tyndall himself; but are there any who could not, except from want of will, or excess of diffidence, give us some result of their observation and experience, some remarks which might provoke discussion and elicit similar results of experience, and so benefit the entire body? '*Verbum sat sapienti.*'

"The subject of counter prescribing has again come to the front in consequence of several cases of prosecutions of chemists by Medical Associations in England, and—as affecting our understanding with the medical profession, it is a most important and interesting one. Now, no one can deprecate more than myself anything like an encroachment on the medical man's province, or would be more willing to waive anything like an abstract right in the matter, yet I am bound to say, as the result of my experience, that I cannot see how we are to carry on our legitimate business as pharmacists in an intelligent and satisfactory manner, without constantly bringing into requisition in the service of the public our knowledge and experience; nor how any hard and fast line could be laid down, defining the boundaries of our respective provinces. Let me offer one or two considerations. First, as mere vendors of goods we ought to be able to recommend them, to speak of the advantages and disadvantages attending their use,—our education in our profession should have enabled us to do so much, as well as to give, when applied to, such remedies as a cough mixture, a gargle, a liniment, a dose of aperient or astringent medicine, and even to vary them according to circumstances. But further, we may be supposed to have some personal experience of ailments and their treatment, like everybody else. Why should we alone of all men be restricted from giving our neighbour the benefit of it; for I would never think of prescribing over the counter, except on the same footing that I would advise a friend or neighbour away and apart from my shop altogether? Only I would add as a rider to these, that an accomplished chemist ought to know at once, when the case is one for the physician and not for him, and to keep the public right in this matter also, and I believe that the man who is most competent for his other duties will be the most ready to perceive this one too. I wish, however, I could add that all chemists confine their prescribing to these lines. In England I constantly see dispensing and *prescribing* businesses for sale, and I believe that in Scotland also many of our brethren go to a quite unjustifiable extent in prescribing. No doubt it is largely practised as a retaliatory measure against doctors dispensing medicines, but however this be, we ought to have no hesitation in condemning it; it is not our business, nor have we any right to look for any remuneration from it; indeed I have long looked on this as the principle which ought to guide us in the whole matter, viz., that we should give our advice exclusively in the interests of the public, and make no profit by it either directly or indirectly.

"There is another subject allied to this, which I think fairly falls within the scope of these remarks—I mean the system of patent and proprietary medicines. You are all aware how large, how increasingly large, this department of our business becomes. I confess it is with a feeling of humiliation I observe how large a proportion of my business it is, and that I see the long list of articles of that description advertised in the daily prints. I am very far from grudging the reward either of fame or money to any one who, by his knowledge or skill, succeeds in introducing some new compound or preparation (and I could easily mention such cases), but I am sure it will be at once conceded that the great majority of the authors of these articles are not men distinguished for their attainments, either pharmaceutical or scientific. Their chief characteristic appears to me to be their universal habit of audacious and persistent assertion of the excellencies of their productions. Let me, by way of illustration, refer you to the class of preparations which are put forward under a fancy name, as curing sea-sickness and bilious headache, vitalizing the blood, and being eminently beneficial in cholera, typhus, yellow and other fevers. Now a very little consideration of the circumstances attending some instances where the composition of the article is known will lead to the conclusion that either the advertisers are ignorant of the nature of the hypothecally active ingredient, or they are not, in which case I leave you to draw the inference. *Ab uno disce omnes!* I think we should discountenance the whole system, as well from motives of loyalty to our profession as from self interest. Observe how it works. It is my business to compound medicines—to make my living by so doing—but when these gentlemen assume the compounding and delegate to me the selling, I must do so with a seller's instead of a dispenser's remuneration, and besides, I am degraded to the position of something like a huckster. It is difficult to indicate any practical course to take in the matter. It has been suggested that Government should withdraw what may be construed as their sanction in the requirement of the stamp, and no doubt the tendency of this is to give a certain official importance to the article, more especially when we see it stated that Her Majesty's Commissioners of Stamps have ordered the maker's name to be engraved on the stamp in white letters on a red ground or otherwise: yet this would meet only part of the case, for many of these articles are not subject to stamp duty, and besides, there can be no doubt that this whole class presents a very legitimate object for taxation. Of course I do not moot the question of our declining to deal in the articles: as the case stands, this would be quite impracticable or even suicidal; but short of this I think we can do much. Only let the conviction be wrought generally in our minds, that the system is an excrescence on our profession, and that it is likely if encouraged to drain the life blood from it; and that it is our duty—our mission, if you like—to educate the public on the matter, and I can imagine at least one practical outcome of it. We should take measures that the authors of the system did not get the advantage either of our names or of our profession to bolster up their productions. Our opinion goes for much with the public, and I believe is likely to become more and more powerful. We should let them know how we hold the whole system of quackery in contempt, that the articles are made like the razors of old *only to sell*, and that in using them they do so on the authority of the fabulous legends attached to them—not on ours. By so doing we shall win the respect not only of the medical profession, but also of the more intelligent of the public who will be able to appreciate our motives. But, better than either, we shall preserve our own self-respect, for it is quite certain to me that it is only in dispensing remedies, when we have an intelligent apprehension of their nature and properties and uses, that we can vindicate our claim to be an integral part of the old healing profession, whose glorious appellation we have adopted as our own motto, 'Opifer, or Help-bringer, over the Whole World.'"

Mr. Ainslie proposed and Mr. Mackay seconded a vote of thanks to Mr. Stephenson for his interesting address, which was most cordially responded to.

The Chairman then introduced to the meeting Dr. Stevenson Macadam, who expressed the pleasure he had in again appearing before the Pharmaceutical Society.

Dr. Macadam then read a paper "Paraffin Oils and their Action upon Metals." This lecture will be printed in the next number of this Journal.

At the conclusion of his lecture, the doctor was awarded a very hearty vote of thanks, proposed by the chairman and seconded by Mr. H. C. Baildon.

The Honorary Secretary announced the following donations and contributions:—

Museum.—A Musk Deer, from Mr. Robert Howden, London. Specimens of *Gymnina sylvestre; Polypodium quercifolium;* Strip Catechu; *Mimusops Elengi; Monarda punctata; Hygrophila spinosa; Cassia auriculata;* Opaque Bdellium; Bonduc Nuts; Boomah Nuts; Native Calamine; White Olibanum; Kaur Gum; Dead Bark; *Boerhavia diffusa; Eupatoria Ayapana;* Carnauba Root; *Ulmus fulva;* Seeds of the Poonwood tree; Safflower seeds; Bark of *Abutilon Indicum; Tiaridum Indicum;* Goa Ipecacuanha; *Aucklandia Costus; Eclepta erecta;* Japanese Isinglass, made from seaweed: from the Society in London.

Library.—'Pharmaceutical Journal,' 1st series, 1841-59, 18 vols.; 'American Journal of Pharmacy,' 8 vols.; Bloxam's 'Chemistry;' Faraday's 'Chemical Manipulations;' 'Throat Hospital Pharmacopœia;' Sutton's 'Volumetric Analysis;' 'Calendar of the Yorkshire College;' Mrs. Garrett Anderson's Inaugural Address, London School of Medicine for Women: from the Society in London. Hanbury's 'Pharmacographia' Hanbury's 'Science Papers:' from the British Pharmaceutical Conference, *per* the Hon. General Secretaries. A small collection of Autograph Prescriptions, from Mr. E. Coates, Edinburgh.

In proposing a vote of thanks to the donors, Mr. Mackay said that it should be a special one to Mr. Howden, for his kindness in sending such a rare and interesting contribution. This was carried unanimously. The Honorary Secretary then intimated that, through the kindness of Professor Archer, the next meeting would be held in the Museum of Science and Art.

Parliamentary and Law Proceedings.

Alleged Death of a Child from Opium.

An inquest was held on the 23rd November in the Devonport Guildhall by the Coroner, Mr. J. Vaughan, upon a child eight months old, who had been found dead in bed. The mother of the deceased said that the deceased was "teething," and that on the previous Wednesday evening about 8 o'clock she gave it part of a powder that she had obtained some two months previously, or more, from Mr. Codd, chemist, Duke Street, Devonport. This powder was not supplied to her by Mr. Codd for the deceased, but for another of her children who was much older than the deceased. She had on one occasion before administered half of a similar powder to the deceased, and at that time it appeared to do the child good. When she gave the deceased the powder it went to sleep, and continued in that sleep, without any movement that she observed, until about 1 o'clock in the night, when it was seized with a convulsive fit. It recovered from that, however, and again went to sleep. About 7 o'clock the next (Thursday) morning, the deceased had another convulsive fit. She gave the deceased only half the powder, because the deceased was very much younger than the child for whom she obtained the powder. The directions for use were printed on the label on the paper in which it was wrapped.

The paper was produced, and the Coroner stated that by the directions the whole powder might be given to any child between the ages of three and eight months old. The powders were called "Codd's teething and soothing powders."

Mr. F. Codd, chemist, said that after an experience and use of the powders extending over ten years he was perfectly satisfied that they were quite suitable for children of the ages mentioned on the directions, whatever might be their constitutions. Amongst other things the powders contained opium. When any one came to him for these powders, if they had never had any before, he always told them that they must not administer more than two a week.

Mr. Horton, surgeon, stated that he was first sent for at 8 o'clock, but was then in bed and when he reached the house before ten the child was dead; he ascertained that it had had slight colvulsions and that its mother had administered to it half of a powder which she had ob-from Mr. Codd. Under those circumstances he refused to give a certificate of death. Mr. Horton then proceeded to relate the result of the *post-mortem* examination of the body. He stated that the brain and its membranes were congested, and then described the internal appearance of the chest and abdomen. The right lung was congested very much; the left was unusually small, the lower part of it never having been inflated, thus proving that the child had never breathed properly from its birth; the liver was unusually large, and the child was of a delicate constitution. In his opinion the cause of death was attributable to the general disturbance of the system during the period of "teething," to the imperfect condition of the left lung and the other organs, and to the utter inability of the child to bear the dose of opium given. In answer to the Coroner, Mr. Horton replied, "My opinion is that if the child had not had that dose of opium, it would have been living now." The Coroner further asked Mr. Horton whether he would not consider a child having a very large liver, and having one part of its lung so defective that it had never been able to breathe through it, in a very precarious condition; and Mr. Horton said that he should not very willingly give a dose of opium of the strength of that administered to the deceased to a child five times as old. No medical man would ever give opium to a child in a similar condition to that in which the deceased was at the time this powder was administered. Children's constitutions were very susceptible to the effects of opium. There would be one-tenth of a grain of opium in the half powder administered to the deceased; he believed all chemists sold powders of the description of those sold by Mr. Codd. A juror inquired whether the opium would have occasioned the convulsions, and Mr. Horton replied that the occurrence of convulsions would be one of the most convincing symptoms for believing that opium had been administered. The Coroner inquired whether Mr. Horton, without having had a previous knowledge of opium having been administered, would from what he observed, when making the *post mortem* examination, have attributed death, bearing in mind the defects in the child's constitution, particularly to opium as he had done. Mr. Horton said the symptoms he saw would have caused him to suspect that opium had been administered, and hence he should have made inquiries, and in all porbibility arrived at the same conclusion as he had done.

Mr. Codd said he wished to explain how the powders were prepared, pointing out that it was impossible for the components parts not to be thoroughly mixed. The powders would act differently upon different constitutions.

The Coroner asked Mr. Codd whether he still adhered to his former statement relative to the administration of the powders and Mr. Codd said, "After hearing what Mr. Horton said, I shall endeavour to curtail, if not to stop the sale of them—or I shall diminish most certainly the quantity of opium they contain."

The Coroner: I think you would thus do well, because they are liable to get into the hands of persons who will give them to children whose constitutions are not suited to receive them.

Mr. Codd said: If I don't stop the sale of them I shall certainly diminish the opium, because of the effect it has, which I was not aware of before.

The Coroner, in summing up, pointed out that the deceased's constitution was such that it was clearly more dangerous to administer opium to him than it would be to children of healthy constitutions, and expressed the hope that the effect of the inquiry would be to cause chemists to be more careful in administering opium to children, which was clearly a dangerous thing to do except under the strictest medical supervision. He did not consider that any one could be said to be responsible for the deceased's death.

The jury ultimately returned a verdict of "Death from natural causes," and recommended generally that opium should not be given to children so young.—*From the Devonport Independent.*

Obituary.

Notice has been received of the death of the following:—

On the 11th of October, 1877, Mr. Henry Thomas Judd, Chemist and Druggist, Market Place, Warwick. Aged 48 years.

On the 18th of November, 1877, Mr. James Dresser, Chemist and Druggist, second son of Mr. Richard Dresser, Pharmaceutical Chemist, York. Aged 29 years.

On the 24th of November, 1877, Mr. Thomas Potts, Pharmaceutical Chemist, Grainger Street, Newcastle-on-Tyne. Aged 63 years. Mr. Potts had been a Member of the Pharmaceutical Society since 1853.

On the 2nd of December, 1877, Mr. John Sterriker, Pharmaceutical Chemist, Great Driffield, York. Aged 61 years. Mr. Sterriker had been a Member of the Pharmaceutical Society since 1852.

Erratum.—In the obituary notice of Mr. Hornsby, on p. 439, it should have been stated that deceased was late of Gateshead, and not of the London Hospital.

Correspondence.

F. Hollingsworth.—The book is published by Messrs. Groombridge.

C. Crook.—Probably iodide of bismuth is formed. You are recommended to analyse the precipitate.

Erratum.—On p. 422, col. i., line 21, *for* "fifteen" *read* "two."

A. K.—See vol. vii. of the present series, p. 850.

Carnifex.—A suitable quantity of any blue pigment ground fine in a mixture of 3 parts of balsam of copaiba and 1 part of hard soap.

Communications, Letters, etc., have been received from Dr. Symes, Mr. Williams, Mr. Davies, Mr. Rayner, Mr. Slipper, Mr. Proctor, Mr. Raynor, Mr. Macintosh, Mr. Stock, Mr. Barnes, Mr. Dixon, Mr. Tibbs, Mr. Lewis, Mr. Kimber, Mr. Rickaby, Mr. Linford, Mr. Lines, Mr. Hickisson, Mr. Laitram, Mr. Arblaster, Mr. Siebold, Experientia docet, Antipater, Hyacinth, Young Pharmacist, W. S., W. T., H. J. H., T. H. N., M. P. S., A. C. G., W. D. W., A. P, S., H. A.

PILLS AND PILL COATINGS.*

BY CHARLES SYMES, PH.D.

The pilular form of medicine is one which has received considerable attention at the hands of pharmacists, and so much has already been written and said concerning it that a difficulty presents itself to me in bringing the subject forward to offer much that is really original; I can however give some of the results of my experience, record and estimate certain known facts as they appear to me of more or less value, and thus submit my views of the matter which might not be uninteresting, inasmuch as we know by daily experience that just as the same ray of light falling on different bodies is either absorbed, transmitted, or reflected, and these in different degrees, so the same phenomenon impinging on different minds is differently received and produces a different impression, or, as we commonly say, is seen from different points of view.

The pill is a concentrated and portable form of medicine and often contains ingredients which would be exceedingly nauseous if taken in a liquid state; it requires no measuring out of dose and is thus exceedingly convenient; we cannot therefore be surprised that it has become very popular, and that the skill of the pharmacist has been taxed to its utmost to bring into this form a large variety of substances, to enhance its keeping qualities by every conceivable means, and to cover it in a manner which at once renders it both elegant and tasteless. The first operation in the production of pills is of course that of weighing out the ingredients. I mention this because I fear it is not always as carefully done as it might be; often the same balances are used to weigh one grain and one hundred Now as the knife edges will necessarily become somewhat blunted by these heavier weights, their delicacy wil become impaired and they will thus be rendered unsuitable for weighing small quantities of active substances. For these I prefer the German balances with graduated beam and sliding weight or rider, capable of weighing from one-tenth to five or ten grains *and not more;* then for larger quantities or less potent substances the ordinary dispensing balance weighing from a few grains to one hundred; and for anything above this quantity a small well made pair of counter scales should be used. These latter will of course only be required when the patient wants a large supply, or for the manufacture of stock pills.

Sometimes the ingredients of a formula will when mixed, themselves form a mass suitable for dividing into pills; but usually an excipient has to be added, and the proper selection of a suitable one constitutes the chief art in pill making. The list of excipients is somewhat lengthy in detail, but they may be summarized as follows:—Glycerine of tragacanth, glycerine, treacle, syrup, mucilage, tinctures, spirit, water, confections, extracts; powders of tragacanth, gum arabic, taraxacum root, bees'-wax, almond meal, soap, bread crumb, etc. Mr. Martindale has recommended a mixture of starch and glycerine, and Mr. Walter Searle a solution of soluble cream of tartar and citrate of potassa, to which is added syrup and mucilage. Whatever be the ingredients or the excipients, it should be borne in mind that to attain satisfactory results a pill must resemble a building and contain constituents possessing the physical characteristics of both bricks and mortar; these too, if possible, in such proportions as to produce a substantial structure.

Of the soft or plastic excipients in the foregoing list, glycerine of tragacanth is probably the most generally useful, as by means of it in small quantity we are enabled to get sufficient adhesiveness to bring solid particles, themselves devoid of that property, into a compact mass, and cause them to cohere firmly together without imparting undue hardness or insolubility. Metallic oxides and salts are by it rendered most tractable and a pill which would otherwise be very large is by it rendered quite within the average size. I produce samples of pills containing five grains bromide of potassium, and ten grains of subnitrate of bismuth respectively, neither of which are larger then a five grain colocynth pill. Glycerine itself, except in very small quantity, is not a good excipient though frequently prescribed; pills containing it are liable to absorb moisture and become sticky; they also do not take silver well when required so to do. Pills prepared with mucilage are liable to become very hard when kept for any length of time; with spirit they require to be rolled off quickly or will become brittle and crumble on the machine. Spirit should never be used when there is much resin in the pill, indeed with this, as with the other liquid excipients named, most pharmacists will have ascertained the special cases to which they are best adapted as the result of experience. Of the extracts that of liquorice is about the most useful, as it possesses no active medicinal properties; confection of roses and that of hips usually tend to increase the bulk of the mass rather more than is desirable, otherwise they possess good combining properties. It not unfrequently happens that the ingredients of a prescription, instead of requiring moisture, have in themselves too little solidity to form or retain the pilular consistence; we have as it were all mortar and no bricks wherewith to build. In such cases Mr. Proctor strongly recommends the addition of powdered wood; he compares a pill to an animal, and says this substance is real bone to it, which, doubtless is the case; but in the face of the satire on the apothecary and his sawdust pills, I have never been able to reconcile my mind to its use.

If the mass require but a small addition in the way of solidity and some elasticity, then a little powdered tragracanth answers admirably, but if the quantity be too great then the elasticity is also excessive and it becomes somewhat difficult to round off the angles under the pill finisher. If the mass is much too soft, and consists chiefly of moist extracts, the first thing to be done is to dispel some of the moisture by the judicious application of heat (for this purpose a very small hot-water plate is an acquisition to the dispensing counter), a little of some powder, such as tragacanth, gum arabic, liquorice root, or taraxacum might then be worked in and the mass be rolled out quickly before it has thoroughly cooled. If the extract possess a hygroscopic nature, such as that of dandelion, then tragacanth, which tends to dryness, answers well. But what I believe to be still better in the case of extracts which are not injured by drying is to use them in powder.

Pills containing much essential oil are best manipulated by the addition of a few shreds of

* Read before the Liverpool Chemists' Association, November 22, 1877.

wax and a little powdered soap where not incompatible; this combination enables the operator to get in more oil, carbolic acid, creasote, etc., in a satisfactory manner than any other means I am acquainted with. Almond meal has also been recommended for causing oily and watery substances to unite; it does so by its emulsifying properties and would be very valuable but, unfortunately, it gives an insoluble character to the pill and thus impairs its activity. An excipient formerly much prescribed, but about the worst I know of, is crumb of bread.

Some substances require special excipients. I will only mention two of these—sulphate of quinine might be made into pills with confection of hips; better, because smaller, with glycerine of tragacanth; but, best and smallest with tartaric acid (about two grains to twenty) and a single drop of water. Camphor and extract of henbane usually form a very refractory mass, breaking and crumbling on the machine; if, however, the camphor is powdered by the addition of a little *water* instead of *spirit*, all difficulty disappears, the mass retains its plastic condition for some time, and might be rolled out with perfect ease.

Whatever means are used for the formation of pills, they should when finished be perfectly spherical and present a smooth, firm surface; this is essential, not only for the sake of appearance, but for the proper performance of the second operation, viz., that of coating them.

Reading a short extract from the 'United States Dispensatory,' of 1833, will prove that even America, which has gone ahead so rapidly in pill coating as in most other things, contemplated nothing of the kind in those days. The method of covering pills with powders as there described was that which obtained in this country during my early initiation into the art and science of pharmacy some twenty years or more ago; indeed it is still practised in many, if not most pharmacies in the present day, a little of the powder also being placed in the box to keep the pills at a respectful distance from each other. The first improvement on this with which I became acquainted was that adopted by myself in 1860; possibly the same or similar methods might have been in use at the same time by others, but as far as myself was concerned it was original (at least as original as ideas ever are), and very simple too. It consisted in utilizing a waste product, viz., the resin left after preparing syrup of tolu; this, dissolved in ether, preferably with a sp. gr. of ·717 or ·720, formed a varnish in which the pills were rolled and whilst still moist were transferred to a box containing finely powdered french chalk, then turned on to a warm pill tray and kept rotating for a short time; finally they were polished *with slight* pressure under the pill finisher. Pills so prepared possess a steel grey appearance and smooth surface, though not the egg-shell white character now given them; but this method of procedure or some modification of it is the first part of the process adopted for accomplishing the latter.

The pills are now placed in a covered pot as at first, and are moistened with syrup, mucilage, or a mixture of the two; when evenly covered they are transferred to a box containing french chalk, or a mixture of it and finely powdered sugar, well shaken and again transferred to a warm pill tray, kept rapidly rotating until dry and smooth; the operation taking but a comparatively short time. Well covered in this way they will keep good for years. I have a specimen of some pills thus coated more than four years since; on cutting them open they will be found less hard than they would have become in as many weeks if left exposed as these have been and uncoated.

There is a drawback to this covering in the case of pills containing essential oils; the oil dissolves some of the colouring matter of the pill, and takes it through the coating which then becomes yellow or brown and unsightly. Manufacturers of these pills on the large scale usually get over this difficulty by substituting gingerine for any essential oil in the formula, but such a procedure is inadmissible in dispensing.

Under these circumstances the covering recommended by M. Calloud (*Journal de Pharmacie*, xxiii, 310) might be used with advantage; it consists of a powder prepared as follows:—

One part of powdered tragacanth mixed with two of water is pressed through muslin; this is then mixed with twenty parts powdered sugar of milk and spread on a porcelain slab in a thin layer to dry; lastly, it is reduced to a fine powder. This is not easily accomplished, but I have found by experience that the excellence of this coating largely depends on the fineness of the powder. The pills are merely moistened with water and rolled in the powder, keeping up a rotary motion till dry, and repeating the operation if necessary.

Pills of this kind also do well with gelatine coating, one of the oldest methods, and one which is now seldom used in this country, but the Americans still adopt it to some extent, and one house in New York advertises somewhat extensively a full line of gelatine-coated pills. The process is exceedingly simple, but like all others requires some amount of practice and dexterity for its successful accomplishment. The only necessary apparatus consists of a pin board, *i. e.*, a piece of wood into which pins have been pressed, so as to allow the points to project a good distance above the surface, and a small vessel of melted gelatine. I generally use the French sheet gelatine,—say four parts, water sixteen, glycerine one. The points of the pins should be slightly greased before placing the pills on them, and any scum or skin should be removed from the solution before dipping them; when removed a rotary motion with occasional inversion is kept up till the gelatine has set, they are then put aside to dry. In the *Pharmacist* (March, 1877) Mr. Charles B. Allaire describes an ingenious little apparatus, which can be readily constructed for coating pills with gelatine. A second piece of wood, the same size as the pin board, is so hollowed out in small hemispherical depressions as that one pill in each hollow corresponds with each pin in the pin board; this is for the convenience of picking up a quantity at once. When dry the whole are removed at once by a kind of comb with long teeth made to slide between the pins.

According to the tabulated results of a number of experiments by Mr. J. P. Remington (*Amer. Journ. Pharm.*) gelatine coating is not readily soluble, but the solvent used was only water, and even so could not apply to the coating containing glycerine. By a similar means Hawker's patent jujubes are covered, and I have never heard a customer complain of any difficulty in removing the coating; it appears to be readily soluble in the mouth.

Mr. E. K. Durden proposes (in the journal just quoted) to cover pills with collodion having a sp. gr. ·810; two dippings in this are said to give an elegant appearance; it is readily put on and completely conceals the taste of the medicine. Valerianate of zinc pills so coated,—which is about as severe a test as we can apply,—stand it moderately well. It remains, however, to be proved how far this coating is soluble in the stomach.

We now come to sugar coating. This process is conducted by manufacturers, especially in America, on an extensive scale, and seems daily to be gaining favour from the profession, the pharmacist, and the public. It possesses the advantages of a pleasant taste and ready solubility, and whilst there might be some doubt on the part of the patient as to the prudence of frequently swallowing pearl coating there certainly could be none on the part of the most fastidious as to taking a small quantity of sugar. This coating varies somewhat, however, and the purest sugar is not always used to produce the whitest coating; still it might be done without any admixture.

Numerous inquiries have been made of late as to the exact process to be adopted for satisfactorily accomplishing this object, the usual reply being, "Follow the practice of the confectioner in the production of his comfits," about which I may add there is but one secret. The process is simply this: pills well dried on the surface are introduced into a tinned copper bowl with a flat bottom, or enamelled iron dish, the surface of which has been moistened with syrup or with syrup and gum, they are then rotated and gently heated, very finely powdered sugar is dusted on, and the motion kept up until a perfectly dry, hard, and whitish coating is obtained, the operation being repeated till the desired result is accomplished—which with the pharmacist in his first attempt *is usually not the case.*

But now for the secret. We have followed the method of the confectioner in its outline; but what about his skill and experience? These are just the things wanting; the confectioner would be a very clumsy hand at producing the pill, the pharmacist is usually equally so at sugar-coating it; the confectioner could be educated to make the pill and the pharmacist to coat it with sugar if he would only apply his ability, gain experience by perseverance, and keep up by practice his acquired knowledge. A gentleman writing to the *Pharmaceutical Journal* a short time since, complained of what he considered to be want of courtesy on the part of certain Americans respecting a little apparatus for sugar-coating small quantities of pills. The truth is, I believe, that the said apparatus is to be found in every pharmacy; it is simply the knowledge of how to use it that is not.*

Lastly, we have silvering as an elegant coating readily applied. It is mentioned in the old 'United States Dispensatory' as a thing of the past, but is frequently used in the present day. I need say little or nothing about its application. Avoid the use of glycerine as an excipient in the pill, put as little moisture on the surface as will enable the silver to adhere, and burnish by rotating in a covered pot containing a little cotton wool to remove any loosely attached fragments of silver leaf.

* In the *Amer. Journ. Pharm.*, May, 1867, there is an article by Mr. H. C. Archibald, on "Sugar Coating Pills."

PARAFFIN OILS AND THEIR ACTION UPON METALS.*

BY DR. STEVENSON MACADAM, F.R.S.E.

During a lengthened series of experimental observations on different paraffin oils it was found that certain oils burned somewhat imperfectly in different lamps, and an examination of these oils led to the discovery that they were contaminated so largely with lead compound, as to lead to the choking up of the wicks, and ultimately to the lessening and practical extinguishment of the light. In the case of one of the oils the wick of the lamp had to be changed several times during a single night and the examination of these wicks proved that they contained so much lead compound as to leave, when charred, a fine net work of metallic lead. The oil in question had been stored in a cistern or tank lined with sheet lead, and notwithstanding the absence of affinity between paraffin oil and other substances, as indeed its own name indicates, the oil had apparently acted upon the metal and held the lead in solution.

In order to determine how far paraffin oil could act upon lead, a series of experiments was instituted in which oils of various qualities, originally free from lead, were allowed to remain in contact with the metal for different periods of time. These experiments proved that all the samples of paraffin oil which were experimented upon had more or less action upon metallic lead; that mere contact of the oil with the lead was sufficient to communicate traces of lead to the oil, and that in a week's time the oil invariably became so highly charged with lead that it was rendered unsuitable for combustion in ordinary lamps, owing to the encrusting of the wicks, and the consequent lowering of the luminosity of the flame. In order to render the experimental observations more complete similar trials with paraffin oil and other metals were carried on, and to enable the various experiments to be compared with each other the same quality of oil was employed in the principal investigations with the different metals.

Twelve series of experiments were made with the highest quality of burning oil and the metals—lead was employed in three of the trials because this metal is more liable to be acted upon when the surface is bright than when the surface possesses the ordinary skin or coating of oxide and carbonate, and the results obtained with bright lead might not apply to tarnished lead. This difference in action is well known in the case of the chemical influence of different natural waters upon lead.

1. *Bright Lead.*—When paraffin oil is brought in contact with scraped lead where the surface is quite bright, the chemical action begins instantly, and a few moments are alone required to communicate the metal to the oil. In a day the action is so decided that the oil begins to present rather a cloudy appearance, owing to the presence of the lead compound, and on washing the oil with water the latter on settling retains a milky appearance from the lead compound, which is apparently a basic salt, and has an alkaline action on test papers.

2. *Tarnished lead with unprotected edges.*—Lead cut into small sheets and placed in the paraffin oil without any protection to the fresh cut edges necessarily exposes a large surface of tarnished metal with the natural skin of oxycarbonate, and a comparatively small surface of bright metal, where the fresh cut edges are visible. The investigation showed that under these circumstances, the lead is not so readily acted upon by the oil, but in a couple of days the oil gets impregnated with lead compound and becomes unsuitable for illuminating purposes.

3. *Tarnished lead with protected edges.*—In this case the lead was taken with its natural skin and the fresh cut edges were protected by wax. Under those circum-

* Read at an Evening Meeting of the North British Branch, November 21, 1877.

stances, the paraffin oil acts even less energetically, and though traces of the metal may be found in the oil in an hour from the commencement of the experiment, yet it takes about a week before the oil becomes largely impregnated with the metal.

4. *Tin.*—This metal is very slightly acted upon by the oil, and in a month's time the amount of metal dissolved in and diffused through the oil is very small, and is not sufficient to impede the combustion of the oil in lamps.

5. *Copper.*—A very slight action is apparent after a month's exposure, and practically the oil is not affected thereby as a luminant.

6. *Iron* is slightly affected by the paraffin oil, and on ten day's contact the oil becomes deeper in colour and throws down a fine ferruginous sediment. The oil itself is, however, not materially injured as an illuminating agent.

7. *Zinc.*—This metal is sensibly acted upon by the paraffin oil, and the latter retains the zinc compound in solution and suspension. The oil is decidedly injured as a luminant.

8. *Tin solder* of the best quality, containing two parts of tin and one part of lead, is acted upon by the paraffin oil, and the latter is injuriously affected as an illuminating agent.

9. *Tin soldered with tin solder* is also acted upon, and lead is dissolved out from the solder by the paraffin oil. The quantity of metal dissolved out is not large, but is sufficient to influence the oil as a luminant.

10. *Tinned copper* is not practically affected by the paraffin oil so far as the combustion of the oil is concerned, but traces of both the tin and the copper are found in the oil after a month's exposure.

11. *Tinned iron* is acted upon very slightly, but the oil does not suffer as an illuminating agent.

12. *Galvanized iron* is readily acted upon by the oil, and the quality of the oil for burning with wicks is sensibly injured.

These experimental observations demonstrate that the metals lead and zinc should not be employed in the construction of or in the lining of cisterns or other vessels intended for the storage or reception of paraffin oils; that the metals, tin, copper and iron, as well as tinned copper and tinned iron, may be safely employed in the fabrication of the cisterns or other vessels, and that ordinary tin solder, containing lead, should not be used in the soldering of such cisterns or vessels. Galvanized iron should likewise be avoided. Whilst stating that the cisterns or vessels for the retention of paraffin oil may be safely constructed of or be lined with tin, copper or iron, it would be preferable to use cisterns or vessels lined with enamel in the interior, provided such could be obtained of sufficient size for the purpose. The ordinary enamelled iron pots present absolutely no surface upon which the paraffin oil can act, and cisterns or vessels constructed in a similar way with an interior lining of enamel would retain the paraffin oil for any time without affecting in the slightest degree the purity of the oil or its entire suitability for illuminating purposes.

In cases where lead cisterns or vessels have been in use for the retention of the paraffin oil there can be no doubt that the inferior illuminating power of the oil may be fairly attributed to the lead impregnation. The action is lessened much by washing over the surface of the lead with dilute sulphuric acid which forms a coating of the insoluble sulphate of lead, in or through which the paraffin oil has comparatively a feeble action. The oil, however, does take up a little lead and hence the impurity still continues to pass to the wick. A better protective coating is obtained by brushing over the surface of the lead with solution of sulphuretted hydrogen, and still better with sulphide of ammonium, when a coating of insoluble sulphide of lead is formed, on or through which the paraffin oil has still less action than on or through the sulphate of lead. The impregnation of the oil, however, still goes on, though in a minimum degree.

The paraffin oil employed in the principal trials was of excellent quality and was free from acid or alkali. The action, therefore, of the oil upon the metals was not due to the presence of any impurity in the oil. In other experiments made with different samples of paraffin oils upon the metal lead, it was found that the power of action differed materially in the various oils, but such difference in degree of action was not traceable to impurities in the oils. It is probable, however, that the various proportions of the hydrocarbons present may have an influence in aiding or arresting the action of the oil upon the metal.

TEST FOR SANTONIN.*

BY DAVID LINDO.

Place the santonin in a small deep porcelain dish, and dissolve it (without heat) in concentrated sulphuric acid. Rubbing the crystals down with a glass rod greatly facilitates solution. Add highly dilute solution of perchloride in small quantities at a time, and between each addition give the dish a pretty quick rotatory motion while it is supported on a table. A fine red colour is first developed, which changes to a magnificent purple, and then to a splendid violet as the sulphuric acid becomes more dilute. The heat produced by mixing the fluids is necessary to develop the colours.

When applying the test to small quantities of santonin a somewhat different method of proceeding must be adopted. The experiment in this case is best performed in a 1-inch shallow porcelain capsule, with a thick flat bottom. Mix the highly dilute solution of perchloride of iron with an equal bulk of concentrated sulphuric acid, and add the mixture to the santonin. Heat must then be cautiously applied. The crystals of santonin will slowly dissolve, and the colour will be developed.

The capsule is conveniently supported on the blade of a spatula, and heated by a spirit lamp.

One drop of a solution of 1 grain of santonin in 1 fluid ounce of chloroform was evaporated to dryness in a small capsule, and the residue heated with a drop of the perchloride of iron and sulphuric acid mixture. A very fine reaction was obtained.

The separation of santonin, however, from other organic matters would in most cases be a very difficult—and in many instances an impossible—thing to accomplish, owing to the facility with which it suffers decomposition.

In trying the experiment of separating santonin, by means of chloroform, from a powder containing rhubarb and santonin, I noticed a thing which I have not seen mentioned before. The chloroform separated from the powder by filtration was evaporated to dryness, and the residue tested for santonin. The violet colour was obtained very distinctly. I then tried the effect of the test-fluid on the colouring-matter of rhubarb alone, as I noticed this is disolved by chloroform. The test produced a reddish colour, not the violet or purple colour of santonin.

Thinking that in the case of rhubarb the iron had nothing to do with the reaction, I next tried the effect of *concentrated sulphuric acid alone* on the colouring-matter of rhubarb. I found it produced a beautiful scarlet colour: this is much the same effect (as is very well known) produced by alkalies on the colouring-matter; and when the latter has been turned red by an alkali an acid restores it to yellow.

Falmouth, Jamaica.

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* From the *Chemical News*, Nov. 16, 1877.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 15, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal· MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE MEANING OF SYMBOLS USED IN PRESCRIPTIONS.

THE plan of setting apart a special section of the Journal to the discussion of questions connected with dispensing appears to have been an appropriate and welcome means of intercommunication, if we may judge from the number of queries sent in, and from the number of prominent pharmacists who have come forward to render information and express their opinions. If no other result had been attained than that of deciding the question raised by the memorandum No. 21, which appeared last August, there would still be much ground for satisfaction, and we hope that it is not the only instance in which service has been rendered by the column for Dispensing Memoranda.

The question we refer to, concerning the propriety of interpreting the ounce symbol ℥ as indicating apothecaries' weight or the avoirdupois weight, is one in reference to which it appears, from the correspondence that has been published, a much greater difference of opinion prevailed than might have been expected. The first two answers to the query were diametrically opposite, and in commenting upon the subject in the October monthly article we seconded the view expressed by Mr. E. SAMSON, that the symbol ℥ is simply a mode of representing the old apothecaries' ounce of 480 grains, just in the same way that the symbol ʒ represents the eight part of that weight, or the drachm.

This opinion was speedily called in question by Dr. SYMES, under the impression that some ten years since the matter had been finally settled in the opposite direction; and his argument in favour of the ℥ symbol being understood to signify the avoirdupois ounce is based upon the fact that there is no specific mention of this sign in the preface to the British Pharmacopœia, where it is stated that physicians are to have the option of using the symbols ʒ and ℈ as representing sixty and twenty grains. But why that omission of the sign ℥ in the reference to apothecaries' weight should place its use in any more ineligible position than the use of the correlative symbols ʒ and ℈, or why it should attach to the ℥ symbol a significance which it never possessed, we have all along failed to comprehend, and from that point of view we still regard Dr. SYMES' argument as fallacious.

Our Glasgow correspondent, though conspicuously positive, was in our judgment not less entirely in error, and he also confuses the symbol of the troy pound with that properly belonging to the avoirdupois pound, which resembles it but is without the bar across the lb. His inference from the recommendation to avoid the use of the terms ounce and pound in reference to any other than the avoirdupois ounce and pound is not justified when he says that if a physician writes ℥j, meaning 480 grains, he has no business to do so, for this is merely begging the question, and his statement involves the assumption that the symbol ℥ represents the avoirdupois ounce. If he had said that the term ounce used to indicate 480 grains was improper he would have been so far right and in accordance with the British Pharmacopœia.

It is, however, unnecessary to follow out in further detail the arguments of the several writers on this subject, since we are enabled, through the kindness of Professor REDWOOD, to place before our readers a minute exposition of the facts to be taken into consideration in dealing with this question. In the letter which Professor REDWOOD has written (see p. 477), he gives in the first place a historical *résumé* of the legal position of the question, showing that out of four systems of weights and measures which have been legalized, two, viz., the troy and avoirdupois, are accurately defined on scientific principles, while the other two are made up of integers taken from them, and in one case having intermediate integers introduced for the purpose of making the system more suitable for use in prescribing and dispensing medicine, this constituting the apothecaries' weight in which the pound, ounce, and grain of the troy system are supplemented with the drachm and scruple; the ounce like its subdivisions being represented by the symbol ℥, while the avoirdupois ounce, as ordered to be used in medicine, is represented by the symbol oz.

The authority with which Professor REDWOOD writes upon this subject, as the editor of the British Pharmacopœia, is further strengthened by the concurrence of one of the members of the Pharmacopœia Committee, whom he has consulted, with the result that he entirely approves of the views expressed by Professor REDWOOD. We may, therefore, regard this question as being practically and definitively settled, and we recommend our readers to the careful consideration of the letter which appears under the head of Dispensing Memoranda in this number of the Journal.

Before concluding, however, it may be well to point out that the misconception under which some of our correspondents have laboured seems to have arisen in great measure from an impression that the apothecaries' weight is obsolete. That, indeed, seems to be the only real foundation for the opinion that the avoirdupois ounce should be understood as being indicated by the use of the symbol ℥. In regard to this point, however, it is explained by Professor Redwood that the intention of introducing avoirdupois weights into the British Pharmacopœia, and recommending their use by medical men, was to facilitate the ultimate substitution of these weights for the old apothecaries' weights. It was not reasonable to expect that this change could be effected suddenly and it is for this reason that the recommendation to use avoirdupois weights was accompanied by the sanction to use the symbols ʒ and ℈ in place of writing gr. 60 or gr. 20 in their prescriptions. This sanction, however, does not furnish any justification for confounding the weights of the avoirdupois system with the apothecaries' weights.

THE UNITED STATES PHARMACOPŒIA COMMITTEE.

The proceedings of this Committee, to whose first report reference was recently made in these columns, appears to be attracting considerable attention amongst United States pharmacists. The suggestion that has raised most discussion is the one to abandon all measures of capacity and to express quantities only in parts by weight. Professor Diehl points out that though this may be comparatively easy with the majority of preparations, yet, in dealing with one important class—the liquid extracts—it will be a problem involving much thought and labour to solve. One difficulty raised by this gentleman is not very complimentary, though probably it cannot safely be ignored in the United States any more than it could be in this country. Professor Diehl asks, evidently doubtingly, whether, in the event of the change being made, the average American pharmacist could be entrusted with the production of preparations the eventual strength of which would be so dependent upon the careful determination of the specific gravities of the menstrua employed and judgment as to the complete exhaustion of the drug. He manifests an evident fear that the supposed simplification may result in throwing the production of certain galenical preparations into the hands of manufacturers more than it is at present.

It is also noteworthy that there are signs that the use of glycerine as a menstruum, which constituted such an important feature in the last edition of the United States Pharmacopœia, is now looked upon in some quarters with disfavour, and an opinion has been expressed that in respect to the menstrua generally too much has been sacrificed to uniformity. Professor Remington believes that glycerine is too freely used, and that it is objectionable on account of its powerful solvent properties. The professor compares glycerine to an over-enthusiastic friend, who gets the pharmacist into more difficulty than he well knows how to get out of, and expresses his opinion that the proper plan is to use as little of either alcohol or glycerine as possible, or, in other words, that it is necessary to determine the smallest amount of these liquids that would be sufficient to exhaust the drug and to preserve the product.

There is no doubt ground for congratulation to be found in this discussion, for if but a portion of the work shadowed forth in the various suggestions be satisfactorily performed, the pharmacy, not only of the United States, but of the whole world, must be the gainer.

CONGRESS OF THE ITALIAN PHARMACEUTICAL ASSOCIATION.

Our Roman Correspondent writes:—On Monday, the 3rd inst., the representatives of the Italian Pharmaceutical Association closed their sitting at Florence, under the presidency of the Hon. Signor Asperti, Deputy in the Parliament of Italy. The question for deliberation was:—The bases on which to organize the "Associazione Federale Farmaceutica Italiana" (Italian Federal Pharmaceutical Association). These were ultimately settled and the Congress proceeded to the election of office bearers. Professor Luigi Guerri was elected President; Signor Cesare Pratesi, Director of the Pharmacy of the Ospedale Maggiore, Florence, Vice-President; and Drs. Enrico Pegna and Guglielmo Romei, Secretaries. The Congress then commissioned Professor Luigi Guerri as President, and Dr. Pegna as Reporter, to compile a report to be presented to the Senate of the Kingdom on the labours of the Congress relative to the new sanitary code.

In the evening the members of the Congress met in the Cornelis Restaurant at a sumptuous banquet given by the Florentine Pharmaceutical Association, which was represented by its most distinguished office-bearers. Much cordiality prevailed, and among the toasts that of the "Pharmacists of Great Britain" was not forgotten.

THE SALE OF SPIRIT OF WINE.—EXCISE PROSECUTION.

The fact that the question is not unfrequently asked whether a chemist and druggist is allowed to sell spirit of wine would appear to indicate that there exists here and there some uncertainty as to the law on this point. It may be useful, therefore, to quote somewhat prominently an announcement from the *Scotsman* to the effect that on Tuesday last, at the Justice of Peace Court held at Dunblane, three chemists and druggists were fined £12 10*s.* each for selling spirit of wine without a licence, and that a second penalty of a like amount was imposed upon one of them for the offence of selling methylated spirit without a licence. The magistrates recommended, however, that the Excise authorities should if possible make some remission of the penalty in each case.

A DANGEROUS ADDITION TO A QUININE MIXTURE.

A Correspondent of the *Indian Daily News* records a remarkable case of poisoning at Peshawur. A native, having to make up a quinine mixture for the wife of an officer on the station, added hydrocyanic acid as a solvent of the quinine. The mixture was taken and death was instantaneous.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The fourth general meeting was held at the Royal Institution, Nov. 22nd, 1877. The President, Mr. T. Fell Abraham in the chair.

The minutes of the previous meeting were read and confirmed. The donations to the library were acknowledged.

Mr. Michael Conroy, F.C.S., said there appeared in the *Pharmaceutical Journal* of Nov. 3rd, an article relative to a recent prosecution for selling adulterated cream of tartar, which stated that out of six samples obtained from different sources and submitted to analysis, two were found adulterated with barium sulphate. Being curious to know how Liverpool samples would turn out, he procured nine samples from various sources, which he analysed with the result of finding one adulterated, and that only to the amount of 1·3 per cent. The others were all good commercial quality, the tartrate of lime varying from 4 to 6 per cent. He would offer a few remarks on a means of detecting this adulterant, especially as the pharmacopœia gives no qualitative test for its detection. The easiest and most readily applied method depends on the solubility of cream of tartar in solution of potassium hydrate, or in other words its conversion into the neutral soluble tartrate. The Pharmacopœia of the United States gives this test in the following words :—"Bitartrate of potash is dissolved sparingly in water, but freely by hot solution of potass ; whatever remains undissolved by the alkaline solution is impurity." He would recommend this test for its simplicity to those who have not the time to go further into the matter ; but it would of course not do to conclude that any matter left undissolved is barium sulphate, but sufficient would be known to prevent anyone from selling such an article. The plan he adopted for the barium sulphate was to incinerate a weighed quantity, whereby any sulphate of barium present was converted into the soluble sulphide at the expense of the carbon of the tartrate, and this, on the addition of water to the incinerated mass, is further converted into carbonate of barium by the action of the carbonate of potassium in solution. The carbonate of barium, together with the carbonate of lime produced by the decomposition of the tartrate of lime, was then collected on a filter, washed and dissolved in hydrocloric acid, and from this solution the barium was precipitated as sulphate by the addition of dilute sulphuric acid, the usual precaution rendered necessary by the presence of lime being observed.

Mr. Alfred E. Tanner stated that he had also recently examined eight samples of cream of tartar, with the result that all contained tartrate of lime, some to a very large extent; two samples were in addition adulterated with barium sulphate. In view of a case recently reported in the *Pharmaceutical Journal* in which a chemist of Huddersfield was fined on the report of the public analyst, who stated that he found 2 per cent. sulphate of barium in the sample of cream of tartar sold, he would recommend all chemists to examine their stocks of this article, and for this purpose he would propose a very simple test which needed no more special appliance than he hoped was to be found in every pharmacy, viz.—a test tube. One part of the suspected sample should be shaken with ten parts liquor potassa of the Pharmacopœia strength, when if pure it will entirely dissolve; the same result will be attained if the sample contain tartrate of lime ; but if the solution be now heated to boiling, tartrate of lime will be precipitated ; this is owing to the curious property it possesses of being soluble in cold liquor potassa, but not in hot. Barium sulphate, if present, will of course remain undissolved in the first part of the process, and may be distinguished from most other substances by its insolubility in strong nitric acid. There is one caution, however, to be observed in this process. The liquor potassa itself must be ascertained to be free from lime, and as this is not an improbable impurity, he would just state that its absence may be assured by adding a few drops of solution of oxalate of ammonium to the liquor potassa, when the lime, if present, will be shown by a formation of white precipitate. Mr. Conroy had rather questioned whether the presence of tartrate of lime in any sample could be considered an impurity, but he (Mr. Tanner) would remind the meeting that the Pharmacopœia had clearly defined what acid tartrate of potash, or cream of tartar (for they are synonymous), should be, and had provided tests which entirely excluded the presence of more than a trace of lime salt, and he contended that tartrate of lime to the extent of 5 per cent. or more could not in any sense be considered a trace, and further, the last test given, viz., the quantitative one, assumed the absolute purity of the article in question, for it ordered 188 grains of the sample to be incinerated and the alkaline residue to be titrated with volumetric solution of oxalic acid, of which 1000 grains measure should be required for exact saturation. The 188 is the molecular weight of acid tartrate of potash, and this requires one half the molecular weight of oxalic acid in grams, viz., 63 for exact saturation, which is the quantity contained in 1000 grain measures of the solution ; consequently, 100 per cent., or absolute purity, is indicated. Of course we all know whence the tartrate of lime is derived, being contained in the argol or crude tartar ; insufficient purification of this will account for its presence in the finished product. Its separation, however, may be effected by treating the crude tartar with very dilute HCl, which removes the lime salt, and then washing with cold water to remove the acid. His opinion was that the presence of 5 per cent. or more tartrate of lime was quite as much an impurity as was the presence of sulphate of lime in precipitated sulphur. He only wondered that the marvellous zeal in detecting adulteration displayed by public analysts had not before been directed towards such a commonly used and commonly impure article as cream of tartar, and he strongly urged pharmacists to examine this article by the simple test mentioned above before taking it into stock, lest they should find themselves placed in the unfortunate position of the chemist in the Huddersfield case before alluded to.

Mr. Conroy did not think with Mr. Tanner that public analysts would treat tartrate of lime as an adulteration, because it existed in tartar as a natural impurity, and an impurity for which the Pharmacopœia made allowance by stating that the solution "neutralized by ammonia was rendered slightly turbid by oxalic acid." Pereira also states that tartrate of lime exists in cream of tartar to the extent of from 2 to 5 per cent.

Other members having taken part in the discussion of the above subject,

Dr. Charles Symes read a paper on "Pills and Pill Coatings," which is printed on p. 461. In a discussion which followed,

Mr. Conroy said he considered the practice of covering pills with a resinous varnish previous to coating as most objectionable, because the pills were by that means rendered almost insoluble, and that such a practice was unnecessary was evident by the fact that the finest pearl-coated pills in the market are guaranteed free from resinous coating. The gelatine pills made and exhibited by Dr. Symes he considered were very neatly coated, and superior to some of American manufacture which he had seen and which he had heard were sold to a large extent in the United States. They were elliptical in shape, and it was claimed by the manufacturers that pills of this shape were more readily swallowed than the ordinary spherical pills.

The President and Mr. Tanner did not think with Mr. Conroy that resin coating of pills was objectionable, because the influence brought to act upon it when in the stomach immediately removed it.

Dr. Symes replied to the points of discussion of his paper, and a cordial vote of thanks to the author brought the meeting to a close.

THE COVENTRY AND WARWICKSHIRE PHARMACEUTICAL ASSOCIATION.

A well attended meeting of the chemists of Coventry and neighbourhood, with their assistants and apprentices, took place on the 3rd inst., in the Mayoress's Parlour, St. Mary's Hall, Coventry, to consider the advisability of establishing "an Association having for its object the better scientific education of its associates, and the general advancement and mutual improvement of its members."

After the circular convening the meeting had been read, the chairman (Mr. Councillor Wyley) dilated on the great benefits which must accrue from the establishment of a local Pharmaceutical Association. He was desirous of seeing established in Coventry facilities which would afford to the assistants and apprentices of the district better opportunities for the study of the science and practice of pharmacy. He held in his hand, and had pleasure in reading to them, a telegram, received from Professor Attfield, expressing his entire sympathy with the objects of the meeting, and his good wishes for the satisfactory carrying out its intentions. He also read letters of apology, from Messrs. John Wyley, Councillor Phillips, Dudgeon, etc., all of whom heartily supported the movement. He had every reason to hope that the Association would prove not only beneficial to the students, but would serve as a means for the promotion of good feeling amongst the members of the trade.

Mr. G. Walker (Wyley's and Co.) then proposed the first resolution:—"That a society be formed by the chemists of Coventry and district, having for its object the promotion of brotherly feeling amongst its members and their mutual improvement, and the better scientific education of its associates." Mr. Walker observed that the best augury of the success of the movement they had met to establish was the unanimity with which the proposal had been received by the members of the trade. It was reasonable to expect some "cold water" would attend the launching of such a project, but they must contrive by the fire of energy to convert the water thrown into "steam," and thus propel the movement to a useful and prosperous issue.

Mr. W. Litchfield had pleasure in seconding the proposition, inasmuch as any agency for the scientific advancement of their younger brethren must redound to the credit of their employers.

Mr. Stokes Dewson (Hon. Sec., Midland Counties Chemists' Association), in supporting the resolution, remarked that such societies afforded the means of reunion and better acquaintance between those whose interests were identical, and the mutual interchange of ideas on scientific and general topics affecting the trade. Local pharmaceutical classes, properly organized and conducted, were of inestimable benefit to apprentices and assistants, affording the best specific against the evils of superficial knowledge attained by the "cram" system.

The resolution being unanimously carried, Mr. Councillor Sellors then proposed that the society should be called "The Coventry and Warwickshire Pharmaceutical Association." He contrasted the present meeting with one he had attended prior to the passing of the Pharmacy Act, and observed that as their present objects were purely educational it must command the sympathy and support of all connected with the business.

Mr. Whiting, in seconding the resolution, stated that a personal canvass of the district led him to believe that the Association would prove to be the nucleus of a local centre of pharmaceutical education.

This resolution having been carried the meeting elected the following officers for the ensuing year:—President, Mr. Councillor Wyley; Vice-President, Mr. Councillor Sellors; Treasurer, Mr. Alderman Wyley, J. P.; Members of Council, Mr. G. Walker, Mr. Councillor Bird, Mr. Councillor Phillips, Mr. Hodgkinson, Mr. Hinds; Hon. Secretary, Mr. Frederick Barrett, F.C.S.

The President then called upon their newly elected Secretary to suggest a programme for their consideration.

Mr. Barrett, after reviewing the proposed objects of the Association, stated that in towns where such societies existed, it was found that frequent social or scientific gatherings greatly tended to promote better feeling and more harmonious working amongst members of the same trade. He suggested monthly meetings at which scientific and popular lectures should be delivered, papers read on various subjects connected with pharmacy, new drugs, apparatus, etc., exhibited, and their merits discussed. Possibly once a year an extra entertainment might be arranged, to which ladies could be invited, and he would even suggest, as an extra attraction, a dance; being convinced from the mercantile, municipal, and social position of the chemists of the city that such an entertainment would prove not only a matter of enjoyment but a financial success. The society's most important object, however, should be to provide suitable *practical* instruction for its apprentices and assistants. It was too frequently the case that *practical* instruction was either wanting or altogether unsuited for the requirements of the pharmaceutical student. Chemistry could only be taught in the laboratory, botany in the field and by the hedge side, and a knowledge of materia medica and pharmacy amongst the drugs and preparations themselves. For the purposes of the society a room should be engaged where chemical appliances, a library, and the current pharmaceutical periodicals might be placed at the disposal of the students, and he had reason to hope that Messrs. Wyleys and Co. would contribute a valuable collection of materia medica specimens. He hoped to announce at the meeting in January, at which their President (Mr. Councillor Wyley) would deliver the introductory address, an outline of the proceedings for 1878, and a long list of donations towards the funds of the Association.

After a general discussion a cordial vote of thanks to the President brought this highly successful meeting to a close.

SUNDERLAND CHEMISTS' ASSOCIATION.

The annual dinner of the above society was held at the Palatine Hotel, on Wednesday evening, December 5. The chair was taken by the President of the society, Alderman Thompson, and Mr. Harrison Thompson occupied the vice-chair. It was numerously attended by the chemists of the town and several visitors, and all the loyal and professional toasts were duly honoured and responded to.

EDINBURGH CHEMISTS' ASSISTANTS' SUPPER.

The chemists' assistants of Edinburgh held a supper (which they propose shall be annual), on the evening of Thursday, the 6th inst., in the Windsor Hotel, Princes Street; covers were laid for upwards of 100. Mr. John Young (Messrs. Macfarlan and Co.) occupied the chair, and was supported by Dr. Taylor, Dr. Aitchison, and Dr. Linton, Messrs. Taylor and Simpson, a deputation from the Glasgow Chemists' Assistants' Association, and Mr. James Johnstone Taylor. Messrs. Cairncross and Welsh acted as croupiers. After supper the Chairman gave the usual loyal and patriotic toasts which were enthusiastically responded to, that of the Army, Navy, and Volunteers being acknowledged by Captain Watson.

In proposing "Success to our Annual Gathering," the Chairman referred to an attempt to inaugurate an annual social meeting such as the present, made in 1873, but the movement at that time either from apathy or want of support fell through. On the present occasion, however, all this was changed; the preliminary meeting was so enthusiastic and the call so cordially responded to that had it not been that arrangements for the present room had been made and the accommodation thus limited, double the number of tickets might have been sold. In alluding to the present condition of the chemists' assistants of Edinburgh, he stated that as a body they were not only far behind those of London and the larger provincial English towns, but also those of Glasgow and the West of Scotland. He hoped that now they would "gird up their loins and put their armour on," and waking out of their lethargy organize a permanent association, which he trusted would, by bringing them into contact, make them a more united body. Before concluding he welcomed the deputation from Glasgow and acknowledged the kind support given by the medical gentlemen present.

Mr. Welsh, in proposing "The University and Royal Colleges of Physicians and Surgeons," referred to the many illustrious names which had been connected with these institutions. Such men as Simpson and Sime had given to the Edinburgh University a name that would last for ever; such a man also was the late Dr. J. Warburton Begbie. Within the last few months several names had been taken from the roll. Sir Robert Christison had retired from his chair, and Professor Lister and Dr. Matthew Duncan had been removed to another sphere; but they could yet rejoice that among those who are left are found the names of Professor Spence, Dr. Taylor, and Dr. Aitchison.

Dr. Taylor, in replying, said that an overworked doctor was the worst speech maker. He had no command of language, his usual vocabulary consisted of about forty words. His favourite phrases were something like "What do you complain of?" "How long have you been ill?" and so on, all day and every day repeating the same list. Again, it had been said that the less a doctor said the more he was thought of; this made him taciturn. He therefore apologized for any disappointment his speech might cause. He would like to ask the Chairman to explain how he considered the Edinburgh assistants were so much behind others. He had always thought that the Edinburgh chemists and their assistants were unequalled for intelligence and accuracy in this country and in the world, and whatever it might be elsewhere he knew that in this city a physician writes a prescription with the faith that his instructions will be carried out to the letter, and if it should happen that he makes a slip, a nice polite young man calls to point out the error and get it rectified, and meantime the customer is told that the prescription will take some time to make up. He concluded in referring to the University by wishing peace and prosperity within her walls, and expressed a hope that her present prestige would not be lost, but that she should go on and flourish continually.

Dr. Aitchison, in acknowledging the toast on behalf of the Royal College of Physicians and Surgeons, said that he represented what in England was looked upon as a person who did not exist, namely, a Scotchman who had lived in England and had found his way back to Scotland again, and so having some experience of English practice he would like to say a word on that subject. The general practice in England, at least in the provinces, was that every doctor should be his own druggist. He while there kept his own drugs, and might say so without much shame. He did his own dispensing, but he owned that he did it badly. In the town in which he was located there were thirteen practitioners, the leading man was a gold medallist of the London University, a B.A. and M.D., and had been a member of Parliament, and this doctor also sold his own drugs. From his (Dr. Aitchison's) experience of the system, he must say that it was thoroughly bad, both for the doctor and for the general public, and he was very pleased to find that this practice did not prevail in Edinburgh. It was a retrograde movement. At the same time he must say that the Edinburgh chemists got as much for their medicine alone, as did the English prescribing druggist with his advice, or for that part as much as the doctors in most cases got for the same.

Mr. William Inglis Clark (Messrs. Duncan, Flockhart and Co.), in proposing "The North British Branch of the Pharmaceutical Society," said that he regretted that such a young man as himself had been selected to give this most important toast; he would have preferred to hear some one speak who had witnessed its growth and progress. He could not speak of the founders except so far as he had been made familiar with them from books or from hearsay. Among those founders was the late Mr. Duncan, to whom they all owed much; he had revolutionized the practice of dispensing. At the time when Mr. Duncan went to the business ointments were sent out in mussel shells, and pills and powders in odd scraps of paper; he inaugurated a new system, and though by many it was considered a dangerous experiment, yet the experiment turned out a success, and showed the master mind. This was not Mr. Duncan's only improvement; among his formulæ should be mentioned that for citrine ointment, which was retained in the present pharmacopœia. Among founders and contemporaries of Mr. Duncan he would mention Mr. Robertson of George Street and the late Mr. Flockhart. The year 1843 witnessed the formation of the North British Branch, and at that time and since Mr. John Mackay had spared neither time nor trouble in organizing the chemists into a harmonious and influential body, who when the time came were not behind in expressing approval of the compulsory Act, which has proved such a benefit to chemists and druggists at large. Regarding the examinations, it has been said that those of Edinburgh were easy compared to London, but deputations and light thrown on the subject from other sources had proved this to be a mistake. As far as papers contributed to the evening meetings were concerned, Edinburgh was behind, being dependent on outside medical and professional aid to a large extent. This should not be. It was to the young men the Society must look for papers, and in dispensing and daily routine many little things must be met with, which if brought forward would be useful to the Society, besides the personal benefit derived by the essayist, the mind being enlarged, and advantage in the way of association and correspondence were sure to result. Edinburgh chemists had a good museum and a good curator, yet more might be done for it by providing specimens. In London, remarkable specimens and fine crystals are constantly being handed over to the museum, and something more like that might be done there. Among the contributors to whom the museum was indebted were Mr. Brown, of Messrs. Macfarlan and Co., as well as T. and H. Smith, firms which have made Edinburgh the centre of the manufacture of morphia and alkaloids. Chloroform was also an important product, of which there were several makers in the city. Referring to early closing, Mr. Clark said that it was to be regretted that some men who were leaders of the movement as assistants, when they became masters were the greatest offenders. He advised each assistant to speak to his own master on the subject as well as to bring general influence to bear, and also urged upon medical men to ask their patients to come early.

Mr. Robert Stenhouse acknowledged the toast.

Mr. Cairncross, in proposing the Glasgow Chemists' Assistants' Association, welcomed the deputation, and expressed a hope that this meeting would not be their last, and wished that in Edinburgh they could boast of such an Association as Glasgow possessed—it would be better for both masters and men.

Mr. Simpson in replying, said that Edinburgh assistants had much greater facilities for education than they enjoyed in Glasgow, but the Glasgow Society hoped soon to have a museum of their own, and they already had a small library. They never had any difficulty in getting papers for their evening meeting, of which they had six each session, and though they might not be of a very high class, yet he was sure the members all derived benefit from the discussion of the subjects. He thanked the Edinburgh assistants for their hospitality, and hoped that before the end of the session his Glasgow friends would be able to return the compliment.

Among the other toasts proposed were "The Strangers," by Mr. Coates; "The Press," by Mr. McLaren"; "The Ladies," by Mr. F. Clark; "The Chairman," by Mr. Thompson; "The Croupiers," by Mr. R. T. Linton, and "The Committee," by Mr. Chislett.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The first meeting of the session of this Association was held on Friday, November 9, 1877, at the rooms, Britannia Chambers, Pelham Street. The chair was occupied by the President, Mr. J. H. Atherton, F.C.S., and there was a very small attendance of members and associates. After reading the minutes of the last meeting the Hon. Secretary, Mr. Roberts Jackson, announced that the *Pharmaceutical Journal* had been regularly received, and also that he had received a handsome donation of £5 to the funds of the Association from Mr. Edward Harvey, of Giltspur Street, London; also splendidly bound copies of 'Science Papers,' and 'Pharmacographia,' from Mr. Thomas Hanbury (through Professor Attfield), in memory of his brother, the late Mr. Daniel Hanbury. On the motion of the President a hearty vote of thanks was awarded to the donors.

Five gentlemen were elected associates.

The President then presented the prizes in the pharmaceutical chemistry class to the successful associates and complimented the recipients on the excellence of their papers at the examination—Mr. J. Clower obtaining the first prize and Mr. J. Cox the second.

The President then said there being so few members present he should decline to give his inaugural address, and his decision was supported and endorsed by Messrs. Fitzhugh, Bolton, Humphreys, Warriner, and Jackson, who all regretted the apathy shown to the work of the Association and the want of personal support to the officers.

After some discussion it was decided to adjourn the meeting, and a deputation, consisting of Messrs. Bolton and Warriner, was appointed to wait on all members not present, and ask them to attend the adjourned meeting to discuss the position and decide on the future conduct of the Association.

The adjourned meeting was held on the 29th ult., and was the largest meeting of Nottingham chemists ever held.

The chair was occupied by the President, Mr. Atherton, who delivered a most able and telling address, in which he alluded to the large amount of apathy and indifference in the work of such associations, by both members and associates, not only in Nottingham, but in nearly all kindred societies in the country. Being determined to get at the root of the disinclination, at the first meeting of the session, he declined to give his usual address to so few members, and urged the adjournment until a canvass had been made to ascertain the general feeling. The suggestions from members were very various, but the necessity of such societies was a principle unanimously agreed upon, and he called upon the meeting to decide, first, whether the society should be carried on; secondly, in what way to command the sympathy and support of all the members; and thirdly, if it were decided to carry on the society, whether the members would pledge themselves to support it by their presence and sympathy at all its meetings. The President then urged the claims of the society on the support of the members at some length, referred to the work which had been done, and impressed upon the members the moral obligations which bound them to carry on the work of local associations. Educationally he maintained that the passing of the Pharmacy Act of 1868, and compulsory examination for business qualification, rendered necessary in large centres the institution of classes and educational facilities for the young men, and that it was the bounden duty of masters, who by apprenticeship undertook to teach the art, mystery and science of pharmacy, that they should either do so themselves, or provide a means by which such education could be obtained. Socially, he believed that such associations were of enormous value for the good of the trade, a value far beyond direct estimation. The *esprit de corps* thus established, and fostered by intercommunion, and the friendship formed did insensibly but surely raise the moral tone of the trade, and made them carry on their business with due regard to the feelings of others as a trade. Association was invaluable, and the President instanced the many occasions in which great advantage has accrued; and made an earnest appeal to the meeting to show more interest in the work of the society.

The President alluded to some important matters affecting the interest of the trade, and in reference to the prosecution of one of their members (Mr. Shepperley) for prescribing over the counter, confessed his consciousness of the difficulty of discussing the question in a mixed company of chemists, as opinions would vary a little according to circumstances and position. He, however, assumed that on one point they were agreed, and that was, to defend their right to give simple medicines for simple ailments when called upon to do so by the public; the only point on which they might differ was the question of degree. He urged that by indiscriminate prescribing they did the public, the medical profession, and themselves a wrong—they were not qualified for it—and thereby risked the public safety. He felt very strongly that if chemists cultivated this indiscriminate prescribing, and if, by visiting, by private consultation, by the use of instruments, they led the public to suppose that they were qualified to give relief in all cases, they not only evaded the law, but did a material and moral wrong. If, on the other hand, they avoided such matters, he maintained that they were perfectly justified in conducting their business as it had been carried on before the apothecaries existed. To refuse relief would be an injustice to themselves, a great inconvenience to the public, and no advantage to the medical men. By such refusal they would act churlishly to their customers and confess themselves ignorant of the properties of the drugs they were called upon to sell. The medical laws were not instituted for the good of the medical men but for the safety of the public, and as such they would receive the support of all right thinking persons; but if a portion of the medical profession overstrained the law—by injudicious action, for their own monopoly—they would not only have the better part of their own body and the chemists, but also the general public against them. He did not wish to foster or sanction a spirit of retaliation, but if medical men would persist in dispensing medicines, for which duty the chemists and druggists of the land were specially educated, they could not be surprised at some counter practice to enable chemists to eke out a living, impoverished by their own action.

The President then referred to the enormous increase of the sale of patent medicines, and to the illicit competition the chemists of Nottingham were subject to at the present time by a barber and a herbalist, and strongly urged the meeting not to reduce the published price in competition, and gave financial reasons and statistics in favour of his views. He further urged that it seemed a most unjust thing that for the safety of the public chemists should be compelled to educate and pass examinations in order to fit them for the sale of poisons and dispensing medicines, and yet the most ignorant persons may sell the most deadly poisons by means of a government stamp. The Patent Medicine Act should in all fairness be subject to the operation of the Pharmacy Act, and when the time came for a new act, such a scheme would no doubt receive consideration. After referring to the vexatious prosecutions under the Food and Drugs Act, the President alluded to the proposed visit of the British Pharmaceutical Conference to the town in 1879, and expressed a hope that the chemists would give a downright hearty welcome to that body, whose previous visit, in 1866, had called the Nottingham and Notts Chemists' Association into existence.

The address was listened to with great attention, and frequently elicited loud and hearty applause.

Mr. C. W. Dixon, in a short speech, proposed: "That the Association should be carried on."

This was seconded by Mr. James Beardsley, who thought that all the members should assist the council in both educational and trade work, and the resolution was carried unanimously.

Mr. Reuben Widdowson proposed "That the educational work for the associates be carried on as usual." Mr. W. Widdowson seconded and offered to lend the Association a set of botanical specimens, mounted; his offer was thankfully accepted and the resolution was carried.

The President then invited suggestions as to the evening meetings, saying the council were necessarily silent on the matter, but were prepared to carry out the wishes of the members.

A general discussion then ensued in which Mr. Bolton, Mr. Warriner, Mr. Beardsley, and other gentlemen took part, all urging upon members the necessity of working with the council, as well as paying their subscriptions, in order to make the Association a thorough success. Eventually Mr. James Beardsley proposed and Mr. Cowley seconded—"That three social meetings and three educational meetings be held during the session, with special meetings when necessary."

This was carried unanimously, the President remarking that he hoped every member would make it a point of honour to attend the educational meetings as well as the social ones.

Mr. Warriner next proposed a vote of confidence in the officers and council. He thought such a public expression necessary as the want of interest exhibited by the members in the past might seem like want of confidence in the executive.

Mr. C. Fletcher seconded and Mr. J. Beardsley supported the vote, which was carried unanimously.

The President returned thanks on behalf of himself and colleagues.

A very pleasing incident occurred during the evening, three members of the Association, formerly students (Mr. James Beardsley, Mr. Reuben Widdowson, and Mr. W. Widdowson), kindly offered to assist the associates in their studies at the improvement class on Monday evenings. They all warmly acknowledged the benefit the Association had been to them when students, and it is is almost unnecessary to say their generous offer was heartily accepted and thoroughly appreciated by the meeting. It was arranged for Mr. Reuben Widdowson to assist the class in chemistry; Mr. W. Widdowson in botany, and Mr. Beardsley in pharmacy on alternate Monday evenings during the session, and the Hon. Secretary was requested to issue a circular to that effect, with a request that each member would make an effort to allow his apprentices to attend regularly.

Three new members were elected.

A hearty vote of thanks to the President for his conduct in the chair, and for his eloquent address, proposed by Mr. Inger and seconded by Mr. Moore, brought a most successful meeting to a conclusion.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The second monthly meeting of the session of this association was held in the Manager's Library of Anderson's College, the President, Mr. D. Frazer, in the chair. Mr. James M. Fairlie, Vice-President, read the following paper on—

The Pharmaceutical Society and Provincial Education.

Mr. Chairman and Gentlemen,—It seems to me that the question of provincial education, having now been in abeyance for a few years, should be brought to the front and dealt with in a statesmanlike manner by the Council of the Pharmaceutical Society, and as our esteemed chairman has requested me to read to you a paper in lieu of his inaugural address, I have thought I could not take up a better topic. It will be necessary that we should take a brief glance at the past in order that we can realize our present position and make our calculations for the future. First, then, the Pharmaceutical Society in its original programme had the education of its apprentices or students as one of its chief objects, and to that end a School of Pharmacy has been in existence for many years, and no one denies but that through its able professors it has done good service to the cause of pharmaceutical education. Some say that it has been at too great expense that it has been kept up, but I am disposed to think that all the money that has been spent upon it has been well spent, and I believe that if the same amount was spent again, in a similar direction, far more good would result in the future than has been done in the past. I am aware that some of our leading pharmacists hold the view that the time has almost come when the Society should cease to have any control over the education of the students at all, and they look upon it as an anomaly that the Society should both be a teaching and an examining body. I hold that this view should not be entertained for a single moment in present circumstances. If such a step is taken, it will be to my mind a retrograde one and opposed to the principles adopted and carried out by most other bodies having duties and responsibilities placed upon them of a nature similar to those of the Pharmaceutical Society, aye, even and carried out by the Government itself; for what is our present system of national education? Is it not controlled by the State? Are the teachers and taught alike not examined and inspected by the State? Yes, and the State also pays a large share of the expense! Why, then, should there be an outcry against the Society exercising some control over this important matter? I suppose it is almost wholly on the ground of expense. This, I think, is short-sighted policy. Some people do not know how to spend a shilling that they may receive eighteen-pence. Others, again, spend eighteen-pence, and scarcely receive a shilling's-worth of value in return. Looking at the past of the Pharmaceutical Society, I am not disposed to criticize too severely the conduct of the old leaders at Bloomsbury Square, many of whom are now lying in honoured graves; and I do not know that had I been placed in the same cirumstances I would have acted otherwise than they did; but standing as we are now on a higher platform, we can survey the past from a different standpoint, and while I give all honour to the Bells and the Allens, the Hanburys and the Morsons, for their life-long efforts in the advancement of pharmacy, yet I cannot but think that had all the time and money and effort that was put forth year after year in endeavouring to obtain an Act of Parliament been spent in spreading useful knowledge amongst chemists in the country districts, and by establishing in all the large centres schools of pharmacy on the model of that at Bloomsbury, much more good would have resulted. There would, I am sure, have been less jealousy and distrust amongst the different sections of the trade, and a better Act of Parliament would have been obtained, when not only the trade but the country would have been ripe for the kind of legislation necessary. But there is no use looking at the past unless to conserve those good and useful legacies that have been handed down to us by our predecessors, and to improve upon that which we are convinced needs improving. And I look upon the School of Pharmacy at Bloomsbury Square, and its scheme of education as conducted there, as one of the most important of those legacies. But it is well known that all students cannot reach London to obtain the necessary tuition, and at present it is impossible, even in our own city, with all our educational advantages, for any young man to receive the systematic course of training necessary to equip him properly for the work he should pursue in after years in connection with his business. I have already hinted that I think that in the past the provinces have been neglected by the authorities in connection with our Society at London. I am aware that a scheme exists whereby local associations may obtain grants of money and loans of books and apparatus under certain conditions and restrictions; but I am disposed to think that the restrictions are either too severe, or the grants that have been given have been so paltry on the whole, and given with such a grudging hand, that local committees think twice before they make any application at all. The members of Council of late have thought they had nothing to do in this matter but promulgate a scheme, and let it work itself; they passed, so to speak, a permissive bill, but they hemmed it round with so many whys and wherefores that it has practically become a dead letter. What would the people have said of our Government, when they passed the Education Bill, had they left out the provision for the appointment of School Boards in the various parishes and burghs throughout the country? Would education have been any further advanced to-day? I am sure not, and this is just what our Council did a few years ago. They, in effect, said, "We will lay aside a moderate sum for provincial educational purposes, for we acknowledge that we must do something in this matter. We obtain a good deal of money from provincial members of the Society, and we must keep them on and get others to join, to send up their guineas also; and although we send them seventeen shillings' worth of Journals every year, yet we get a profit, and we cannot keep it all in London. But we know our country cousins well enough; they are very slow to move, very conservative, so we will not make this money too easy to get at, for they may, after all, make a bad use of it, and it is far better that we should buy a few more 3 per Cents. than that it should be sent to Birmingham, or Leeds, or Glasgow, to be squandered there, when we would never see it more." This, though a little strained, is practically what they said and have carried out. No local committee would be troubled in the way that is laid down in the scheme. What is required is some simple plan, something that we have been accustomed to in other departments of life, not a new-fangled, intricate scheme, that will take a man half a lifetime to master. It seems to me that there are many plans that should commend themselves to us for their very simplicity. When the hero of the Scottish Reformation accomplished his purpose by overthrowing the tyrant power which tried to crush the Scottish people, he did not attempt to dazzle the inhabitants by promulgating some perplexing scheme for keeping down the old powers, and improving the habits of the people, but he adopted the very simplest plan he could, and in doing so he carried the people with him. He established a school in every parish alongside of the church, and for 300 years Scotland has stood a monument of John Knox's sagacity and forethought. The plan I would propose is perhaps not new. Something like it has certainly been suggested by some one, but if simplicity is a recommendation I think it possesses that element:—First, let the country be divided into, say, twelve districts; second, let the members of the Society in each district elect, every three years, an education board; third, let the Council, at the commencement of each year, set apart a certain sum of money for aids to education, say £600 the first year, thus giving a grant of £50 to each of the twelve districts, which ought to be supplemented by at least an equal sum subscribed locally. By this means the education board would be able to secure two lecturers who would willingly accept the fees obtainable from the classes set agoing, and the bonus of £50 each might go in providing either room accommodation, apparatus, or some other necessary matters that would occur to the board. This plan, I think, has several points in its favour. The issuing of the ballot papers every three years would add an interest on the part of the members of the Society which they could not otherwise take in this matter. The board, once elected, would require to do something in the furtherance of education, or of course the grant would not be paid. The fact of classes existing in a district regularly from year to year, and not in the spasmodic way in which some local associations find it necessary to carry them on at present, would become known to all young men within each radius who would naturally strive to attend one or two sessions. The objection, of course, would come in, where is the £600 to come from? So far as I can calculate of the income and expenditure during the past few years I think the Society might well afford £600 or £700 annually for educational purposes, apart from its endowments at Bloomsbury Square. If we take Scotland alone, as an example, two districts in addition to the North British Branch might answer for the present. We find that during the past year the Scotch examining board made a clear profit of £100 to the Society, apart, no doubt, from those who would become annual subscribers as members afterwards. Thus we, in Scotland, would be but receiving back for educational purposes the excess of income on the examinations, which I hold to be but fair and just, as I do not think the Society should make a single penny of profit out of the hard-earned fees that are paid by the students who present themselves for examination. I am not aware whether the English examining board is as profitable to the Society as the Scotch one. I should fancy it ought to be much more so, as a larger number of students must present themselves at London in proportion. The money difficulty might come in, however, apart from this; but there seem to me to be other ways and means of raising the necessary sum, for as the old saying has it: "Where there's a will there's a way." I would like, for instance, to know whether it is absolutely necessary that all members and associates, subscribing on an average, I presume, about 15*s.* per head per annum to the Society, should receive 17*s.* 4*d.* worth of Journals every year in return. It seems to me that the Society pays heavily for this practically gratis distribution of the Journal. If the Journal was put upon an independent basis, I am strongly of opinion that it would, in the first place, pay better than it does even at present; and in the next, I am certain its editorials and leaders would more fairly represent the opinion of the majority of the trade, and have more independence about them, while its articles generally would be more in keeping with the stage of progress attained by the great bulk of its readers. We need the Journal; we must have at least one highly scientific publication, and no doubt we would get one or more whether it was continued to be sent out by the Society to its members or not, and the trade would willingly pay for it or any other journal, and I do not see why the Society should care to monopolize this particular department. I therefore think that if it is necessary to make any sacrifice for the sake of the funds of the Society, that the education of our youths should not be neglected or left to itself, but that if a "Jonah" must be thrown overboard, let the Journal go to fight its own battle with other enterprises of a similar character. This, no doubt, will sound in the ears of some of our friends as a terrible proposal. I think I hear them say, "We can't do without our official organ; we must have some means of reporting our Council meetings, and we can only allow our own trusted editor and reporter to sit at our side, for it does not do to let the whole world know all that is going on inside." What would the country say if the Houses of Parliament and our town councils were to close their doors against the representatives of the press, and only permit a trusted servant to provide the reports to the nation? It would not be tolerated a single day, and why the members of the Pharmaceutical Society have submitted to this indignity so long is more than I can understand? There is another common objection often raised against the adoption of a thorough scheme of provincial education, namely, that of the smaller towns. If, say, a grant of £50 was made to Glasgow, why should the pharmacists in Greenock or Perth not also establish a little school and get a share of the grant? Looking at the question as a matter of common fairness, one naturally would say, "They are entitled to it, and if they can get up a school, let them elect a board and give them a share of the grant." But I have no great fears of the smaller towns interfering with the grant in this way. Throughout the country there are certain recognized centres, just as London is looked upon as the leading city in the empire. There are always inducements to young men to go from the smaller towns to the larger and more attractive ones, and while a system of teaching would be an additional attraction to the larger towns, I do not think it would militate one iota against the interests of the pharmacist in those outlying towns. I rather think that the advantages are all the other way; each district would be placed upon an equal footing. They would elect their own board, which would superintend the arrangements in its own way. The Pharmaceutical Society could have a check upon the board by having the power to place the local secretary *ex officio* a member of the board, at the same time a guarantee would be required to be given by the board that the grant should only be used for educational purposes. Thus the Pharmaceutical Society having laid the foundation, and placed the edifice of provincial education on a fair basis, it might rest on its oars in that department and watch results for a time with perfect safety, but only, I should say, for a time, for a higher power may step in and re-arrange matters. And I fondly look forward to the time when no youth shall be apprenticed until he has passed his "Preliminary" examination, when the "Minor" examination shall be the test for assistantships alone, and the "Major" the only portal by which a pharmacist shall be able to commence business on his own account. Then our young men shall be looking for their education within the walls of some of our local universities and science colleges, and by that time, I trust, that in each of these halls of learning a chair of pharmacy may be established and endowed, partially by the Government, partially by the Pharmaceutical Society, and partially by local effort.

And now, in conclusion, let us look at our own position as a local association. Are we prepared to enter upon some such plan as I have here sketched out? We are certainly more peculiarly situated here than in any other district, and there is the more necessity for something being done, and that quickly. Our spasmodic efforts have been quite as successful as might be expected in the circumstances, but we have had no system, and where there is no system there is not that thoroughness without which our efforts are practically worthless. I know from my intercourse with the young men that they are anxious for something being done. I know also that there are teachers in the city able and willing to give their services if the smallest encouragement, such as a grant from London, would give, were forthcoming; and I believe, further that the employers have but to be appealed to to giyewhat assistance is needed in furtherance of such a scheme. I do not see why in a city like Glasgow at least £100 should not be subscribed annually for the upkeep of a set of classes in conjunction with a library and museum. I know what our young men can do when they make up their minds. But for them no library, I believe, would yet have been in existence in connection with our Association. But for them the business hours would have been kept stretched out much longer than they are. And I am convinced that in this matter they have it pretty much in their own hands; also, and as it is the young men who will mainly benefit by such a reform, I would say let them keep steadily in view the ideas associated with three words, namely, Educate! Unite! Progress!

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, December 6th, Dr. Gladstone, President, in the chair. After the confirmation of the minutes, the list of presents to the library was read, and the thanks of the Society voted to the respective donors. The following certificates were read for the first time:—Messrs. R. Bodmer, T. F. Harris, A. Jamieson, G. E. Stodart, W. Watson.

The President then announced that Professor Odling was again unfortunately prevented from reading his paper on Gallium, but that his assistant, Mr. Fisher, was present, and would give an abstract of it to the Society.

Mr. Fisher apologized for the absence of Professor Odling, stating that the lecture would have been deferred but for the fact that the specimens had to be returned shortly; he hoped, however, that Professor Odling would give to the Society some theoretical considerations on the new metal at a future date. The following is a summary of the facts stated:—Gallium was discovered by Boisbaudran 27–29th August, 1875; it was first obtained in the metallic state in November, 1875. The spectrum consists of two bands in the violet, one brilliant, of wave length 417, and a feeble band of wave length 403·3. It was extracted in the first instance from zinc blende of Pierrefitte, a mine in the Pyrenees, afterwards from a black blende of Bensberg on the Rhine; the latter contains one part in 100000, the former one in 400000; 0·65 grams of gallium being obtained from 430 kilogrammes of Pierrefitte blende. In appearance it resembles lead, but is less blue, tarnishing slightly on exposure to moist air; it is slightly harder than lead, flexible, malleable and can be cut with a knife. It is not appreciably volatile at a red heat, and is but slightly attacked by oxygen at that temperature. Its sp. gr. is 5·9; when fused 6·08. It melts at 30·15 C., presenting a brilliantly white appearance; when once fused it remains liquid even for several months at 0° C., but is immediately solidified when in this condition by contact with solid gallium. In consequence of this curious phenomenon of surfusion, the element was at first described as a liquid metal. It crystallizes in square octohedra. In properties it is more or less intermediate between aluminum and indium. The solutions of its salts give the following reactions:—With ammonia a white gelatinous precipitate, soluble, but not freely, in excess; potash a similar precipitate, soluble in excess; acetate of ammonia on boiling, in a solution free from excess of acid, precipitates a basic compound; carbonate of baryta easily precipitates salts of gallium in the cold. The salts already prepared are the sulphate, which is very soluble but not deliquescent; the chloride very soluble and very deliquescent, decomposed by a large excess of water; and the alum. A solution of the latter on heating deposits a basic sulphate, which dissoves again on cooling.

In reply to some questions by the President and Mr. Groves, Mr. Fisher stated that no satisfactory determinations of the atomic weight or specific heat of the new metal had yet been made, and pointed out that the small quantity (0·65 gram) had prevented M. Boisbaudran from fully investigating some other reactions. Specimens of the metal and the alum were exhibited.

The next paper was "*On Nitrification: a Report of Experiments conducted in the Rothamstead Laboratory*," by R. Warington.—After pointing out the technical importance of the above process, and the want of knowledge as to the production of nitric acid from nitrogenous organic bodies the author states that it has been generally assumed when such bodies decay in a porous medium offering a sufficiently large surface for oxidation that nitrates must necessarily be formed. This view has, however, never been confirmed by exact experiments. In February last, Schloessing and Müntz (*C. Rend.*, lxxxiv., 301) laid before the French Academy a paper proving, in their opinion, that nitrification was due to the action of an organized ferment. Their fundamental experiment is the following:—A glass tube, one metre long, was filled with a mixture of 5 kilos of ignited sand and 100 grm. of powdered limestone; through this mixture a slow stream of sewage filtered, so that it occupied eight days in passing down the tube. During the first twenty days no nitrates appeared in the exit water; after this period they could be detected, the quantity rapidly increased until no ammonia could be found in the exit water; this continued for four months. A small vessel of chloroform was now placed on the top of the tube, so that the vapour passed down through the soil (this reagent effectually suspends the action of organized ferments, whilst it has but little effect on soluble ferments [*C. Rend.*, lxxx., 1250]). In ten days all nitrates disappeared, and the ammonia salts passed through unchanged. After fifteen days the chloroform was withdrawn, but no nitrification took place during seven weeks. 10 grms. of a soil which was known to nitrify were now treated with water and the washings poured on the column of sand, so as, if possible, to seed the soil anew. Eight days after, nitrates again appeared as before. The importance of this new theory is clearly very great, so the author has tested it by further experiments in two distinct lines of proof:—(1) The action of antiseptic vapours in preventing nitrification. Four tubes were filled with moist kitchen garden soil; through the first moist ammonia—free air was drawn by an aspirator; through the second moist air as before, but passed previously through a bottle containing sponge moistened with carbolic acid; the air drawn through the third tube was similarly charged with a little bisulphide of carbon; that through the fourth with chloroform. Two series of experiments were made. At the end of the experiments the nitrates formed in the soil were determined by the method of Crum and Frankland. The results are given in the following table, the experiments lasting thirty-nine and forty-six days respectively:—

Nitrogen as nitrates and nitrites per million of air-dried soil.

History of Soil.	First experiment.	Second experiment.
Original soil	6·12	8·91
Air passed	40·87	50·86
,, ,, with carbolic acid .	17·20	40·77
,, ,, ,, carbon bisulphide	6·70	9·75
Air passed with chloroform .	9·48	7·86

The results of these experiments prove that chloroform and bisulphide of carbon effectually prevent nitrification; that carbolic acid is probably effective to the extent in which it comes in contact with the soil. So antiseptics as a class are inimical to nitrification. The second line of proof investigated was the possibility of inducing nitrification by seeding with a substance already nitrifying. After several unsuccessful attempts the author succeeded in nitrifying practically the whole of an ammonium salt. Four stoppered pint bottles were taken and nearly filled with a solution of ammonic chloride (1 c.c. = 0·000025 gram ammonia) to which a small quantity of acid phosphate of potassium was added; two of the bottles were seeded with about 1 gram of surface soil from a "fairy ring;" one unseeded and one seeded bottle were kept in the light, the other two in the dark. In three months time the seeded bottle in the dark contained abundance of nitric acid and no ammonia, the other three contained plenty of ammonia but no nitric acid. 1 c.c. of the liquid which had undergone nitrification was now added to each of the unseeded bottles, one in the light and one in the dark; 0·005 gram of acid tartrate of potassium to supply organic carbon was also added to each bottle; in a month the bottle in the dark contained abundance of nitric acid, the one in the light was unnitrified. The conclusions of Schloessing and Müntz have thus been completely confirmed with the addition of the important fact that darkness is apparently essential to the action of the nitrifying germs.

After the thanks of the meeting had been given to the author for his important communication, Dr. Gilbert said that it now seemed strange, having the parallel of the acetic acid fermentation, that this important process had remained so long uninvestigated; in his opinion the experiments of Schloessing and Warington left no doubt as to the correctness of their explanation of the process. Dr. Gilbert then drew attention to the great variety which had been found to exist in the power possessed by soils and plants to nitrify in different degrees; thus one soil would nitrify four to five times as much as another under similar conditions.

Mr. Howard said that the value of old nitre beds as compared with new ones had long been appreciated but not understood, the paper of Mr. Warington afforded a satisfactory explanation of their value. He would like to ask if any substances, such as spongy platinum, besides the ferment, possessed the power of nitrification.

Mr. Tidy did not quite understand the relative action of light and darkness on the process, as the bottles exposed to the light were for such a long time, *i.e.*, during the night, in darkness.

Mr. Kingzett inquired whether the presence of oxygen was necessary.

Dr. Frankland could but express his admiration of the paper; the subject was one of the greatest importance. He would suggest that some experiments should be made to try and assist the action of these industrious, inoffensive mycoderms. For instance, an acre of soil, six feet deep, will dispose of the sewage of three thousand people, it would be very desirable to increase this nitrifying power five or even one hundred fold, and in his opinion it was quite probable that the rate might be much increased.

Mr. Hartley thought that the strongest evidence of the presence of an organism was the fact that the process would not go on without the presence of organic carbon.

Dr. Armstrong pointed out that all known instances of the action of unorganized ferments could be resolved into simple effects of hydration; in every case there was a splitting up of a complex molecule. With organized ferments, however, a complication in structure was often produced. The absence of nitrification in the bottles exposed to light might be due to the presence of chlorophyll containing organisms.

Mr. Warington, in reply, stated that it was by no means asserted that nitrification could not take place without an organism, but that for the process to go on in soil in this rapid way the presence of the organism was requisite. In answer to Mr. Tidy he could throw no light on the fact that darkness was necessary for the process. No attempt had been made to specially aërate the liquids in the bottles. He would not like to say without further experiment that the presence of organic carbon was essential for nitrification; but from analogy he should conclude that it would be necessary.

The next paper—

On Potable Waters by E. J. Mills, D.Sc., was read by Mr. Perkin. After a consideration of the processes for determining the organic constituents of water the author concludes that the process of Frankland and Armstrong must form the philosophical starting point in an endeavour to solve the problems of water analysis and refers to it exclusively throughout his paper. He first considers in an elaborate manner the errors incidental to this process, and compares them with those found in Gmelin in determinations brought forward as evidence of the composition of various bodies, and finds that the accuracy of the process compares favourably with that of the ordinary combustion process and may be safely used as a basis of inference. As regards errors, the author discriminates in blank experiments "a" the chemical error due to the introduction of sulphites, and "b" the volume error from the addition of n cubic centimetres of purified water. The size of the dish used to evaporate the water has a perceptible effect, thus, with a three-inch dish the organic carbon =·323, organic nitrogen =·024, with a six-inch dish $C=0·307$, $N=0·034$, the carbon diminishing and the nitrogen increasing with the size of the dish. The author then describes a new evaporator which consists of a cylindrical copper water-bath with a hemispherical copper cover cooled by a flow of water; the water is contained in a three-inch glass dish underneath the cover and is supplied by a constant, convectionless feed; a stream of purified heated air is drawn across the top of the glass dish by an aspirator. In an hour, with a current of 1062 litres 100 c.c. will be evaporated. From a consideration of the analyses in the Sixth Report of the Rivers Commission the author has arrived at three natural constants or ratios of organic carbon to organic nitrogen in potable waters, α $3·067\ C_{12} \div N_3 = 3·429$; β $2·521\ C_{12} \div N_4 = 2·571$; γ $2·056\ C_{12} \div N_5 = 2·057$.

In conclusion the author makes some interesting suggestions as to the origin of the constancy of the composition of the air, the effect of an alteration in the mass of atmospheric oxygen, etc.

The next paper was—

On Some Derivatives of Allylacetone. By J. R. Crow.—The acetone was prepared according to Zeidler's method, diluted with an equal volume of ether, and transferred to a flask surrounded by cold water, and containing a volume of water twice as great as the ethereal solution. The flask was connected with a reversed condenser, and an excess of sodium gradually added. The ethereal solution was separated, and distilled after drying with potassium carbonate. After the ether had distilled over, the remaining liquid came over chiefly at 135–140°. After repeated fractional distillations it yielded the pure substance, boiling at 138–139°, having the composition $C_6H_{12}O$, sp. gr. 1·842 at 16·2°. It appears to be a secondary alcohol, and a homologue of allyl alcohol. Its acetate was prepared as a colourless liquid, boiling at 147°–149°. A dibromide was also formed by the action of bromine as a slightly brown thick mass, which did not crystallize; it has the composition $C_6H_{12}Br_2O$.

The next communication was—

On a Fourth Method for Estimating Bismuth Volumetrically. By M. M. P. Muir.—It has been shown by Sonchay and Lenssen (*Ann. Chem. Pharm.*, cv., 245), that normal bismuth oxalate on boiling splits up into a basic oxalate of the composition $Bi_2O_3 2C_2O_3$+aq., but slightly soluble in nitric acid; the author has utilized this reaction for estimating bismuth. An excess of saturated solution of oxalic acid is added to the solution containing bismuth, the precipitate allowed to settle, the supernatant liquid poured off, the precipitate boiled with water until free from acid. The residue is now dissolved in dilute hydrochloric acid and titrated with permanganate. The absence of free hydrochloric acid must be secured before precipitating. The results are accurate, and the method is generally applicable.

The next paper was—

The Gas of the Grotto del Cane. By T. G. Young.—The author has analysed the gas, which contains 61·5 to 71·0 per cent. of carbonic acid. The residual air having the composition, oxygen, 20·25, nitrogen, 79·75. Finot (*Chem. News*, 35, 21) states that in the residual air there is more oxygen than in ordinary atmospheric air. The author cannot confirm this statement. The temperature of the cave in some places is as high as 40°.

The last paper was entitled—

Note on Tetrabromide of Tin. By T. Carnelly, D.Sc., and L. T. O'Shea.—A piece of combustion tubing was bent into the shape of a capital V and W joined together; in the middle bend some tin was kept melted; bromine was dropped from a tap funnel into one of the other bends. The metal burns in the bromine vapour, and the tin bromide condenses in the third bend. By distillation the body was obtained pure as a colourless liquid, solidifying to a mass of colourless crystals. Melts at 30° C. Boils without decomposition 201°. Does not fume, and is very slowly decomposed in air; dissolves in cold water without immediate decomposition. It gave on analysis Sn 27·11 Br 72·78. The vapour density was found to be 229.

The Society then adjourned to Dec. 20th, when the following papers will be read:—

1. "The Constitution of the Terpenes and of Camphor." by Dr. Armstrong. 2. "Communications from the Laboratory of the London Institution," by Dr. Armstrong. 3. "Hydrocarbons obtained from *Pinus sylvestris*, with Some Remarks on the Constitution of the Terpenes," by Dr. Tilden. 4. "Cuprous Chloride and the Absorption of Carbonic Oxide and Hydrochloric Acid," by J. W. Thomas. 5. "The Action of Reducing Agents on Potassium Permanganate," by F. Jones. 6. "On Citric Acid as a Constituent of Unripe Mulberry Juice," by Dr. Wright and Mr. Patterson.

BRITISH PHARMACEUTICAL CONFERENCE.

Meeting of Executive Committee, on December 5, 1877, at 10.30 a.m., at 17, Bloomsbury Square, London.

Present—G. F. Schacht, Esq., President, in the chair, Professors Redwood and Attfield, Williams and Thresh.

The minutes of the previous meeting were read and confirmed.

The late Treasurer (Mr. Schacht) reported that, in accordance with the instructions given him at the previous committee, he had disposed of the Russian securities of the Bell and Hills Fund, and had re-invested the proceeds in consols. Also that there had been transferred from the General Fund to the Bell and Hills Fund the sum necessary to raise the income of the latter fund, from consols, to a clear ten pounds a year. The Treasurer's books and documents had been handed to his successor, Mr. Ekin.

The Hanbury Books.—Professor Attfield reported that in accordance with the wishes of Mr. Thomas Hanbury and with the instructions of the Committee he had sent a copy of 'Pharmacographia" and of the late Daniel Hanbury's "Science Papers" to the libraries of the pharmaceutical associations of Bath, Birmingham, Nottingham, Exeter, Liverpool, Edinburgh, Brighton, Bradford, London, Bristol, Glasgow, and Plymouth, and that he had received very hearty acknowledgments from the officers of the respective societies. A printed copy of the following statement had been placed inside the cover of each book:—

"In 1877, Thomas Hanbury, Esq., in memory of his late brother, Daniel Hanbury, F.R.S., presented thirty copies of each of these books to the Executive Committee of the British Pharmaceutical Conference, with the request that a copy of the 'Science Papers' and of the 'Pharmacographia' should be given to the library of the pharmaceutical association of every one of the fifteen towns in which the Conference had already met or where it would assemble during the succeeding fifteen years."

Dr. Alfred Senier was appointed Assistant-Secretary, at a salary of £40 per annum, to commence from Nov. 1, 1877.

The Senior Secretary was instructed to write to Mr. Siebold as soon as the editorial work of the current year was quite completed, offering him the editorship for the year 1877-8, on the following terms:—

1. That the salary be £150, payable when the completed volume is issued by the printers.

2. That the manuscript of the Year-Book be placed on the table at the annual meeting at Dublin in August, 1878, complete in every respect excepting the introduction.

3. That the introduction be completed and forwarded to the printers on or before Oct. 1, 1878.

4. That no manuscript be interpolated in the printed proofs without the permission of the President or one of the General Secretaries.

Professor Redwood proposed and Mr. Thresh seconded a resolution in accordance with the five previous paragraphs.

Professor Attfield submitted a proof of a circular of invitation to membership, proposed to be sent to all persons interested in pharmacy in Ireland, provided such action met with the approbation of the Irish Committee now being formed to promote the success of the meeting in Ireland in August, 1878. The Committee accepted the proof and ordered copies to be printed and circulated, subject to the wishes of the Irish Committee.

The Secretaries submitted an account of receipts and disbursements since the previous meeting of Committee.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held at 17, Bloomsbury Square, on Thursday last, December 6, when a paper was read by Mr. R. H. Parker, on "Coal Gas, its History and Manufacture."

The author divided his subject into four heads:—I. History. II. Composition. III. Manufacture. IV. Details of Apparatus. Under the first head was given a description of naturally-formed inflammable gases, and the notice they attracted in early ages, followed by a detailment of the many steps by which the manufacture of gas from coal attained its present dimensions. Composition included tables showing the principal gases evolved from coal by its destructive distillation, and the proportion they bear to one another. The bodies upon which the illuminative power of the gas depends were next considered, and the statement that the illuminative power of gaseous bodies depends upon the percentage of carbon contained in them was shown to be incorrect, inasmuch as a mixture of gases could be obtained containing less carbon than marsh gas, but burning with a more luminous flame. Under manufacture was given the qualities which coal must possess to yield a good product, the heat best suited, and the method of determining the value of coal for the production of gas. The process of manufacture was followed from the introduction of coal into the retort, the formation of gas, its passage through the hydraulic main, condenser, exhauster, washer, and scrubber to the holder. Each separate piece of apparatus was fully detailed, and was illustrated by means of diagrams. The purifier received considerable attention, the action of the various deleterious gases upon the lime and oxide of iron contained in them was described, and the description was supplemented by numerous equations showing the decompositions. The construction of the station-meter, tell-tale, and consumer's meter, was explained, and the author concluded his most interesting paper by noticing two methods for the production of gas other than by the distillation of coal.

A vote of thanks to Mr. Parker was unanimously agreed to, and the meeting adjourned till Friday, January 4th.

Parliamentary and Law Proceedings.

Adulterated Sweet Spirit of Nitre.

At the Ryedale Petty Sessions, on the 23rd Nov., John Kneeshaw, grocer, of Farndale, was charged under the Food and Drug Acts, with selling sweet spirit of nitre not according to quality required. The inspector deposed that on the 24th September he purchased at defendant's shop six ounces of sweet spirit of nitre, which he divided into three parts, sending one portion to Mr. Fairley, county analyst, of Leeds. The certificate of that gentleman showed that the mixture corresponded to 34 parts water added to 100 parts sweet spirit of nitre, and that the liquor did not contain any "nitrous ether," the substance upon which the medicinal virtue of sweet spirit of nitre entirely depends. The mixture was, in fact, 16 degrees under proof, whilst genuine sweet spirit of nitre is 53 degrees over proof. The bench ordered defendant to pay £1 fine and costs.

A similar charge was also preferred by Inspector Milner against Charles Frank, grocer, of Hutton-le-Hole, but in this case the analyst certified that the mixture corresponded to 33 parts of water added to 100 parts of sweet nitre, and that it did contain "nitrous ether," though less in proportion than would be in the genuine article, which is 53 degrees over proof, whilst that sold by Frank was only 2 degrees over proof. The defendant was ordered to pay 12*s.* 6*d.* fine and costs.—*Selby Times.*

Important Decision upon the Law of Trade Marks.

In the Common Pleas Division (sittings at *Nisi Prius*, before Mr. Justice Lopes and a common jury, whose services were, however, dispensed with after the case had proceeded a short time), the case of Hickisson and another *v.* Murphy has been heard. It was an action for the alleged piracy and infringement of the plaintiffs' trade marks—that for Bond's marking ink.

The defendant pleaded that the plaintiffs had no exclusive right to the trade marks, and that he was the legal successor and representative of one of the original inventors.

Mr. Collins, Q.C., Mr. Yeatman, and Mr. E. C. Willoughby appeared for the plaintiffs; Mr. H. Matthews, Q.C., and Mr. Finlay for the defendant.

Mr. Collins, Q.C., in stating the case, said the original inventor of "Bond's marking ink" was one John Bond, who died in 1848. At his death three persons became entitled to use it, viz., John Bond's widow, who traded under the name of Bond, and who was known in the trade as the "Widow Bond," the plaintiff, Mr. Hickisson, who married in 1849 a daughter of John Bond (he traded under the name of "the daughter of John Bond"), and Henry Bond, brother of the original inventor. The two first were still alive. Henry Bond gave up his business to his son Edwin, who died in April, 1867, leaving a widow Arabella, who carried on the business of a chemist as well as a marking ink manufacturer. In February, 1870, Arabella sold the business of a chemist to the defendant's husband, but reserved to herself the right of manufacturing the marking ink. She married a man named Christian shortly after, and died in June of the same year. Christian continued to carry on the marking ink business. The employment of the name by another person for the purpose of describing an imitation of their article was an invasion of the right of the original manufacturer. This the defendant had done. He purchased the chemist's business only, and yet he was selling marking ink with the name of "Bond" on the cases and wrappers, advertising that he was the real successor, and inducing people to believe he had a right to do so. He had imitated as closely as possible the pedestals, wrappers, labels, and words on them. Evidence bearing out the opening statement having been given by Ann Christian, William Christian, James Hickisson (who said he was "the daughter of John Bond"), Peter Simmonds, and others, Mr. Matthews, Q.C., contended that the defendant having purchased the right of the chemist's business had the right of manufacturing the ink in question, and there was sufficient distinction between the colours of the wrappers and the wording of the labels to prevent the public being misled into the belief that the inks were identical.

Mrs. Murphy, who admitted she had never registered Bond's name, but only her own, and several other witnesses were called, who admitted that people generally asked for "Bond's" ink. The trade, of course, knew the difference, and would not be deceived.

After a long legal argument, especially on the question of whether fraud was necessary on defendant's part,

Mr. Justice Lopes, in giving judgment, said he was of opinion that the defendant had made the representation that the ink was "Bond's;" that there was no right either under the agreement or by licence to do so; that there was in addition a general resemblance calculated to deceive an unwary purchaser; and that the defendant had fraudulently acted. He found £15 by way of damages for Hickisson and £10 for Christian (the plaintiffs not asking for damages), and he also granted a perpetual injunction against the defendant, his agents, and servants, with costs.

The case, which lasted three days, was then concluded.

Dispensing Memoranda.

The Meaning of Symbols used in Prescriptions.

It appears from the discussion which has been carried on through the medium of the Journal, that much difference of opinion exists with reference to the meaning of signs used for representing quantities in medical prescriptions. The question first raised in these pages had reference only to the symbol (℥) for the ounce apothecaries' weight, but the discussion has since taken a wider range and other signs have been referred to by correspondents, who seem to be in doubt as to their meaning. It is to be regretted that any uncertainty should exist on this subject in the minds of those in the performance of whose duties it is of the utmost importance that they should use weights and measures with exactness. Some complication has undoubtedly been caused by changes which have been made in the weights and measures ordered for use in medicine, but I cannot think there is any substantial difficulty in understanding what the correct interpretation is of the terms or symbols referred to in this discussion.

It may perhaps contribute to the clearing up of any still existing doubts if reference be made to the legal position of the question.

By a law passed in 1824, the meaning and value of the terms used for expressing the integers of weight according to the troy and also the avoirdupois weights were explained and established; and by a law passed in 1835 it was enacted that after that date "all articles sold by weight shall be sold by avoirdupois weight, except gold, silver, platina, diamonds, or other precious stones, which may be sold by troy weight; and drugs, which, when sold by retail, may be sold by apothecaries' weight." In 1858 the Medical Act authorized the General Council of Medical Education to describe in the British Pharmacopœia "the true weights and measures by which medicines are to be prepared and mixed."

We thus have, as the result of modern legislation, four systems of weights which have been legalized, two of which—namely, the troy and avoirdupois—are accurately described and defined on sound scientific principles, while the other two are made up of integers taken from the preceding, in one case with intermediate integers introduced for the purpose of making it more suitable for use in prescribing and dispensing medicines. The law indicates the purposes for which these weights may be respectively used. All other weights are illegal if used in the sale of goods in this country, and penalties are incurred by their use.

With reference to measures of capacity, the case is more simple. The Acts already referred to specify only one system of measures of capacity, of which the imperial gallon is the integer. The value of this has been accurately defined with its multiples and sub-multiples, which are the only measures that can be legally used in the sale of articles in this country. A slight modification of this system has been adopted by the Medical Council in ordering the measures to be used in preparing and dispensing medicines, which consists in adding to the gallon and pint, a fluid ounce, fluid drachm, and minim. These had previously been introduced as medicine-measures, and they have become familiar from long established use.

At the time of the publication of the British Pharmacopœia, apothecaries' weights were exclusively used in the formulæ given in the London and Edinburgh Pharmacopœias, and also in medical prescriptions throughout Great Britain. But since 1850 the Dublin Pharmacopœia had adopted a different system, in which the avoirdupois ounce was divided into drachms, scruples and grains, all of which had different values from those used in England and Scotland.

The reasons which induced the Medical Council to follow the example of the Dublin College of Physicians in taking the avoirdupois pound and ounce as integers of weight, and to avoid their example in dividing the ounce into parts having the same names and symbols as those of apothecaries' weights but with entirely different values, are fully explained in the preface to the first edition of the British Pharmacopœia. There were strong grounds of objection to such a division of the avoirdupois ounce as the Dublin College proposed, but it is sufficient to say that the College had no legal authority for introducing such a system, and the question need not therefore be complicated by further reference to it.

We have only two systems of weights specially designed for use in medicine and legally authorized: namely, the apothecaries' weight, in which the troy pound, ounce, and grain are supplemented with the drachm and scruple, and the weights of the British Pharmacopœia, consisting of the avoirdupois pound and ounce with the troy grain. The integers in each of these systems have their distinctive signs or symbols which are intended for use in prescriptions, and it is important to observe that where integers of the same name have different ponderable values they are distinguished by having different symbols. Thus, for example, the symbol for the troy or apothecaries' pound is ℔, whilet he symbol for the avoirdupois pound is lb., the absence of the bar across the letters serving to distinguish the latter. The troy or apothecaries' ounce has its characteristic symbol ℥, while the avoirdupois ounce, as ordered for use in medicine, is represented by the symbol oz. The grain being the same in both systems, no difference in the symbols was required.

It was obviously intended or desired, in introducing avoirdupois weights with the troy grain (for there is really no avoirdupois grain) into the British Pharmacopœia, and recommending them for use by medical men in prescribing, that these weights should ultimately supersede the use of the old apothecaries' weights, and thus simplify the practice of pharmacists by making one system of weights applicable for all their requirements; but it could not have been expected that practitioners would at once or for many years completely adopt the new arrangement, and hence the necessity that each weight should have its distinctive sign. The sanction given by the Medical Council in the last edition of the Pharmacopœia to the use in prescriptions of the symbols ℈ and ʒ in place of writing gr. 20 or gr. 60, was intended, as there stated, for the purpose of promoting convenience and accuracy in prescribing and dispensing. How this sanction could be construed into an authority to use or interpret the symbol ℥ as having any other meaning than that of the troy or apothecaries' ounce of 480 grains, I am at a loss to understand. The only excuse I know of for opinions which have been expressed to that effect is, that physicians sometimes use the symbols referred to in a way in which they were not intended to be used. This is a part of the subject, however, which I do not purpose discussing, my object being to endeavour to explain the strict meaning of the terms or symbols used for indicating quantities in medical prescriptions, in reference to which I may add that I have consulted one of the members of the Pharmacopœia Committee of the Medical Council, who entirely approves of the views herein expressed.

T. REDWOOD.

17, *Bloomsbury Square.*

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[21]. AVOIRDUPOIS *versus* TROY OUNCE.—I consider that the adherents of the troy ounce are scarcely consistent in their practice, however virtuous they may be in theory. Mr. Wilkinson says, "In the P. L., 1851, we find the sign ℥ used to indicate one ounce of 480 grains, and that being the latest authoritative interpretation of the sign, I consider that it is still in force." He then gives a formula containing ℥j by way of illustrating his mode of procedure in his adherence to the troy ounce. However, he says again, "No doubt, if any one customer or physician sent to me for a number of articles and wrote ℥j, ℥ij, ℥iv, and so on, I should supply the articles by avoirdupois weight, because that would be a commercial transaction; but, when ℥j is written in a prescription, I conceive it is used as a multiple of ʒj, and should be so interpreted." This is inconsistent; it is scarcely likely that a physician attaches a different value to each case. Why does not Mr. Wilkinson follow out his troy ounce in both cases? Physicians *may* write ℥j to represent 480 grains; from the examples given by Mr. Mackay one may gather some evidence that they do, but I believe that in the majority of cases in which ℥j is written the ounce of 437½ grains is meant. How to know when one or the other is meant is the puzzle. For example, I take two *bonâ fide* formulæ from recent dispensing experience:—

No. 1.

℞. Veratriæ . . . . gr. xv.
Adipis . . . . ℥j.

Fiat Unguent.

No. 2.

Potass. Bromid. . . . . . ℥j.
Infus. Calumb . . . . ad ℥viii.

Sig.: A tablespoonful a dose.

No. 1 is from the pen of a physician who frequently orders veratria ointment of Pharmacopœia strength, but at times wishing it stronger in veratria, writes it as given above, and it is very evident that he means the Pharmacopœia ounce of lard; at any rate it is as evident as that in No. 2, the prescriber's intention was to give 30 grains of bromide in each dose, supposing ℥j to mean 480 grains. My experience of prescribers is in accord with that of J. S. W., in that when they wish to be accurate, they either write grs. or drs. For example:—

℞. Citrat. Potass. . . . . gr. 180
Tr. Digitalis . . . . . . ʒj.
Inf. Calumbæ . . . ad ℥vj.

Sig.: A tablespoonful; and

℞. Pot. Iodid. . . . . . . ʒxij.
Tinct. Aconite . . . . . ʒiss.
Inf. Chiratæ . . . . ad ℥vj.

Sig.: A tablespoonful.

These I do not manufacture for the occasion.

In my former letter I asked the question, "How do you know that when a physician writes a prescription for ℥j he intends 480 grains to be dispensed?" Neither Mr. Wilkinson nor Mr. Mackay answered this question. Mr. Mackay gave a few (?) reasons for his adherence to the troy ounce; none of his reasons, however, contain satisfactory evidence in favour of it. Mr. Tanner, in reply to this question says, "Because he has used a sign which never had, and is never likely to have, any other value; and, therefore, conversancy with the 'latent' intention of prescribers is not needed." Mr. Tanner here overlooks the fact that the important point is not what value the ℥ has of itself, but the value that is by the writer assigned to it; consequently it seems to me that conversancy with the "latent" intention of prescribers is very much needed. Mr. Mackay and Mr. Tanner say that my statement that troy weight is practically obsolete is incorrect. Mr. Tanner adds, "as well might beef-steaks, tea, sugar, etc., be considered obsolete." I withdraw my statement at their instance. This discussion will have shown Mr. Tanner that troy weight is not of quite such general adoption as the articles of which he makes mention.

It is beyond question that the ℥ sign is used to represent the avoirdupois ounce more frequently than it is used to represent the troy ounce. Physicians know this very well and they are not justified in using it to represent 480 grains when they have their choice of expressing their quantities in grains or drachms.

The use of any but the avoirdupois ounce is not countenanced by the Pharmacopœia. The fluid ounce for which the symbol ℥ is used regularly, is the measure of 437½ grains of distilled water at the standard temperature and pressure. I consider, therefore, that when ℥j of a powder or any solid is ordered in a prescription, it is perfectly justifiable, in the absence of positive knowledge that the writer means the troy ounce, to dispense the avoirdupois ounce; it is, moreover, consistent, which is more than can be said for the use, in such a case, of the troy ounce.

I agree with Mr. Tanner and G. S. that the earlier the metric system is made official the sooner we shall be free from any anxiety with regard to the interpretation of signs.

P. B.

Glasgow, November 27, 1877.

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[21]. APOTHECARIES' OR AVOIRDUPOIS?—With regard to the above question, the compilers of the British Pharmcopœia, 1864, speak very plainly, and to my mind leave no room for doubt.

In the preface, page xviii, the following occurs:—"The council in resolving to adopt for pharmacy the imperial ounce and pound, could not assimilate the sub-division of the ounce to that of the fluid ounce, without substituting a new medical grain, hitherto the medical as well as the standard grain of the kingdom."

This alteration they did not consider advisable; it has therefore appeared to them a necessary consequence that the drachm and the scruple, the old denomination of weights "between the ounce and the grain of pharmacy, must be abandoned since they can no longer exist as both simple multiples of the latter and integral parts of the former; accordingly, all who prescribe and dispense medicines are strongly recommended to discontinue henceforth the use of the drachm and scruple weights."

In the B. P. 1867, the avoirdupois ounce is specially mentioned as "still retained in preference to troy weight of the same denomination."

From this I learn that the ounce adopted by the council is the avoirdupois ounce (437·5 grains), and should always be used, whether in dispensing or in the sale of medicines, there being no authority for the use of the troy ounce.

51, *Judd Street, W.C.* FELIX STEVENS.

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[21]. AVOIRDUPOIS *v.* APOTHECARIES'.—When first writing on this subject, I had no idea that the discussion would reach its present length; the interest in it, however, appears to be increasing rather than diminishing. I am always willing to learn from others and to respect the opinions of those who differ from me, but up to the present time I fail to gather from anything adduced a single reason which should cause me to alter my views.

It seems to me that appealing to the wishes of any one or half a dozen medical men helps the matter very little; what we must have is a principle to go on applicable alike in the small or large establishment, near and known to, or distant from and unknown to the prescriber; exercising judgment by all means, but in so doing leaving that principle unaltered.

The U. S. Pharmacopœia still retains troy weight and the old wine measure, whilst the buying and selling is done by avoirdupois weight; the result being that in any one drug store, three ounces, each possessing different values are still in use, viz. 480, 455·7, and 437·5 grains respectively.

Exactly the same state of things obtained in England at one time, but we have been freed from this yoke, and although all that could be desired has not yet been accomplished, every one will surely acknowledge that the abolition of the apothecaries' weight and the adoption of a single unit for both weight and measure in the British Pharmacopœia is a step in the right direction. The unit adopted was the grain recognized by law in this country possessing the same value as, but not a troy grain; and knowing how diffiult it is to eliminate from the minds of even enlightened men the impression placed there as the results of usage, the signs ℈ and ʒ are permitted (not recommended) as representing, or rather as a convenient mode of expressing, twenty and sixty grains avoirdupois not scruple and drachm as formerly; there was no necessity for mentioning the ounce in this part of the preface of the B. P., because a definite value is given to it elsewhere.

Many prescriptions have been quoted. I will just take the one as corrected by Mr. Wilkinson, and in the absence of any special instructions to the contrary should dispense it (or indeed any other prescription) with the weights and measures of the British Pharmacopœia.

				Avoirdupois.
℞.	Ol. Limonis . . .	gtt ij	=	♏ij.
	Sodæ Bibor. . . .	ʒij	=	grs. 120.
	Sacch. Alb. . . .	ʒiv	=	grs. 240.
	Potass. Bitart. . .	℥j	=	1 ounce.

To be mixed in a pint of water for a drink.

Then the dispenser compounds the prescription by avoirdupois weight and measure, the patient dissolves it in a pint or twenty avoirdupois ounces, and takes it by the same measure also. Why so far the metric system itself could scarcely furnish greater uniformity!

It might be objected that by weighing thus, I have introduced fractions of grains in the divided dose, say an ounce of the liquid. True, but this will occur any way. That quantity will contain essence of lemons one-tenth of a minim, borax six grains, sugar twelve grains, cream of tartar twenty-two grains practically; if the prescriber intended to give twenty-four grains in each ounce the fault rests with himself, not with the dispenser. It is quite possible, however, that no special dose would be intended at any one time. Many medical men do not under ordinary circumstances give special doses, but estimate the amount of any medicine that they are prescribing that the patient will bear or require in a given time, say twenty-four hours, and then order that quantity to be given in divided quantities, small and frequent, or larger and less frequent, according as they wish the effect to be constant or intermittent. At the worst the discrepancy would be less than eight per cent., whilst if the instructions of the prescription were implicitly followed, the difference in dispensing the oil of lemons at any two establishments might be fifty per cent.

In the case of the medical man quoted, who continues after ten years have elapsed to write P. L. 1851 at the head of his prescription, there is no ambiguity most assuredly; but had he spent one-fourth the time thus occupied in perusing the B. P., he would doubtless ere this have discontinued the practice, and have unhesitatingly acknowledged the superiority of the latter work.

CHARLES SYMES.

December, 1877.

[No 21]. If the present correspondence be in any way the means of bringing the metrical system into general use great good will be accomplished thereby.

G. S. in his remarks upon the following quotation from B. P.: "It is strongly urged upon all medical men to avoid the use of the terms ounce and pound with reference to any other than the avoirdupois or imperial standard weight," confounds the word terms with symbols which, I take it, has quite a different meaning. He should have quoted the whole of the sentence, which continues thus :—"but it will be optional with the physician, in prescribing, to use the symbols ℈ and ʒ, the former representing 20, and the latter 60 grs., if such should be found to conduce to accuracy or convenience."

Now the symbols ℈, ʒ, and ℥ have always been used in connection with troy and apothecaries' weight, but never with avoirdupois. I therefore venture to assert that we are fully entitled to, and justified in infering that if a physician uses the sign ℥ we are to interpret it as representing 480 grs. or ʒviij, and not 437·5 grs.

Further, if we reduce a mixture or powder, from, say the six or twelve doses as written for, to one dose, we shall find that 99 per cent. of such cases will give an equal number of grains per dose, to which the sign ℥ may be appended (reckoning 480 grs. to the ℥j).

From this, if from no other reason, the dispenser would be justified in using ℥j troy, and not 1 oz. avoirdupois. I would call Dr. Symes' attention to the fact that in the B. P. the sign or symbol ℥ is carefully abstained from and the word ounce always used.

G. S. is not to the point in his sample prescriptions, inasmuch as the question in dispute is the use of the symbol ℥ as regards solids, and not liquids. He "may be surprised to hear" that in sending out liquid medicines a dispenser does not disregard or ignore the troy system, as there is no troy measure to ignore.

Dr. Symes (Nov. 24) no doubt disposes of Mr. Mackay's seven reasons entirely to his own satisfaction, but hardly so, I imagine, to that of the majority of your readers. With regard to the prescription for ung. hyd. iodid. rubr., which he mentions, I should be rather inclined to think that the medical man meant an ointment with 4 grs. to the ʒj than one double the strength, B. P.

Looking at the, in many cases, odd and inexpressible proportion in parts (*i. e.*, 1 part active ingredient in so many parts of the bulk), may not the compilers of the B. P. have overlooked their preface, and reckoned according to the old, and to them more familiar, apothecaries' weight?

Medical men generally are in the habit of mentioning the strength of different preparations as being one in so and so, rather than so many grains to the oz.

Islington. A. LAITRAM.

[21]. TROY *versus* AVOIRDUPOIS.—Believing that the wishes of the prescriber should guide us in reference to the above, I have, during the last fortnight, taken the opportunity of inquiring from some of our best men here which weight was intended when the sign ℥ was written, and I find without exception all for troy, and in some cases they quite ridiculed the idea of any other being used. I fancy this will be found pretty general throughout the kingdom. J. ARBLASTER.

New Street, Birmingham.

[43]. "An Assistant" will find, that by slightly warming the pestle and mortar (or slab and spatula), he will be able to blend the ung. zinci and S.V.R. without any difficulty.

A. C. C.

BOOKS, PAMPHLETS, ETC., RECEIVED.

THE CHEMISTS AND DRUGGISTS' DIARY. 1878. London: 44a, Cannon Street.

The 'Chemists and Druggists' Diary' for the present year, which we learn from the Introduction is the tenth of the series, has been received, and we are glad to note that it presents no signs of falling off from the high standard of excellence attained by its predecessors. The value of the 'Diary' proper and skeleton pages has no doubt, in former years, been proved by our readers, and we feel sure that the "literary matter" in the present volume will be extremely serviceable. One feature in it is worth special notice, the "Dictionary of Synonyms," which numbers upwards of one thousand articles, and no doubt will be the means of removing many perplexities arising from the advent of unfamiliar names into different pharmacies.

HISTOIRE DES DROGUES D'ORIGINE VÉGÉTALE. Par F. A. FLUCKIGER et DANIEL HANBURY. Traduction de l'ouvrage anglaise 'Pharmacographia,' augmentée de très-nombreuses Notes, par le Dr. J. L. DE LANESSON. Avec une Préface par H. BAILLON et 320 figures. Paris: O. Doin. 1878. From the Translator and Publisher.

ELEMENTS OF DENTAL MATERIA MEDICA and THERAPEUTICS WITH PHARMACOPŒIA. By JAMES STOCKEN, L.D.S., etc. London: J. and A. Churchill. 1877. From the Author.

ELEMENTS OF THERAPEUTICS. A Clinical Guide to the Action of Medicines. By Dr. C. BINZ. Translated from the Fifth German Edition by EDWARD J. SPARKS, M.B., Oxon., etc. London: J. and A. Churchill. 1877. From the Publishers.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

AN EXPLANATION.

Sir,—Judging from the fact that my name has appeared with unenviable prominence in the advertisement columns of the Journal, I am led to suppose that there has been some dispute between Messrs. Muter and Wills as to whom should be the credit, or otherwise, of having coached me for the Major. Will you, therefore, allow me space in the Journal to give a plain statement of the facts of the case, which I hope will effectually put a stop to a most unwarrantable use of my name?

Towards the end of 1876, I commenced to study privately for the Major examination, being then and up to the date of passing it, senior in a London business, and feeling the want of some help in the matter, amongst other things I applied to Mr. Wills for his postal lectures. The result was that I paid him a guinea for two lectures a week; but when I came to look into them and the sequence between them I found that they were not in any way suited to my purpose, so transferred them to a friend who believed he could derive some benefit from their perusal. The lectures were, I believe, not half finished when I received my certificate. During the time I was studying, having a fortnightly day off duty, and wishing to employ it usefully, I entered into an arrangement with Dr. Muter, who allowed me to spend that day in practical analysis with the Major students at laboratory, this being towards the end of my studies. I spent, I believe, not more than two or three days in this manner, and to that extent only may I be considered his pupil.

In conclusion, I may add that absence from England prevented my sooner making this explanation.

A. H. BALDWIN, PH.C.

Byculla, Bombay, November 11, 1877.

G. Lines.—The first specimen sent was a fragment of a *Juniper*, but the materials were not sufficient for the determination of the species. The second is *Teucrium Scorodosma*, used by herbalists in the treatment of dyspepsia.

H. A.—We presume the Inland Revenue authorities would not interfere if the spirit were obviously used for medical purposes; but see p. 466.

W. D. W.—We do not think that any good purpose will be served by the publication of your question. Previous experience has shown, as might be expected, that opinions expressed from different localities have been very diverse.

B. T. Kimber.—The mistake may have been made either by the witness or by the reporter of the newspaper from which the report was quoted; it would not do always to alter reports of evidence in accordance with our ideas of correctness. We do not think the danger you hint at is very great.

"*Occidens.*"—Your mosses are—(1) *Dicranum majus*; (3) *Tortula tortuosa*; (4) *Hypnum cupressiforme*; (5) *Tortula recurvifolia*, mixed with *Tortula vincalis*; (6) *Hypnum Schreberi*. No. 2 is a scale moss, *Scapania undulata*.

"*Student.*"—"Pharaoh's Serpents" consist of sulphocyanide of mercury made up into the form of a cone and covered with tin foil. Full information respecting them will be found in *Pharm. Journ.*, 2nd ser., vol. vii., pp. 152, 316, and 581.

"*Spondalium.*"—Squire's form for Liquor Chloroformi Camphoratus is:—Camphor, 1; Chloroform, 2; dissolve.

"*Inquirer.*"—Gum Kauri occurs in commerce, and is an exudation from the *Dammara australis*. See vol. v., p. 259.

W. G. Smith.—"Bird lime" is prepared from the middle bark of the holly, gathered in June or July, by boiling it for six or eight hours in water until tender, allowing the wet mass to undergo fermentation for two or three weeks, and then rubbing up the mucilaginous product in a mortar to a uniform paste, which is washed with water to remove refuse matter.

J. B. C.—The word "Ireland" does not appear in the Act. We are making inquiries and will let you know the result.

"*Bellum.*"—See the Journal for June 23 last, p. 1041.

"*Associate.*"—There is nothing in the Pharmacy Act to prevent such a course being taken, but, of course, the owner of the establishment would be held responsible for any consequences that might follow.

F. W. Parris.—We believe the publishing price of Mrs. Gatty's work on 'Seaweeds,' which would perhaps suit your purpose, is about 30*s*.

A. Reynor.—Yes; for the process see Watt's 'Dictionary,' vol. i., p. 691.

J. Young.—Faraday's 'Chemical Manipulation' is published by Mr. Murray.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Dowman, Mr. Crispe, Mr. Sutton, Mr. Barlow, Mr. Haffenden, Mr. Cock, Mr. Howie, Mr. Roberts.

PHYSIC MASS AND BALLS.

BY ELLIMAN, SONS AND CO.

In July 1875, with a view to the introduction of a physic ball as a *spécialité*, we made a number of experiments on physic mass. We were desirous of finding a mass which should have the following properties:—

First.—Contain a large proportion of aloes.

Secondly.—Which though firm should yet be plastic and ductile.

Thirdly.—Which should be readily dissolved in the horse's stomach.

Fourthly.—Which would keep, retaining its plasticity, ductility, and solubility, for any length of time, and could be made into balls with ease, being worked cold.

Fifthly.—That when made into balls, the balls would not lose shape or fall.

We searched in vain for a formula giving a product which would fulfil these requirements. The formulæ given by Morton and others produce a ball falling far short of this ideal, as those who have had experience with physic mass well know.

Glycerine soon proved to be the best solvent of aloes, and made a mass both plastic and ductile, but so hygroscopic that it was perfectly useless, especially in an English climate. We then thought—was it possible whilst retaining the glycerine as a solvent for the aloes, to combat the tendency of the mass to absorb moisture?

We found that by using less glycerine and adding castor oil, the hygroscopic nature of the product was so much lessened that the mass approached the ideal standard. We will briefly give the formula and *modus operandi* which we found most successful.

Take of

Best Barbadoes Aloes	10 lbs.
Glycerine	1 lb.
Castor Oil	1 lb.
Powdered Unbleached Ginger	$\frac{1}{2}$ lb.

Dissolve the aloes in the glycerine by means of a water-bath, then add the castor oil, and lastly stir in the ginger previously resifted through a coarse sieve. When operating upon 50 pounds of aloes we have found that it would dissolve in five pounds of glycerine in about one and a-half hours, so that the mass of over 60 pounds could be made in a little more than two hours.

The mass possessed the first four properties we were seeking.

It contained a large proportion of aloes, the aloes forming nearly $\frac{5}{6}$ of the mass. It was firm, plastic, and ductile. It was readily dissolved in the horse's stomach. It would retain these properties for any length of time, and could be readily made into balls, being worked cold. But our fifth requirement was not satisfied; when made into balls they would not retain their cylindrical form: like pitch they fell.

Could this tendency of the balls to fall be in any way removed? Not in any way that we could discover except at the expense of the other necessary qualities of the mass. It was therefore requisite to give the balls a support, and for this purpose we had white cardboard boxes made of the same shape as marking-ink cases. Into these the balls, wrapped in waxed paper, were placed as soon as made.

Division of the mass into balls.—If a *specialtié* prove a success, not many dozens but many grosses are sold daily; it was therefore necessary to devise a method by which the mass could be very rapidly divided into balls; for the ordinary process of weighing each one separately, and rounding with the hand is slow and tedious. The following is the method we employed for the division into balls:—

The plate of a 7lb. Pindar's piping press is perforated with six holes, $\frac{3}{4}$-inch in diameter, placed hexagon fashion. The press being filled with the ductile mass, pressure is applied; pipes of mass are produced which when from 8 to 10 inches in length are rapidly cut off, placed on a table, and rolled all six together with a weighted board to remove unevenness in them. No powder is required to prevent adhesion of the pipes. The pipes are then placed into semicylindrical zinc gutters to prevent falling, till their turn arrives to be cut up.

For cutting up a number of knife edges are fixed at equal distances in a board. The pipe is placed on these knife edges and rolled gently backwards and forwards by means of a light board, very gentle pressure being applied. The balls are immediately placed in other zinc gutters till their turn arrives to be wrapped in waxed paper and placed in boxes.

By this method a man and boy can make, wrap, and place in boxes, over a gross an hour.

No scales are used; the boxes being made to contain a certain volume of mass. If the balls are too large they will not go into the boxes, if too small they fit loosely; but with a little practice the pipes can be cut with ease into balls which have very nearly the same weight and which accurately fit the boxes.

For balls of different strengths, pipes of the same diameter are cut into balls of different lengths, and of course placed into boxes of same diameter but of different lengths. A separate cutter is therefore required for each strength ball, but balls containing 4, 5 and 6 drachms of aloes are sufficient for all ordinary purposes.

This mass shares with all other ductile masses the property of falling, but the boxes add very little to the cost of the balls and enable them to retain a perfectly cylindrical form, which is a step in the direction of elegant veterinary pharmacy.

A NEW PROCESS FOR MAKING PHOSPHATE SYRUPS.

BY JOHN LAURIE.

So much has already been published upon the production of these syrups, that the writer feels a delicacy in again introducing the subject; but the fact that by no published formula can a satisfactory product be obtained is his apology, and he therefore wishes to bring under the notice of pharmacists a process which in his hands has been eminently successful.

In the following formula the method adopted for the production of the ferrous phosphate is that proposed by Mr. Borland.*

The author is not aware that the process employed by him for obtaining the calcic phosphate has before been applied to the manufacture of these syrups; he proposes it as an easy way of obtaining a pure tricalcic phosphate, the varying composition of the commercial phosphates of lime being in his opinion a very frequent cause of the precipitates which have been found so troublesome; besides, the ordinary

* *Pharm. Journ.* Sept. 30, 1876, p. 280; Trans. Brit. Pharm. Conf., 1876, p. 593.

phosphate of lime, as is well-known, always contains a large percentage of water, hence the finished syrup is frequently deficient in the lime constituent.

The strength adopted for Parrish's syrup, viz., half a grain ferrous phosphate and two grains calcic phosphate in the fluid drachm, is the same as would result in making a syrup from Parrish's published formula; and agrees with the best commercial samples of syrup, as shown by Mr. Howie (*Pharm. Journ.*, 3rd series, vol. 6, p. 808).

A syrup of the full strength stated on the labels of "Parrish's Chemical Food" may easily be obtained by the process now described, but the large quantity of acid necessary to dissolve and retain the phosphates in solution renders the syrup disagreeably acid.

A saccharated solution of lime is prepared by shaking together during several hours—

Freshly Slaked Lime	8 ounces
Refined Sugar, in powder . .	16 ounces
Water	40 ounces

The clear solution is estimated volumetrically for hydrate of lime, and will be found a little over four times the strength of the similar solution of the British Pharmacopœia.

Parrish's Chemical Food.

Take of

Saccharated Sol. of Lime, sufficient to yield	670 grains hydrate of lime
Sulphate of Iron, pure . . .	448 grains
Phosphoric Acid, sp. gr. 1·75 .	3 fluid ounces, or q. s.
Carbonate of Soda, crystallized	50 grains
Carbonate of Potash	75 grains
Cochineal, in fine powder . .	2 drachms
Orange Flower Water . . .	1½ fluid ounces
Refined Sugar, coarsely powdered	30 ounces
Distilled Water q. s.	

Dilute the solution of lime with distilled water to a pint, put into a quart bottle, gradually add the phosphoric acid, frequently shaking, till the precipitate is dissolved, then carefully add the carbonates dissolved in one ounce of distilled water, shake till clear, then add the orange flower water and enough distilled water to make the whole measure 32 fluid ounces; to 26 fluid ounces of this solution add the cochineal, digest for several hours, and filter into the sugar; shake occasionally till dissolved.

Put the sulphate of iron, with the rest of the phosphate solution, into a bottle of about seven fluid ounces capacity; cork tightly, shake occasionally for half an hour, squeeze strongly through moistened calico, and mix the clear liquor with the syrup; the product measures 48 fluid ounces.

It is necessary strictly to follow the direction of first dissolving the sugar in a portion of the phosphate of lime solution, and afterwards adding the ferrous phosphate; if an attempt be made to dissolve the sugar in the mixed lime and iron solutions a precipitate of iron salt will certainly result—

Syrupus Ferri Phosphatis, B.P.

Take of

Saccharated Sol. of Lime, sufficient to yield	120 grains hydrate of lime
Sulphate of Iron, pure . . .	448 grains
Phosphoric Acid, sp. gr. 1·75 .	10½ fluid drachms
Refined Sugar, coarsely powdered	17 ounces
Distilled Water, q.s.	

Dissolve the sugar in eight fluid ounces of distilled water with the aid of heat; prepare a solution of ferrous phosphate, as above directed (diluting the solution of phosphate of lime to five fluid ounces before adding the sulphate of iron), add this to the syrup, and enough distilled water to make the whole measure 24 fluid ounces.

This syrup will contain approximately the same quantity of acid as the Pharmacopœia syrup, but six fluid drachms of acid, sp. gr. 1·75, will be found amply sufficient to dissolve and retain the iron; the formation of precipitates in these syrups not being retarded by a large excess of acid.

A larger proportion of the carbonates of soda and potash added to "chemical food," will make the syrup less acid—or phosphate of soda may be substituted for the same purpose.

Syrups prepared according to the process just described will contain, as an impurity, a trace of sulphate of lime, and, in the case of the Pharmacopœia syrup, of phosphate of lime also, but the very small quantities present can hardly be considered an objection.

Samples of "chemical food," Syr. Ferri Phosph., B.P., and Syr. Ferri Phosph. c. Strychnia, prepared as above, have been kept for six months without undergoing any visible change. All are entirely free from deposit. The chemical food has been kept in a Winchester quart three-fourths filled, the other two in stoppered bottles, full, and exposed to strong light.

SYRUPUS FERRI PHOSPHATIS C. QUINIA ET STRYCHNIA.

BY GEORGE MASSON.

Having to prepare some Easton's syrup, the attention of the writer was arrested by the variation exhibited by the different formulæ. It was found that three methods for the preparation of this syrup had been proposed, each varying alike in the process employed, and in the strength of the finished product.

First may be mentioned the formula of Mr. M. Carteighe,* which directs dried phosphate of iron to be mixed with a small quantity of water and dissolved in syrupy phosphoric acid, to which has been added an appropriate quantity of strychnia and quiniæ phosph., the whole being finally mixed with syrupus B.P. Each fluid drachm of this preparation contains two grains phosphate of iron. This form offers some advantages with regard to facility of preparation, but is open to the serious objection, that dried ferrous phosphate has always undergone oxidation, the amount varying with the age of the sample and the care exercised in manufacture and storage.

The second process was suggested by Mr. E. C. Saunders,† and is an adaptation of the method originally introduced by Mr. H. W. Jones,‡ a modification of which was published by Mr. W. L. Howie,§ in his excellent and exhaustive paper on phosphate syrups. Prepared thus, the ferrous phosphate is formed by direct combination, metallic iron being employed and syrupy phosphoric acid; certain precautions being observed to prevent atmospheric contact, both during and after solution. For obtaining a syrup tolerably free from ferric contamination this is doubtless superior to the ordinary method of dissolving the precipitated phosphate.

* *Pharm. Journ.*, March 25, 1871.
† *Pharm. Journ.*, July 15, 1876.
‡ *Pharm. Journ.*, 3rd series, vol. 5, page 541.
§ *Pharm. Journ.*, April 8th, 1876.

Leaving aside, however, the question as to whether the product is identical with that formed by the action of sodic phosphate or ferrous sulphate, the process is rather a tedious one, and moreover the use of syrupy phosphoric acid is objectionable, unless care be first taken to ascertain its purity. Should the acid employed happen to contain the smallest proportion of either pyrophosphoric acid, $H_4P_2O_7$, or metaphosphoric acid, HPO_3, the result is a most unstable syrup, which causes considerable trouble. This preparation contains one grain phosphate of iron in the fluid drachm.

The third process is given in Squire's 'Companion' to the B. P. (10th edition). In its details the *modus operandi* is very similar to that described in the latter work for syr. ferri phosph., and it is probably the form most generally employed. Here ferri sulph. 2½ ounces and sodæ phosph. 3 ounces are directed to be dissolved in a sufficiency of water, the solutions mixed, the precipitated ferrous phosphate collected, washed, and finally dissolved in 56 ounces acid. phosph. dil., together with quiniæ sulphas 1½ ounces and forty-eight grains, and strychnia twenty-four grains; this mixture to be added to 56 ounces of sugar so as to produce 96 fluid ounces of syrup. Being doubtful whether the above weights were the troy or avoirdupois a calculation was made on the quantity of quinine, which converted into grains gave 768 grains troy and 704 grains avoirdupois; it was, therefore, concluded that the former was intended, although this fact is nowhere stated. Were the avoirdupois weights employed it would further impoverish a formula already deficient in active ingredient. A very little further consideration soon makes it apparent that even when troy weights are used the quantities ordered are insufficient to form a syrup containing as stated 1 grain phosphate of iron and 1 grain phosphate of quinia in the fluid drachm. For instance, 2½ ounces (troy) ferri sulph. is only capable of yielding on decomposition 515 grains $Fe''_3P_2O_8$; hence each drachm of syrup could only contain 0·670 grain phosphate of iron. This is assuming that complete decomposition really took place; such, however is not the case for, according to the researches of Mr. R. Price,* a loss through imperfect precipitation of no less than 28·2 per cent. occurs in the nearly identical process for syr. ferri phosph., B. P. Taking it for granted that there would be a corresponding loss it is evident that the proportion of ferrous phosphate would suffer a very serious further diminution. A deficiency also occurs in the quinine, no allowance having been made for the loss of weight consequent upon conversion of the sulphate into phosphate, the quantity ordered being capable of producing a syrup containing only 0·891 grain of quinic phosphate $(C_{20}H_{24}N_2O_2)_3 2H_3PO_4$ per fluid drachm.

The following is the formula I would propose; by it a colourless syrup may be readily obtained of full strength and possessed of good keeping qualities. The syrup should be preserved from the air in bottles, well filled, and securely stoppered:

℞ Strychniæ . . .		24 grs.	
Quiniæ Sulph. .		860 ,,	
Ferri Sulph. . .	4 ozs.	40 ,,	Avoirdupois.
Sodæ Phosph. . .	12 ,,		
Sacchari Purif. Contus. . .	60 ,,		
Acid. Phosph. Dil.	48 ,,		

* *Pharm. Journ.*, March 4, 1876.

Dissolve the quiniæ sulph. in aq. dest., with a sufficiency of acid. sulph. dil., precipitate with liq. ammon. q.s., collect on a filter, wash carefully, avoiding the use of too much water, and add to the acid. phosph. dil. in which the strychnia has been previously dissolved. Dissolve the ferri sulph. in Oij, and the sodæ phosph. in Ov of recently boiled distilled water, filter the iron solution if necessary to remove any oxidation, allow the solutions to cool to 130 F., and then add very gradually with constant stirring the solution of soda to the iron; allow the precipitate to subside, remove the supernatant fluid and wash the ferrous phosphate by decantation with recently boiled distilled water, then transfer to a calico filter, express quickly the remaining liquid and dissolve in the dilute phosphoric acid; finally add the sugar, dissolve without heat and subsequently add a sufficiency of distilled water to make the product measure ninety-six fluid ounces, each fluid drachm of which will contain one grain phosphate of iron, one grain phosphate of quinia and $\frac{1}{32}$ of a grain of strychnia.

NOTES ON INDIAN DRUGS.

BY W. DYMOCK.

(*Continued from page* 386.)

HYSSOPUS, Sp. ?—*Local name*, ZOOFAI YABIS.

From an examination of the drug this appears to be a small plant 6—8 inches high; stem not thicker than a crow quill, 4-angled, purplish, branched from the base, which is woody; root woody, seldom branched; flower heads numerous, oblong; calyx striated, hairy, purple, with five sharp teeth; seeds naked, four in number, oblong, 3-angled, of a pale brown, studded with rows of small round tubercles; on one side of the hilum there is a fringe of smaller tubercles very closely set, and on the other two elongated white prominences. In the drug the plant is much broken up; it has a pleasant odour like sweet hay; there are no leaves to be seen. Taste bitter; properties, stimulant, anthelmintic and deobstruent. This drug has often been attributed to *Hyssopus officinalis*, but this cannot be correct, as the flowers are in oblong spikes. It is imported from Persia.

——— ?—*Local name*, BADRUNJBOYA.

Calyx striated, hairy, 5-fid; not so long as that of Zoofai Yabis, and not coloured; seeds four, naked, brown, 3-angled, nearly smooth, a white patch on each side of the hilum; flowers in axillary clusters of about six, upon a short peduncle; leaves ovate, margin deeply dentate, somewhat hairy. The drug is always much broken, and consists chiefly of stem and fruit; the former is quadrangular, much larger than that of zoofai, of a purplish tint. Taste bitter, odour faintly aromatic; properties stimulant and deobstruent. Imported from Persia. By some attributed to *Napeta ruderalis*, but I do not know upon what authority.

CUSCUTA Sp. ?—*Local name*, KASUS.

What is sold in the shops is a species of cuscuta, and is mixed with the small oblong leaves and spines of the plant upon which it has grown; most of it is in seed, but the flowers are also present. The seeds are four in number, light brown, convex on one side, concave on the other, enclosed in a round capsule; taste bitter. Imported from Persia. Sometimes called Tukm i Kasus.

Cuscuta Sp. ?—*Local name*, Afteemun.

Also a dodder, but a rather larger plant than the last; the fruit and seeds are nearly double the size. Taste bitter. Imported from Persia. This article is described in Arabic and Persian works as the afteemun of the Greeks, which had so great a reputation in melancholy madness; it is still a medicine of importance with the Hakeems of India, who follow in the footsteps of Jalenus (Galen).

Cuscuta reflexa.—*Local name*, Akasweli.

Another of the dodders, very common in India upon bushes; it bears small white bell-shaped flowers, and is used for the same purposes as afteemun.

Picrorrhiza Kurroa.—*Local names*, Kutki *and* Kurroo.

The drug consists of a rhizome, generally about the size of a goose quill, but often no larger than a crow quill, the lower portion of which is covered by a shrivelled greyish-brown corky bark, and marked by prominent scars, the remains of rootlets; towards the upper end it becomes larger ($\frac{1}{4}$ inch in diameter) and is thickly set with dark greyish-brown scales, and terminates in a scaly leaf bud or stem. The rhizome is generally broken into short pieces, from 1—2 inches long; the fracture is short, the root very fragile and light, and black internally; it has no odour, and a very bitter taste. Examined under the microscope the corky bark is seen to be made up of numerous rows of empty brick-shaped cells; within this is a cellular parenchyma of oblong brown cells containing a little granular matter; next a dark brown line composed of wood cells, forming the boundary of the inner column of the root; within this several very large bundles of dotted cells arranged so as to form a broken ring, which surrounds a central cellular parenchyma. Kutki has been found to be a valuable tonic in doses of from 10—20 grains three times a day; it has also been used in larger doses as an antiperiodic. It has little or no purgative action. It has been sometimes confounded with black hellebore, owing to the name kali kutki being given in books as the Hindee for kharbuk aswad, the Arabic name of that drug. Ainslie remarks of kutki that it is not at all like black hellebore. Picrorrhiza grows in Gosainkhan, Kumaon and Cashmere; it is described as having sessile deep blue flowers in dense spikes (*vide* Royle's Illust.). It is noticed in the Pharmacopœia of India and its Supplement, and seems worthy of a further trial.

Echium Sp. ?—*Local names: The herb*, Gaozaban; *The flowers*, Gul i Gaozaban.

Gaozaban consists of the leaves more or less broken and mixed with pieces of stem; it cannot be mistaken for any other drug as the leaf is remarkably thick, and studded on both sides with large white calcareous glands, from which simple calcareous hairs one-eighth of an inch long arise; the latter generally get broken off, but where protection from friction has been afforded by a bend in the leaf the perfect gland and hair will be found. When fresh the dried leaves are of a greyish-green colour, and have a rather pleasant tea-like odour; the taste is mucilaginous and saline; placed in water they give out a large quantity of mucilage. Mr. Moodeen Sheriff has raised the plant from seed, but as it did not blossom he was unable to determine the species. Gul i gaozaban are of a deep blue colour, 1—1$\frac{1}{4}$ inches long, tubular, with a wide mouth, and have the same tea-like odour as the leaves. The calyx is 5-partite and thickly set with calcareous hairs; stamens 5, attached to the corolla; the bulk of the drug is deprived of the calyx. If long kept it loses its deep blue colour and turns reddish. Both drugs are imported from Persia; they are much used in native practice, especially for bilious affections. Their properties are described in the Pharmacopœia of India.

Withania coagulans.—*Local name of fruit*, Kaknuj.

A description of the plant and its uses will be found in the Pharmacopœia of India. The fruit is sold in the Bombay shops; it is about the size, shape, and colour of a dried cherry; skin smooth and shining, reddish-brown, much shrivelled. It contains a large number of flattened reniform seeds of a light reddish-brown colour, and about one-eighth of an inch long; these are sticky, from the presence of a small quantity of brown pulp; the testa is reticulated. Kaknuj has a fruity odour and hardly any taste.

Valeriana Hardwickii ?—*Local name*, Tugger gauthoda.

This valerian has crooked roots about two inches long, and from a quarter to half an inch in diameter, of a dull brown colour, marked with transverse ridges, and thickly studded with circular prominent tubercles, to a few of which thick rootlets still remain attached. The crown of the root is marked by a number of bracts; the lower end is blunt; the root is very hard and tough, and the fractured surface greenish-brown. Odour like valerian but much more powerful. Examined under the microscope the outer bark is seen to be composed of ten or twelve layers of compressed cells; within this is a starchy parenchyma, and next to it a cambium layer; within the cambium layer is a broken ring of vascular bundles, and lastly, a starchy parenchyma thickly studded with conglomerate masses of large cells, having greenish-yellow contents of a resinous appearance. The drug is mostly used in Bombay as a perfume, but there can be little doubt that it would prove an efficient substitute for valerian.

Labiatæ, Gen. ? Sp. ?—*Local name*, Mishk-i-Trayamana.

Imported from Persia. It is a very small plant, two to three inches high; root as long as the plant, single, woody, with a few small fibres. The stems, which are two to five in number, are also woody, and branch from the ground; they are thickly set with leaves and flowers which reach to the apex and form a spike. The leaves are linear-lanceolate and have several prominent straight veins on each side of the midrib. The calyx, which is purple, encloses four oblong seeds of a brown colour, and is marked with numerous ribs, and ends in five sharply cut claws; it is studded with simple hairs, and is three-tenths of an inch long. The odour and taste of the drug is pleasant, like peppermint, but sweeter. Properties stimulant and carminative.

GRISLEA TOMENTOSA.—*Local name*, DHAITEE OR DHAWREE.

This shrub is common in Khandesh, also along the Ghauts, and in the Concon. The flowers and their calices are red; the latter are permanent and retain their colour after the flower has faded. As met with in commerce the calices generally contain the nearly mature capsule, which is two-celled and two-valved, and completely enclosed. The seeds are light brown, very minute, oblong, and very numerous. The calyx is twelve-toothed. In ordinary samples of dhaitee some of the flowers are in small racemes, and a good many lanceolate leaves, with a whitish under-surface studded with black dots, are mixed with them. The enlarged calices are very astringent and contain much tannin. They are used medicinally by the natives; commercially they are of considerable importance, being used in dyeing and tanning.

(*To be continued.*)

THE NASCENT STATE AS AFFECTING CHEMICAL ACTION.*

BY EDWARD DAVIES, F.C.S.

The discovery that at the moment of being set free from one state of combination, elements and compounds have a more powerful chemical action than in their free state, is one which has placed in the hands of chemists a means of effecting decompositions and producing new compounds, which has already yielded most valuable results, and bids fair in the future to be second to none in the inroads which it will enable us to make on the regions of the unknown. As any help to research must be valuable to those who desire to extend the domain of knowledge, I feel sure of a favourable reception for my endeavour to collect the facts and theories which, so far as I know, have hitherto been scattered as isolated items in chemical works, and to set them out in a connected form.

I must first ask careful attention to the theory relating to the state in which elements exist when free—that is, when uncombined with any other elements. The atomic theory has of late years been the subject of attack, but as I am unable to imagine any rational explanations of the nascent state without admitting that theory, I shall assume its truth. Shortly it is that all elements are composed of almost inconceivably small particles, which are incapable of further division by chemical means, and are the smallest particles which exist in compounds, so that, for example, if the smallest possble portion of hydrochloric acid were to be the subject of further division, the result would be one atom of hydrogen and one of chlorine. Of late years there has been added to this theory, that of molecules of elements as well as compounds, which is that an atom of at least most of the elements cannot exist for any appreciable time free and uncombined, and that when set free from a combination, in default of any atom of another kind, it will combine with another atom of the same element; for example, H will unite with H to form H_2, O with O to form O_2. The smallest particles of many of the elements existing in the free state will therefore be two atoms; this is the case with H, O, N, Cl, Br, I, F, S, Se, Fe; the monad metals P and As, and probably Sb and Bi, have four atoms in the molecule, while Hg and Zn, and probably many of the dyad metals have only one, their two combining powers uniting in a sort of self saturation.

That this view has much to recommend it is clear when we consider that all gases, simple and compound, expand alike for equal increments of heat. Now the molecules of compound gases and vapours all occupy equal spaces, and the action of heat consists in causing the molecules to recede to a greater distance and so occupy greater spaces. As equal effects are produced by heat on compound and simple gases, the probability is that as the compound bodies acted on are molecules, so the simple bodies are also in the state of molecules. Also, suppose two equal vessels, one containing 1000 atoms of Cl and the other 1000 atoms of H; a certain pressure will be exerted on the sides of each vessel. Now suppose these two vessels brought together, and the gases combined to form HCl, of which there will be 1000 molecules, 500 in each vessel; the pressure will be unaltered, although there are now 500 molecules in each vessel instead of 1000 atoms, whence we conclude that the 1000 atoms of H were combined in twos, so as to make 500 molecules, and that the same was the case with the 1000 atoms of Cl. Another proof is shown in the tendency of O to unite with O in the action of hydroxyl, H_2O_2 on Ag_2O. Both bodies lose O, and the simplest way of explaining this is, that one atom of oxygen in the hydroxyl unites with the atom of oxygen in the oxide of silver, both being loosely united, to form a molecule of oxygen, or O_2 leaving water and metallic silver, $H_2O_2 + Ag_2O = H_2O + Ag_2 + O_2$.

The bearing of this on our present subject is, that we can well conceive that if we could get an atom to act chemically before it had united itself to another atom of the same kind, it would act more powerfully than it would do if it had to be torn away from combination with another atom. The union of H with H must present some amount of resistance to be overcome before the hydrogen can be united with something else, whilst if we can present the hydrogen atom not yet united, this resistance will not exist and the union of the hydrogen with oxygen, for example, much facilitated.

This condition we realize in the various reactions which depend on the application of the nascent state, and as a matter of fact elements can thus be made to exert a power which is totally absent from them when they are fairly set free. Of course the element or compound which is to act in the nascent state, must be formed in the solution containing the body so acted on, or be in actual contact with it, for the slightest appreciable distance would give the opportunity for the union of atom with atom, and the element or compound would then be in the free, and not in the nascent state. Examples of the action of elements in the nascent state may now be mentioned. Reduction of oxygenated bodies by nascent hydrogen gives some of the most striking examples: free hydrogen may be passed through a solution of a nitrate for any length of time without formation of water by union of the oxygen of the nitrate, or of ammonia by the union of hydrogen with nitrogen. If, however, the hydrogen be nascent, both of these actions will take place, and an analytical method for the determination of small quantities of nitrates has been founded on this. Again, free hydrogen is without action on ferric sulphate, but if nascent hydrogen be used the salt is soon brought to the ferrous state.

Sulphurous acid, by the action of nascent hydrogen, loses its oxygen, and the sulphur unites with the hydrogen to form H_2S.

Direct combination of hydrogen with bodies, both organic and inorganic. Aldehyde can thus be brought back to the original alcohol. Nascent hydrogen will form H_2S with precipitated sulphur, and remarkably in the case of the action on insoluble sulphides, such as PbS and CuS, will even remove it from the state of combination. It exerts both the actions spoken of when it acts on As_2O_3, first removing the oxygen and reducing the arsenic to the elementary condition, and then uniting with the arsenic, also nascent to form AsH_3.

Nascent hydrogen is produced in various ways, amongst which may be named the action of H_2SO_4 or HCl on zinc, sodium, amalgam, or zinc amalgam, the copper zinc couple, and the action of alkalies on zinc, aluminum, or iron.

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* Read at the evening meeting of the Liverpool Chemists' Association, held October 27, 1877.

Oxidation.—By means of bichromate of potassium, peroxide of manganese, or permanganate of potassium, and sulphuric acid, nascent oxygen can be produced and reactions obtained, impossible, or at least difficult, for free oxygen.

Alcohol is thus transformed into aldehyde, and acetic acid; and amyl alcohol into valerianic acid. Of reactions, which are slow when free oxygen is used, but immediate with nascent oxygen, the oxidation of ferrous salts may furnish an example.

Oxidation is also brought about indirectly by the action of chlorine. For example, in bleaching we find that dry chlorine produces no effect, water must be present, and the destruction of the colour is really due to the combination of chlorine with the hydrogen of water, and the evolution of nascent oxygen. Nickel hydrate is not affected by free oxygen, but if chlorine be passed into a strongly alkaline solution in which the hydrate is suspended, sesquioxide of nickel is formed.

The oxidizing action of peroxide of hydrogen is explained when we remember the readiness, with which it decomposes into water and nascent oxygen. Also, ozone, which contains three atoms of oxygen in the molecule, is more powerful than ordinary oxygen, because of its tendency to form the ordinary molecule of two atoms, and set free an atom in the nascent state. That this is so is shown by the fact that in oxidation by ozone only one third of the oxygen acts, the other two thirds remaining as ordinary oxygen.

Chlorine also acts more powerfully in the nascent state. Thus in aqua regia we have a powerful solvent of metals owing to the formation of nascent chlorine.

Substitution in organic compounds is also, in my opinion, largely due to the action of elements in the nascent state. Each stage in a substitution requires a molecule of, say, chlorine or Cl_2. Take CH_4: the first step is to form HCl by the affinity of H for Cl. The other atom of Cl is thus rendered nascent, and immediately unites with the residue CH_3. This is repeated until four molecules of chlorine have been employed, and, as a final result, CCl_4 is produced, although free chlorine is absolutely without action on free carbon. A similar action takes place in the case of iodide of nitrogen. A molecule of iodine or I_2 acts with formation of HI and NH_2I. Three molecules act thus until NI_3 remains, although nitrogen and iodine have such a slight affinity that the disturbance produced by the touch of a feather is sufficient to cause their separation.

Another chemical action in which the effects of the nascent state may be traced is double decomposition. Here, from two compounds, one new one is formed, probably from a more powerful attraction existing between the basylous radical of the one and the acidulous radical of the other than between the basylous and acidulous radicals of either of the original compounds, or because an insoluble or a volatile compound can be formed. The formation of one new compound leaves the other radicals in the nascent state and thus favours their combination. Thus we can form the sulphides of gold and platinum easily, although free sulphur and gold or platinum have little power of combining, by adding H_2S to their chlorides, where the attraction of hydrogen for chlorine leaves gold or platinum and sulphur in the nascent state.

The nascent state of compounds has not excited so much attention as that of elements, but we may in this fact get the explanation of many analytical difficulties and some analytical processes.

The simple method of estimating tin in alloys by acting on the alloy with nitric acid and filtering off the stannic hydrate is rendered inaccurate by the tendency of the nascent stannic hydrate to combine with CuO, and especially with Fe_2O_3. The former metal appears to be almost entirely removed by evaporation almost to dryness with excess of nitric acid and re-treating with dilute nitric acid, but Fe_2O_3 cannot be thus removed. Chromic hydrate is precipitated by cold caustic potash, and is freely soluble in excess, but in presence of excess of ferric hydrate not a trace is dissolved, and methods of qualitative analysis founded on this reaction are useless. Chromic hydrate and zinc hydrate are also retained, but not so completely, by ferric hydrate in the nascent state. Perhaps in nothing is this so remarkable as in the formation of those compounds of saturated molecules with one another which are the puzzle of theoretical chemistry to represent in graphic formulæ, such as have $PlCl_4 2KCl$ for a type. These bodies are generally double salts, and it is to the influence of the nascent state in forming these that we may trace some of the difficulties of analysis. Such are the carrying down of ZnS by CuS in acid solutions, and of oxalate of magnesia by oxalate of lime when neither zinc nor magnesia would have been precipitated but for the other metals.

A case in which this tendency of compound bodies to unite with others when in the nascent state is utilized for analytical purposes is the separation of phosphoric acid from nitric acid solutions by means of tin. Here stannic hydrate is formed, and at the moment of its formation it combines with phosphoric acid, completely removing it from the solution. I have tried a variation of this process, in which the stannic hydrate was precipitated from solution by adding $SnCl_4$ to the acid solution of phosphates, and boiling with sodium sulphate, but the co-precipitation of ferric oxide was so complete that the object was entirely defeated.

The principal applications of the nascent state have been in scientific chemistry, but there are many practical processes depending on it. Nitrobenzene is reduced and hydrogen substituted for oxygen by means of nascent hydrogen, and aniline is obtained, the starting point for the brilliant and lovely tints derived from coal tar.

The application of chlorine as an indirect oxidizer has rendered bleaching an affair of hours instead of weeks, has economized land, so valuable in manufacturing districts, and has even diminished crime by removing the temptation to theft which the calico spread out in the bleach croft so strongly offered; whilst as applied to old rags, esparto grass, and other paper making materials, cheap paper making cheap books and newspapers, knowledge itself must acknowledge its indebtedness to the nascent state. Nascent oxygen, as evolved by sulphuric acid acting on potassium bichromate, is employed to bleach palm oil, and thus enables us to use a dark coloured material in the manufacture of white soap and candles. Many other cases might be cited, and in the future we may expect to find many applications of this state which so mightily increases chemical energy.

A DRUG STORE IN THE FAR WEST.*

BY LOUIS WEISS, PH.G.

The particular location of the store I am about to speak of is in a small, but by no means insignificant town, named Pueblo (after a tribe of Indians who first located there), on the Arkansas, in Colorado; the time from 1869 to 1872. The proprietor was a physician, a graduate of a western medical college.

Previous to this time, the store was in the hands of two physicians, both carrying on business outside of the store and practice. One was notary public and somewhat of a politician, the other was postmaster, while a brother of his was telegraph operator or drug clerk, as occasion required. All these different branches were carried on in the store, a room about twenty-three feet by forty, in a one-story building, built of adobes (sun-dried brick). On the right hand side on entering the store was a case of glass front boxes; this was called the post-office department. On the left hand side was the telegraph office; back of these on each side, next the walls, was the stock of

* From the *American Journal of Pharmacy*, November, 1877.

drugs, etc. These were in a dilapidated condition; no regard was taken to keep them protected from light, heat, dust or moisture. Patent medicines were there an unknown luxury (!) at that time. Back of the store was a small room, termed the consultation room, into which the wily politician lured his victim, poured into his ears such floods of promises and into his glass such quantities of the enthusiastic beverage as none but the firmest could resist. This was about the state of affairs when my preceptor purchased the store and stock, in the year 1868. The post-office with the telegraph office were removed, and in order to make the store pay, the stock had to be enlarged and other goods added which properly did not belong to the drug business. On my introduction to the store as an apprentice, I found a young man in charge from New York, the doctor having his time pretty well occupied in visiting patients, some of them living a distance of sixty miles from the store, in other small settlements. These trips were generally made on horseback, or per ambulance, and were of frequent occurrence, and on occasions would require his constant attendance for several days, the prevailing troubles being caused by six-shooters, wild bronchos, and last, but not least, cases of confinement. The first three months of my time were spent in learning the names of the different drugs and medicines, and in getting acquainted with the stock, which I found consisted of an innumerable variety of things, such as drugs, patent medicines, wines, liquors, cigars, tobacco, garden seed, paints, oils, varnishes, glass and other painters' material, fixed ammunition, fishing tackle, picture frames, moulding, cord and tassel, clocks, wall paper and trimming, window shades, coal oil, lamps, chimneys, brackets and chandeliers, stationery, playing cards, field glasses, and a variety of minor articles, some of which are, and most others are not, generally to be had in a drug store. The dispensing department was not so well stocked, but was up to the demand, which was generally confined to calomel, blue mass, sulphate of morphia, chloroform, copaiba, spirit of nitre, iodide of potassium and caustic. Valerian, bromide of potassium, sulphate of quinia, and chloral hydrate were sometimes called into use. Elixirs, bitter wine of iron and like preparations were occasionally prescribed, but more frequently called for and sold over the counter. Many of the drugs that are in daily demand in Philadelphia never came into the store in my time. The stock was always bought in large quantities, as the goods were either bought in St. Louis, Chicago or New York—more frequently in New York when drugs proper, and in St. Louis when heavy goods—for the reason that it took from six weeks to two months from the time goods were sent for until they were received, as they had to be carried by wagon a distance of from two to three hundred miles, which was generally accomplished by Mexican bull trains; these were not always at hand, then the goods would lie in the warehouse until transportation could be procured. These trains consisted of from three to thirty wagons, each of which would load from two to four tons. Two of these wagons were coupled together, to the front one were hitched from ten to fifteen yoke of Texan or Mexican steers; these would be driven from eight to twenty miles a day or night, according to load, pasturage or water. This mode of transportation was quite expensive, which, in connection with the charges on the railroad made freight come high, at times footing up eight dollars per hundred pounds gross, delivered at the door from New York.

New York would never receive more than two orders for goods, amounting to from eight to twelve hundred dollars each, in one year, while St. Louis would not receive more than three in the same length of time. The price for medicines was not considered so extraordinary, though a prescription always brought four bits (fifty cents.) at the lowest, no matter how small or for what purpose; a four-ounce mixture, a dozen and a half of blue mass and colocynth pills, or a box of seidlitz powders were considered settled for with six bits (seventy-five cents.) Patent medicines, such as Ayer's pills, pain-killer (small), gargling oil (small) brought four bits, while the dollar preparations were paid for with one dollar and a half without grumbling. Coal oil sold for one dollar per gallon. Onion seeds were worth their weight in gold; the mountaineer put his gold dust on one side of the scale, whatever he wanted to invest, and when it was counterpoised with onion seed it was considered he had value received. Even exchange was no robbery. The people were all very liberal in their dealings; ten cent. customers were as scarce there as one dollar customers are here; less than ten cents.' worth was not sold—ten cents or no charge was the rule.

The druggist and physician was looked upon as a somewhat superior being; his will was done, his word was law. Whenever there was a public meeting or a social gathering, it was not considered complete until the doctor was identified with it in some way. Many a meeting—political or for the organization of a fire company, base-ball club, dancing club or church festival—was started in the store, subscriptions and donations received, and tickets sold for one or all, as the case might be. The doctor's name was always on the ticket for coroner; his services in that capacity were frequently called into use after there had been what they called a neck-tie festival. These were generally held after horses had been stolen and the aggressors caught by the Vigilantes.

In all the time that I was in the Far West I do not remember a single instance of a person asking for simply a dose of oil, as it is called here, the article not being put to use in that way.

Strychnia, arsenic, laudanum, or any other poisonous drugs were sold to any one that pleased to buy, and no questions asked. A friend of the doctor's at one time sent him a case of strawberries; these he was to sell for him merely as an experiment. They sold readily at one dollar per quart, and the individuals considered themselves favoured at having the chance to buy, there not being enough for all. After that we had California grapes, pears, and peaches for sale in their season, which brought six bits and one dollar per pound.

Everything is sold by the pound in that country, excepting eggs, liquids, and dry goods. Water was sold at that time at two bits (twenty-five cents.) per barrel, and was delivered from a tank on wheels, or by placing a barrel on the forked branches of a tree, drawing it to the river by horse, filling and drawing back to the place. This water was generally very muddy, and had to be allowed to settle, or else be clarified by adding alum before it could be used for ordinary purposes; the water obtained from wells was entirely unfit for use, it being very alkaline.

The class of people we had to deal with were as various as were their wants, they coming from all parts of the country, Texas, New Mexico, or the Colony, passing through our town on their way to the mines, and as a matter of necessity stopping and replenishing their stock of medicines, this being the only drug store within seventy-five miles or more around. All owners of sheep, horse, and cattle ranches were purchasers of large quantities of medicines for both man and beast. The Indians and Mexicans would come, complaining of being muncho mala (very sick). If we took pity on poor Lo, and gave him a seidlitz powder in separate doses until the froth came out of his mouth, he thought it a good joke, and would go off and return with another buck, who would likewise complain of being sick, and when treated in the same way would go and do likewise; and so on until the thing became monotonous. The Indians also frequently come to swap (trade) furs, pelts, skins and robes for paint; these in return we would sell for cash. The Mexicans' wants were generally limited to blue ointment, agua dienta (whiskey), medicena per granis (medicine for itch), or pietra infernal (nitrate of silver). The arrival of a soda fountain and generator for the drug store created quite an excitement, and on the day the charging of the fountain for the first time took place there were a considerable number of spectators standing around the back of the store where the performance was going on. As none of us had ever charged a fountain before, we made quite an awkward piece of business of it, and when the pipes got choked up with marble dust, necessitating our taking off one of the nuts, the marble dust and water were blown out with such violence that an alarm was given that the place had blown up, and a general stampede resulted. After we succeeded in making the soda water, we for several reasons found ready sale for it at fifteen cents. per glass, or two bits a glass with a stick in it. The ice for our use we had stored ourselves, or, when such was not the case, bought and paid at the rate of three dollars per hundred pounds for the same.

Things were not alone in this shape in Pueblo, but Denver, the largest city in Colorado, had but little to boast of. With the coming of the railroad, things changed; goods could be had on quicker time and much cheaper, and a gradual improvement in the conducting of the drug business was noticeable. Whereas heretofore the proprietor's formula book had ruled supreme, it was now replaced by the United States Pharmacopœia, and preparations that were heretofore bought in the East we now prepared according to its directions. Prescriptions began to take the place of patent medicines, other physicians having located in the meantime. Goods not proper to the drug store were discarded as opportunities would permit, and replaced by a more complete stock of drugs. At the present time the drug business is carried on in a more legitimate manner in Colorado than in many of the Eastern States. Druggists get a good price for what they sell, and can afford to sell a good and pure article at the price, and such is the intention of the average druggist; when he fails to do so, it is in ignorance and not knowingly that the fraud is committed.

In no other part of the country can a thorough druggist and pharmacist apply his knowledge and ability to so good an advantage as in the Far West. There he has no wholesale stores at hand to send to, where he can get whatever he happens to want on the spur of the moment, but is thrown on his own resources and ability to manufacture,

NOTE ON THE "SAPONIN" OF SARSAPARILLA.

BY PROFESSOR FLÜCKIGER.*

Galileo Pallotta was the first chemist who attempted the separation of an active principle from sarsaparilla. His work appears to have been done early in the present century, shortly after the discovery of the first alkaloids. By treating the aqueous extract of the root with milk of lime, drying the precipitate, and boiling with alcohol he obtained a substance that he claimed to be an alkaloid and named "pariglina," or "parillina;" it is difficult however from Pallotta's meagre description† to form an idea of the properties of this body. According to a note in the *Pharmaceutische Zeitung*, of the 2nd of May last, Dr. Pallotta, who is a Professor of Natural Science at Naples, is still of opinion that in his pariglina he discovered an alkaloid. Whether or not it was a more or less pure form of the constituent of sarsaparilla hereafter referred to, Professor Flückiger considers that Pallotta's name, parillin, should be retained for the special crystallizable body found in that root. Subsequent investigators called this body "smilacin," by which name it has gradually become generally known. That both alkaline and acid properties should have been attributed to this substance by various authors was due probably to the presence of impurities, which however are easily removed by recrystallization. Parillin is decidedly a neutral body. Strangely it is occasionally confused with a body yet uninvestigated, probably a stearoptene, said to occur in the root of *Hemidesmus indicus*, R. B., which has been called Indian sarsaparilla, although it does not resemble the *Smilax* root.

In 1859, O. Gmelin stated that parillin is decomposed by acids into sugar and a substance insoluble in water, a statement that has been questioned by others. Some experiments carried out in the author's laboratory by Klunge also pointed to the glucoside nature of parillin; but doubt was not altogether dispelled, because the unaltered parillin itself reduces alkaline cupric tartrate, though very slightly. For these reasons Professor Flückiger considered an examination of parillin desirable in order at least to ascertain whether it was a glucoside. Meanwhile, this point was decided last year by Otten,* who however looks to Professor Flückiger to carry on the investigation. Professor Flückiger suggests that in order to facilitate a comparison of the nearly allied, if not identical, substances, saponin and parillin, a more exact investigation of the former, prepared from cheaper materials, should be undertaken by others, he himself dealing with the sarsaparilla "saponin" or parillin.

The following method of preparation is recommended as preferable to that given in Pharmacographia. The chopped and bruised sarsaparilla root is heated at least twice with alcohol of about 0·835 sp. gr., the liquid poured off and the marc pressed, and the product distilled until the residue in the retort equals one-sixth, or rather less, of the weight of root used. The liquid, which is strongly coloured but not particularly thick, is diluted gradually with one and a-half times its weight of water, which causes the formation of a light yellowish loamy precipitate of crude parillin. The liquor is allowed to stand some days in the cold, after which the very dark-brown clear liquor can be decanted off. With the deposit is then mixed about half its volume of alcohol, and the mixture is filtered, then precipitated, and the precipitate washed with very dilute spirit, containing about 20 to 30 per cent. by weight of alcohol. This operation depends upon parillin being less soluble in dilute spirit than in ordinary alcohol or in water, it being precipitated from an alcoholic solution by the addition of water, or from an aqueous solution by the addition of spirit. In alcohol of sp. gr. 0·835 it is freely soluble. Although freely soluble in boiling water and very slightly soluble in cold water, it crystallizes best from alcohol. Prepared in this way, after treatment with animal charcoal, the parillin is obtained pure white, either in thin scales or prisms, showing a double refraction in polarized light.

In several experiments with different kinds of sarsaparilla, working with about 4 kilograms of root, the author obtained about 0·18 to 0·19 per cent. of pure white crystallized parillin. Some more parillin can be obtained by concentrating the mother-liquor and precipitating with a little water, or boiling it with alcohol. This second yield, however, is less readily purified, it becoming mixed with sodium chloride, which occurs plentifully in all aqueous extracts of sarsaparilla. The author failed to obtain parillin from the root stock of *Smilax aspera* or from China root, but the quantity operated on was small.

* Abstract of article in the *Archiv der Pharmacie*, 3rd series, vol. vii., p. 532.

† *Journal de Pharmacie*, x. 543.

* "Vergleichend histiologische Untersuchung der Sarsaparillen aus der pharmacognostischen Sammlung des pharmaceutischen Institutes zu Dorpat, nebst einem Beitrage zur chemischen Kentniss dieser Drogue." Dorpat, 1876. In the latter part of this exhaustive treatise, which is too long for insertion entire in this Journal, and unsuited for abstraction, Herr Otten identifies a second substance present in sarsaparilla with saponin, and from his experiments arrives at the conclusion that parillin has an action similar to, but not so strong as that of saponin, and that it is sapogenin *plus* sugar. Dragendorff has already pointed out that saponin and senegin affect the heart's action more energetically when impure than pure, and Otten suggests that the action of these allied bodies, as well as of parillin, is dependent upon another body always occurring together with them.—ED. PHARM. JOURN.

Marquis reports (*Archiv d. Pharm.*, ccvi., 342), that he obtained 1·75 per cent. from sarsaparilla, 5·12 per cent. from *Smilax aspera*, and over 0·60 per cent. from China root.

Air-dried parillin contains water of crystallization, which it loses at 100° C.; but different experiments gave results varying from 6 to 12 per cent. At about 140° it cakes together, melts with partial decomposition at about 210°, and acquires a strong brown colour by further heating. Melted parillin readily takes fire, and burns quietly after the removal of the flame, but it is difficult to effect a perfect combustion of the light charcoal at first produced. Pure crystallized parillin is almost insoluble (about 1 in 10,000) in cold water, but a solution prepared with boiling water remains supersaturated after it has become cold. It dissolves at 25° C. in 25 parts of alcohol, sp. gr. 0·814, and much more freely in boiling alcohol, crystals separating from the latter on cooling. Parillin dissolves in warm chloroform to a thin liquid which cannot be filtered, and yields upon evaporation no crystals, but only an amorphous varnish, which, however, can be recrystallized from hot alcohol.

Parillin does not seem to be provocative of sneezing, like saponin from quillaia, cyclamen, and other sources is. Solid parillin has not an acrid taste; an alcoholic solution has more acridity than an aqueous solution, but incomparably less than saponin solution. No effects were observed to follow the use of such solutions of parillin. Parillin in alcoholic solution has no rotatory action and does not colour litmus paper.

Parillin gives with strong sulphuric acid a pure yellow solution that becomes of a beautiful cherry-red at the edges, due to dehydration. With dilute sulphuric acid (10 per cent.) it becomes greenish when heated; kept in a water-bath it gradually becomes a beautiful red and finally brown. Phosphoric acid acts similarly, but gives more of a yellow-green colour. The addition of nitric acid, nitrates, or bromine to the sulphuric acid solution produces no special colour.

An aqueous solution of parillin gives with an alcoholic, but not with an aqueous, solution of acetate of lead, a precipitate again soluble in excess of the lead salt or of alcohol. No precipitate is produced by subacetate of lead or tannic acid. In the cold a solution of parillin does not reduce alkaline cupric tartrate, but at 80° or 90° a separation of cuprous oxide takes place in a few hours. But it produces no separation of metallic bismuth from a solution of bismuth tartrate in caustic alkali even after prolonged heating in a water-bath. Boiled with dilute sulphuric or hydrochloric acid, and the filtrate neutralized, it freely reduces cupric tartrate in the cold after a short time, and with the least warmth immediately. It is therefore evident that parillin is a glucoside.

The parigenin produced by the decomposition of parillin with dilute mineral acids is perfectly insoluble in boiling water, so that it can be readily separated and washed. It is probable that the sugar separated is at least partially crystallizable.

During the decomposition of the parillin by dilute mineral acids the liquid acquires a strong green fluorescence. The fluorescence is still more marked when parillin in solution in chloroform containing alcohol is decomposed with dry hydrochloric acid gas. This liquid is at first colourless, and does not develop heat, but suddenly becomes brown by transmitted light and full green by reflected light. Upon the addition of water, or evaporation of the alcohol and chloroform, white flocks of parigenin are formed whilst sugar remains in the solution. As in similar cases the fluorescence of parillin is very persistent. An unweighable quantity heated with a few drops of strong sulphuric acid in a water-bath gives a liquid that can be diluted with 100 c.c. of acid without losing its fluorescence, but dilution with water causes its immediate disappearance. After saturation with ammonia the liquid does not again show the green shade. In this behaviour and the colour parillin gives with a little sulphuric acid in the cold lie the best means at present known for its detection. It is noticeable that the "saponin" of digitalis, to be presently mentioned, Schmiedeberg's digitonin, also gives this fluorescence, but not cyclamin.

Three analyses of parillin (smilacin) given in Gmelin on the authority of Henry, Peterson, and Poggiale, agree fairly well with the figures obtained by Klunge in two analyses. But Professor Flückiger believes that these specimens were contaminated with parigenin. Parillin dissolved in warm water, which does not take up parigenin, filtered, and reprecipitated by alcohol, gave between 2 and 3 per cent. less carbon, or as a mean of three analyses, C = 60·4; H = 9. Three other analyses of another sample gave the following figures, showing still less carbon:—

C	57·66	56·80	56·4
H	—	8·27	8.3

These figures appear to show a remarkable relation between parillin and the saponin prepared by Rochleder, Schwarz, and von Payr from the "soap root" erroneously attributed to *Gysophila Struthium*, which had the formula $C_{64}H_{106}O_{36}$. If this formula be written $C_{32}H_{53}O_{18}$, the next lower in a homologous series of "saponins" would have the formula $C_{31}H_{51}O_{18}$. Possibly this is the place of the "saponin" found by Schmiedeberg in commercial digitalin, and named "digitonin;" he, however, attributed to it the formula $C_{31}H_{52}O_{17}$. Should there really be a homologous series of "saponins," the eighth step upwards from Rochleder's saponin would be the compound $C_{32}H_{53}O_{18} + 8CH_2 = C_{40}H_{69}O_{18}$. This would require 57·3 per cent. of carbon, and 8·2 per cent. of hydrogen, figures not irreconcilable with those obtained in the last three analyses of parillin, whilst the mean of the previous three analyses would agree with the formula of a saponin $C_{32}H_{53}O_{18} + 16CH_2 = C_{48}H_{85}O_{18}$, which would require 60·7 per cent. of carbon and 9 per cent. of hydrogen. Subsequently, however, Rochleder has published the formula $C_{32}H_{54}O_{18}$ for his saponin, which agrees better with the results of its decomposition, and also pretty closely with the saponin prepared by Cristopherson from Levant soap root, quillai bark, *Saponaria officinalis* and *Agrostemma* seeds, which he believes to be identical as obtained from all four sources. As, however, this would only slightly alter the hydrogen it is not inconsistent with the homologous nature of the "saponins." From these and other considerations it appears probable that there exists a series of saponins with the general formula $C_nH_{n2-10}O_{18}$.

Sapogenin and parigenin produced, with sugar, when saponin and parillin are split up under the influence of acids, are closely allied, as is also cyclamiretin resulting from the decomposition of cyclamin, and possibly they are also homologous.

GARRYA FREMONTI.*

BY DAVID WILLIAM ROSS, PH.G.

From an Inaugural Essay.

Having obtained from Professor Maisch a small quantity of the branches and root of the above plant, I endeavoured to procure a larger supply from California, but without success; my experiments were therefore not as satisfactory as I could have wished, but I have nevertheless succeeding in isolating a bitter principle, which, from the tests, seems to be an alkaloid, for which I propose the name of *Garryina*. It was obtained by the following process:—Two troy ounces of the dried leaves were exhausted with alcohol, and about two pints of a dark green tincture obtained. It was concentrated to about two fluid ounces, and an equal bulk of water was added, which precipitated the resinous matter. The

* From the *American Journal of Pharmacy*, December, 1877.

filtrate had a dark brown colour, a very bitter taste, and an acid reaction to litmus paper. The precipitated resin, when washed with water until tasteless, was of a light yellow colour. Part of the filtrate was acidulated with muriatic acid and iodo-hydrargyrate of potassium added, which gave a white precipitate. Ammonia water added in excess changed the colour to a dark greenish-yellow. Petroleum benzin or ether, agitated with the solution, did not extract any of the bitterness. Chloroform was agitated with the ammoniacal solution in six separate portions, being allowed to remain in contact each time for twenty-four hours, with frequent agitation, then separated and evaporated spontaneously: a light brown very bitter substance was left, having an alkaline reaction, and being soluble in alcohol, slightly in water. It was dissolved in water acidulated with muriatic acid, digested with animal charcoal, and filtered. The filtrate was very bitter; after being evaporated over a water-bath and set aside for a few days, a few cubical crystals were obtained, which had a bitter taste, were soluble in alcohol and water, and gave the following reactions:—With sulphuric acid, after a few minutes, a purple colour; with chromate of potassium and sulphuric acid first a red, then a yellow, and lastly a green colour. Its aqueous solution was precipitated by iodo-hydrargyrate of potassium.

Besides the garryina, the leaves contain resin, chlorophyll, tannin and sugar. They yielded 5 per cent. of ash, containing salts of potassium, calcium, iron and magnesium. The root contains the same alkaloid, answering to the same tests, and obtainable by the same process, except that digestion with alcohol was found to be advantageous. The root contains also resin, starch and sugar, and yielded two and one-half per cent. of ash, in which the same bases were found as in the ash of the leaves.

ADDITION OF CHLORAL HYDRATE TO THE POISON SCHEDULE.*

At the *Council Chamber, Whitehall*, the 13th day of *December*, 1877.

By a Committee of the Lords of Her Majesty's Most Honourable Privy Council.

PRESENT:

Lord President.
Viscount Sandon.
Mr. Sclater-Booth.

WHEREAS by "The Pharmacy Act, 1868," section 2, it is enacted that the Council of the Pharmaceutical Society of Great Britain may from time to time, by Resolution, declare that any Article in such Resolution named ought to be deemed a poison within the meaning of that Act; and thereupon the said Society shall submit the same for the approval of the Privy Council, and that if such approval shall be given, then such Resolution and approval shall be advertised in the *London Gazette*, and on the expiration of one month from such advertisement the Article named in such Resolution shall be deemed to be a poison within the meaning of that Act:

And whereas the Council of the Pharmaceutical Society of Great Britain did, on the 7th day of November, 1877, resolve and declare in the words following:—

"That by virtue and in exercise of the powers vested "in the Council of the Pharmaceutical Society of "Great Britain, the said Council does hereby resolve "and declare that *Chloral Hydrate and its preparations* "ought to be deemed poisons within the meaning of "the Pharmacy Act, 1868, and ought to be deemed "poisons in the Second Part of the Schedule A of the "said Pharmacy Act, 1868."

And whereas the said Society have submitted the said Resolution for the approval of the Privy Council, and the Lords of the Privy Council are of opinion that the said Resolution should be approved:

Now, therefore, their Lordships are hereby pleased to signify their approval of the said Resolution.

C. L. Peel.

* From the *London Gazette*, Dec. 14, 1877.

THE BOARD OF EXAMINERS FOR 1878.*

At the *Council Chamber, Whitehall*, the 13th day of *December*, 1877.

By a Committee of the Lords of Her Majesty's Most Honourable Privy Council.

PRESENT:

Lord President.
Viscount Sandon.
Mr. Sclater-Booth.

WHEREAS there was this day read at the Board a letter to the Clerk of the Council from the Secretary and Registrar of the Pharmaceutical Society of Great Britain, dated the 5th day of December, 1877, in the words following:—

"I have to acquaint you that at a meeting of the "Council of this Society held to-day the Pharma- "ceutical Chemists whose names appear on the other "side were appointed Examiners for the ensuing year, "and I am requested to submit their names to the "Privy Council for approval, in accordance with the "Bye-laws of the Society.

"Neither of the persons appointed has held office as a "Member of the Council of the Society during the "year preceding the date hereof."

"ENGLAND AND WALES.

"Alfred Allchin.
"James Benjamin Barnes.
"Frederick Baden Benger.
"Henry Bowman Brady.
"Michael Carteighe.
"Octavius Corder.
"Samuel Gale.
"Frederick Janson Hanbury.
"John Samuel Linford.
"William Martindale.
"John Moss.
"William Southall.
"George Spratt Taylor.
"Charles Umney.

"SCOTLAND.

"William Ainslie.
"John Borland.
"David Kemp.
"Alexander Kinninmont.
"William Gilmour.
"Alexander Noble.
"John Bertram Stephenson.
"James Robertson Young."

And whereas by the sixth section of "The Pharmacy Act, 1868" (31 and 32 Victoria, cap. cxxi.), it is provided that no person shall conduct any examination for the purposes of that Act until his appointment has been approved by the Privy Council:

And whereas it appears that the persons appointed are as required by the Bye-laws of the Society, under the age of 65 years, that none of them have held office as Members of the Council during the preceding twelve months, and that no objection exists to the approval of the Lords of the Council being given to such appointments:

Now, therefore, their Lordships are pleased to approve the appointments of the said persons as Examiners for the year 1878, for the purposes of the Pharmacy Act, 1868.

C. L. Peel.

* From the *London Gazette*, Dec. 14, 1877.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 22, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE REPORT OF THE EARLY CLOSING ASSOCIATION.

SOME of our readers who may receive a copy of the new report of the Early Closing Association will naturally open it with some curiosity as to the outcome of the passing of certain resolutions at the meeting in the Society's Theatre, Bloomsbury Square, last April; but, we are sorry to say, they will find little beyond an account of the meetings referred to. There was considerable talk then of local meetings to be held and individual efforts to be made, and an influential committee was formed to lend its co-operation; but the Report confirms a previous impression that up to the present time nothing more has been done, and that the Committee's services have not yet been once applied for, if indeed it has met. The Association is able to report decided advances with respect to the hours of business of drapers, grocers, tailors, and bootmakers; but there is nothing to show that the apathy of chemists and druggists was more than temporarily disturbed by the eloquence of Mr. LONG and his coadjutors.

The Report, however, illustrates in the experience of the Association the great difficulty that awaits any attempt to take united action for securing earlier closing. It is found that in seeking to obtain an agreement for earlier closing among a large number, especially of the smaller class of shopkeepers, it is very difficult to secure the requisite amount of unanimity. Two or three stand out in opposition to the proposed arrangement, and deter a much larger number from acting according to their better judgment. Sometimes the refusal of even a single employer to close at a given hour has been fatal to the prospects of early closing in an entire neighbourhood. Of course in these days of keen competition such a result is quite a natural sequence to the cause, and probably such an explanation might very frequently take the place of the euphemism, "the public convenience," which has so frequently been seriously discussed as a reason for the chemist and druggist vieing with the publican in respect to late hours.

The disappointment attending the breakdown, through the obstinacy or fears of individuals, of well conceived efforts for securing earlier closing in a district, has naturally suggested to some minds an appeal to Parliament, and the Association has been more than once requested to promote a Bill in Parliament for making compulsory the closing of places of business at a certain hour. But such a proposition is evidently impracticable, and there can be no doubt that the Board of Management is right in its conclusion that the closing of shops in the evening will never be undertaken by the Legislature. The Report points out, however, that the absence of any decided effort on the part of shopkeepers to throw off this incubus of late hours is very provocative of an attempt on the part of shop-assistants to seek the relief they need through the medium of trades' unions.

We are far from suggesting that the business of a chemist and druggist can be arbitrarily confined within certain specified hours, in the same sense as many other businesses can. Neither do we deny that in some districts a great improvement with respect to the hours during which chemists and druggists shops are kept open has taken place during the last twenty years. Our complaint is that all is not done that could be done, and that those who at the risk of loss have volunteered to act as leaders in the movement have not yet received the general support they were entitled to reckon upon. Eight months ago it was agreed at a meeting which was fairly representative of the chemists and druggists of at least an important section of this metropolis, that, Saturdays excepted, the window shutters on week days might be closed at 8 o'clock, and the doors at 8·30 without inconvenience to the public, and that even on Saturdays an abridgment of the hours of labour might be effected. We have not heard it even whispered since that there was anything Quixotic or unreasonable in such an arrangement, and yet to what a large extent it is still ignored! We appeal to all those who concur in the spirit of the resolution passed last April, and who have at present not acted upon it, not to be deterred any longer by fear of want of unanimity, but to determine at once to do all that in them lies by individual, if not by associated effort to secure so desirable an end.

CHLORAL HYDRATE AND THE POISON SCHEDULE.

IT will be seen by the extract from the *London Gazette*, quoted on another page, that the resolution passed by the Council of the Pharmaceutical Society at its meeting in November, to the effect that Chloral Hydrate and its preparations ought to be deemed poisons within the meaning of the Pharmacy Act and included in the second part of the Schedule A of that Act, has received the approval of the Lords of the Privy Council. After the 14th of January, 1878, therefore, it will be illegal for unregistered persons to sell chloral hydrate or its preparations, and it will be unlawful for any person to sell them unless the box, bottle, vessel, wrapper, or cover containing them are distinctly labelled with the name of the article, the word "poison," and the name and address of the seller. The reason for this step is very obvious. The enormous consumption of chloral hydrate, and its frequent administration by unskilled hands have led to several fatal accidents, and in placing its sale under the same regulations as that of laudanum the Council has acted in accordance with the recommendations of several coroners and the medical press generally. In Ireland, chloral hydrate has been included in the schedule of poisons for some time past.

A WORD OF CAUTION.

We should be very sorry at any time, and especially at this season of the year, to say a word that would have a tendency towards checking the full gratification of the generous impulses of pharmacists. But it is desirable to secure as far as possible that the recipients of their benevolence should be deserving of it. We have reason to believe that this is not always the case, and that, even recently, pharmacists who have thought they were relieving the necessities of some poorer members of the craft or their families, have been made the victims of plausible tales. We would suggest that the very best way of giving such alms, especially to strangers, is through the medium of the Benevolent Fund, the organization in connection with which so facilitates the making of proper inquiries, whilst cases of urgency can be relieved at once from the Secretary's Casual Fund. But should the donors prefer to relieve unknown persons themselves, it would be as well to delay doing so until they have communicated with the Secretary, Mr. Bremridge, who, it is needless to say, would willingly and at once communicate to them any information he may possess respecting the applicants.

DEATH OF M. CAP.

French pharmacy has lost one of her veteran members, M. Paul Antoine Cap having died in Paris on the 12th ult., at the age of ninety years. He was a correspondent of the French Academy of Medicine, and during the last forty-two acted as one of the associated editors of the *Journal de Pharmacie et de Chimie*. He was also an Honorary Member of the Pharmaceutical Society of Great Britain, having been elected in 1856.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

A soirée in connection with this Association is to be held in the Town Hall, Birmingham, on the 23rd of January, 1878. A large number of objects of interest are to be shown, and amongst them the telephone. There will also be practical illustrations of the mode of carrying on various operations in chemistry and pharmacy, perfumery, etc.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

December 12, 1877.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, Taylor, and Umney.

MAJOR EXAMINATION.

Seven candidates were examined. *Three* failed. The following *four* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Duncalf, Jas. Mills Woolfenden Congleton.
Mortlock, William John.........Peckham.
Tamplin, Charles Edward ......Kingston-on-Thames.
Turner, George Thomas ....London.

MINOR EXAMINATION.

Eighteen candidates were examined. *Six* failed. The following *twelve* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bascombe, William ....Nottingham.
Brown, Francis Arthur ....Liverpool.
Cooper, Frederick Ashley ......Cockermouth.
Eardley, James Furnival ......Hulme.
Heywood, John Henry ....Lincoln.
Hutton, Harry ....Warwick.
McConnal, Alan ....Dudley.
Martin, William Lee ....Derby.
Martlew, Thomas..................Carlisle.
Mather, John Henry ....Newcastle-on-Tyne.
Pursell, John Rushton ....Liverpool.
Sanders, William Josiah.........Cardiff.

MODIFIED EXAMINATION.

Three candidates were examined. *Two* failed. The following passed, and was declared qualified to be registered as a Chemist and Druggist:—

Mills, William Drew ....London.

December 13, 1877.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, Taylor, and Umney.

MAJOR EXAMINATION.

Seven candidates were examined. *Six* failed. The following passed, and was declared qualified to be registered as a Pharmaceutical Chemist:—

Phillips, Evan ....St. Clears.

MINOR EXAMINATION.

Twenty candidates were examined. *Eleven* failed. The following *nine* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bowden, Thomas Lemon ......Barnstaple.
Collinson, Frederick William...Alnwick.
Finney, Arthur Cook ....Gainsborough.
Green, Arthur ....Halifax.
Holmes, James William ....Norton, Malton.
Huband, Alfred Edward.........Birmingham.
Lakeman, Jasper James.........London.
Tritton, Charles Edmund ......Bristol.
Warrell, Edmund...................London.

December 19, 1877.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, Taylor and Umney.

Dr. Greenhow was present on behalf of the Privy Council.

MINOR EXAMINATION.

Twenty-five candidates were examined. *Fifteen* failed. The following *ten* passed, and were declared qualified to be registered as Chemists and Druggists:—

Mansergh, William ....Burton-in-Lonsdale.
Metcalfe, John......................Bedale.
Morgan, David.....................Llandilo.
Pass, William John Warhurst..Bury.
Peet, Henry ....Gosberton Hall.
Richardson, Alfred ....Manchester.
Roberts, Morgan ....Cardiff.
Skelton, Thomas ....Maryport.
Wood, Frederic Percy...........Bolton.
Wray, Edward ....Bishop Auckland.

December 20, 1877.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, Taylor, and Umney.

MINOR EXAMINATION.

Twenty-six candidates were examined. *Fifteen* failed. The following *eleven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Allison, Joseph William ....Sunderland.
Dingle, James Hender............Penzance.
Gourd, William ....Stoke, Devonport.
Hunt, George ....Landport.
Massey, Richard Francis ....Lower Tooting.
Powell, Walter......................Cleveland.
Smith, Joseph ....Sneinton.
Smith, Morgan......................Trecynon.
Will, William Watson............Montrose.
Winter, Harry ....Cambridge.
Wordsworth, George ....York.

Provincial Transactions.

HULL CHEMISTS' ASSOCIATION.

The annual supper of the members of this Association took place at the Cross Keys Hotel, on Wednesday evening, December 12. The chair was occupied by Mr. C. B. Bell (President), and the vice-chair by Mr. J. F. Smith. There were also present the Mayor (Alderman R. Waller), Dr. A. K. Rollit, and Councillors Gibson, Leak, Toogood, Smith, and Fryer, Mr. R. Micks, and other gentlemen. Letters of apology were read from the Rev. J. M'Cormick and Alderman Seaton. The usual loyal and patriotic toasts were given from the chair. "The Archbishop and Clergy of the Diocese, and Ministers of all Denominations" was suitably acknowledged by the Rev. J. Gilmour. "The Mayor and Corporation" was responded to by the Mayor.

Mr. E. Allison gave "The Town and Trade of Hull," and, referring to the trade of the majority of the gentlemen present, expressed the opinion that that trade had been a little over legislated for.

Councillor T. J. Smith responded, and touched upon the recent visit of the Associated Chambers to this town. He then went on to refer to the evils with which the chemists and druggists had to contend, and alluded particularly to the prosecutions at Selby. He was glad that it had been agreed that no prosecution for adulteration should be instituted in Hull without the consent of the Sanitary Committee, as this would prevent those vexatious prosecutions which had taken place in other towns.

The Mayor submitted the toast of "The Hull Chemists' Association," referring to the various qualifications which he considered must be necessary to make a chemist and druggist.

The President, in responding, thanked the members of the Association for re-electing him as President for the third year. The Association was formed for no aggrandisement on the part of chemists and druggists, but for two objects solely, viz., the protection of the trade and the education of the apprentices, and he considered those were two worthy objects for any association to have in view. The President went on to allude to the difficulties which chemists and druggists had to overcome in the course of business, and alluded especially to the progress made by the students who attended the lectures given under the auspices of the Association.

Mr. Wokes gave "The Honorary Solicitor to the Association" (Dr. A. K. Rollit), which toast was warmly honoured.

Dr. Rollit humorously responded, and afterwards spoke of the advantages of education to the younger members of the trade especially.

Mr. Thyar proposed "The Officers of the Association," which was acknowledged by the Vice-Chairman.

The Vice-Chairman then gave "The Medical Profession," observing that the chemists were extremely desirous of working in amity with that profession.

Dr. Gibson, in acknowledging the toast, remarked that he knew there was a desire amongst medical men to be in good fellowship with the chemists and druggists. He hoped that the time would come when no medical man would dispense his own drugs, and although there were many difficulties in the way, those difficulties had been overcome in France and Germany, and he did not see why they could not he overcome in England.

Mr. Woodruffe briefly gave "The Pharmaceutical Society," which was acknowledged by the Chairman.

Mr. Stoakes (Hon. Sec.) proposed "The Lecturers," for whom Mr. J. C. Niven responded, and dwelt upon the fact that the number of students was not in proportion to the size of the town and number of chemists and druggists there.

Dr. Gibson suggested that the apprentices had scarcely sufficient leisure during which to study, and he thought this was worthy of consideration by the masters.

Mr. Oldham submitted "The Health of the Visitors," who found a respondent in Mr. R. Micks.

Councillor Leak gave "The Health of the Chairman." "The Press," and other toasts followed.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The following discussion followed reading of the paper by Mr. Fairlie, printed in last week's Journal, p. 471:—

Mr. Kinninmont believed that if the trade were more remunerative to assistants and employers, the scheme advocated by Mr. Fairlie would follow, but as matters are at present he failed to see how it could be accomplished, and where the necessary funds would come from.

Mr. J. A. Clarke pointed out that in Glasgow there are already numerous advantages for study if assistants could only manage the time; but he also stated that in two cases where he had given his apprentices time to attend classes they ultimately went into the medical profession for no other reason than that it is much more remunerative.

The President (Mr. Daniel Frazer) took exception to some of Mr. Fairlie's proposals and also defended the course pursued by the Pharmaceutical Society, in admitting to its meetings one reporter only, holding that the Society being a business or a private Society, could make what rules it chose, nor did he (the President) think it advisable that the proceedings should be open to all reporters.

One or two other members having taken part in the discussion, Mr. Fairlie replied briefly, stating that he had found that by letting apprentices or assistants away to classes where they came in contact with medical students, there was a great temptation to go into the medical profession, but that was not what was wanted, they desired that these young men should remain in the trade, and he believed this would be best accomplished by classes arranged apart from the medical students.

The President moved a hearty vote of thanks to Mr. Fairlie for his paper, to which (the President remarked) he was *fairly* entitled.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

The first ordinary evening meeting of the session was held on Tuesday, December 11, in the Memorial Hall. The President, Mr. W. S. Brown, occupying the chair.

Mr. Benger being prevented from reading his paper on the "Telephone,"

Mr. Louis Siebold delivered a short lecture, illustrated by experiments, on—

Poisonous Wall Papers.

Alluding to the popular impression that green wall papers alone were to be suspected, the lecturer stated that blue, red, brown, pink, etc., in fact, papers of every colour except grey and white, were seldom free from arsenic. Out of sixty or seventy wall papers of various colours analysed by him only ten were harmless, the rest contained arsenic.

Of the various tests for arsenic one of the most convenient and delicate consisted in the production, in the presence of zinc and hydrochloric acid, of arseniuretted hydrogen, which could at once be detected by holding over the mouth of the test-tube containing the reagents a piece of paper moistened with nitrate of silver solution. By this method one five-hundredth of a grain of arsenious acid almost instantly gave a distinct dark stain of metallic silver.

This test, however, had not hitherto been much applied in the examination of wall papers, since the latter often containing sulphur compounds, the sulphuretted hydrogen evolved also blackened the nitrate of silver paper, and so interfered with the reaction. The difficulty could be surmounted by placing in the test-tube a plug of cotton wool soaked in acetate of lead solution, which absorbed and removed the SH_2 and permitted the AsH_3 to pass through; but to preclude the possibility of error from traces of SH_2 escaping, Mr. Siebold made use of the following modification of the test:—To the pure hydrochloric acid containing the sample of paper add weak iodine solution till it is in slight excess (starch may be used, if necessary, to indicate this point), then add the zinc. The iodine decomposes any sulphur compounds capable of evolving sulphuretted hydrogen, and any blackening of the nitrate of silver paper is then due to the presence of arsenic.

Mr. Siebold also read a paper on—

Tests for the Indication of Acidity and Alkalinity.

The lecturer first referred to litmus, which, though very delicate, was open to the objection that it was difficult to determine the exact point at which neutrality was reached, especially by gas light. This drawback disappeared with the use of a sodium flame, as by its light red litmus solutions appeared colourless, and blue litmus of an inky black, the transition from an acid to an alkaline solution being thus well marked.

The following five substitutes for litmus were then considered:—

1. *Cochineal*, giving with acids a pale yellow solution, instantly turned by alkalies to purple or pink, the change being well marked by day light or gas light.

2. *Logwood.*—Acid solutions pale yellow, changed by alkalies to purple.

3. *Brazilwood.*—Acid solutions greenish-yellow, giving a distinct transition on the addition of alkalies to deep red; a test preferred by the lecturer to logwood and useful for the titration of calcium carbonate in potable waters.

4. *Alizarine.*—Alkaline solutions of a deep purple colour changed by acids to yellow and restored by alkalies; this is far superior to litmus, as an acid so weak as not to affect the latter will react distinctly on alizarine solution.

5. *Salicylate of Iron.*—Salicylic acid solution on addition of perchloride of iron becomes purple owing to the formation of salicylate of iron. In weak acid solutions this colour is less striking than in neutral ones, but is gradually heightened by the addition of alkalies, being most intense when the point of neutrality is reached. Directly this point is passed and the solution becomes akaline, the colour instantly vanishes.

At the conclusion of this paper, which was also accompanied by experiments, Mr. J. T. Slugg proposed a vote of thanks to Mr. Siebold for his exceedingly interesting lectures. The motion was seconded by Mr. Westmacott and cordially passed.

Proceedings of Scientific Societies.

PHILADELPHIA COLLEGE OF PHARMACY.

The first pharmaceutical meeting of this Society for the session was held on Tuesday, October 16. Mr. Charles Bullock, Vice-President, took the chair.

Professor Maisch presented on behalf of Mr. J. J. Brown, of Oakland, California, a pair of bulbs of the *Chlorogalum pomeridianum*, Amolia, the California soap-root, remarkable for the large percentage of saponin which it is said to contain, as also for a peculiar mucilage. These two constituents caused the Indians and early Spanish settlers to esteem it very highly as a detergent; and it is so efficient and harmless that it is still preferred for washing laces, embroideries, and such like fabrics, to any soap attainable. A cold infusion of the bulb may be used in place of soap as a dentifrice, a shampoo liquid, and a valuable lotion for both face and hands. But little use has been made of it in medicine, although it is claimed to have some virtue when employed as a lotion to ulcers and in skin diseases; the fibres have been separated from the bulbs by the Chinese, washed, dried and put in the market for making *hair* mattresses. The plant grows abundantly upon the dry hill-sides of the Pacific coast, from Oregon to Central America, and perhaps further south; but as its flowers open at night time Mr. Brown has not been able to obtain them.

Mr. L. R. Carbonel presented specimens of a plant which Professor Maisch stated to be a eupatorium, and which is used in Cuba both as a purgative and emetic; for the first purpose in about thirty grain doses, and double as much for an emetic.

Mr. Neppach presented a specimen of genuine Oregon balsam of fir, which is probably the product of *Abies menziesii*, Lindley, a tree growing from Sitka to California and Colorado, and generally known under the name of *balsam*. The factitious so-called Oregon balsam of fir was exhibited alongside of the genuine article, and observed to be of a darker colour and a terebinthinous taste, while the new article resembled Canada balsam in colour and transparency, and had an agreeable, somewhat different aromatic odour. Mr. Neppach stated that the oleoresin brought by him was not an article of commerce in Oregon, where balsam of fir was procured from the eastern section of the continent; he obtained the sample in Oregon by puncturing the small vesicles which formed on the bark of the balsam tree of the Pacific coast.

Professor Remington read a paper by Mr. Henry Trimble, upon—

The Use of Chlorine Water and Ammonia as a Colour Test for Estimating Quinia.

"First a standard solution is prepared by taking one centigram of quinia or one of its salts, dissolving it in about five c.c. of fresh chlorine water, adding ten c.c. of solution of ammonia, and diluting this dark green liquid in a glass cylinder to one hundred c.c.

"In estimating a one-grain quinia pill, for example, a similar cylinder is taken, into which is placed a fractional part of the solution obtained by treating the disintegrated pill with chlorine water and ammonia, and diluting with water until it exactly corresponds in colour with the standard solution; then by a little calculation the amount of quinia is known. By a little practice the results become surprisingly accurate, and the process requires very little time compared with the more exact gravimetric methods. It is true that quinidia if present interferes with the results, but it is not so liable to be fraudulently employed as the cheaper alkaloids.

"To what extent this process may be employed for the estimation of quinia and quinidia in bark the author was not prepared to say, but he thinks that, with certain precautions, it might admit of application for this purpose. The same principle is extensively used in determining the amount of carbon in iron and steel, with very satisfactory results."

Professor Maisch said that he was glad Mr. Trimble had not overlooked the fact that quinidia produced a very similar reaction, and then commented on the common statement, that the presence of chlorohydric acid prevented the appearance of the green coloration, which he stated to be erroneous, the point necessary to a successful result being the presence of sufficient chlorine before the ammonia is added.

Mr. Boring called attention to samples of caraway, the want of flavour of which first called attention to its inferiority; when sieved about 38 per cent. of very small and immature fruits, almost devoid of taste, were separated, the remainder being better, but still inferior to an unobjectionable article; the same remark applies to most of the anise now offered for sale in the Philadelphia market.

SOMERSETSHIRE ARCHÆOLOGICAL AND NATURAL HISTORY SOCIETY.

English Names of Wild Flowers and Plants.*

BY REV. W. TUCKWELL.

(*Concluded from page* 357).

Many names of plants contain the geography of their origin. The Canterbury bell is obvious, so is the Guelder rose. The alexanders, a rare plant round Taunton, but growing in great quantities at Blue Anchor, comes from Alexandria; the candytuft from Candia; the elecampane, from Campania; the medick from Media; the carraway from Caria; the walnut or welsh nut from north of Italy, called *Wälsh* by the Germans. Peach is *persicus*; shalot, *ascalonicus*; spinach, *hispanicus*; the damson, rightly spelt as damascene, tells its own tale, which is less clear in the case of the dame's or damascene violet, a corruption extended and perpetuated, as often happens, by its Latin equivalent, *matronalis*.

All first attempts at classification, etymological or other, leave a large margin of miscellaneous items refusing to be ticketed or systematized; and there remain a few names falling under none of the categories which I have cited, yet too interesting to be omitted. Such is apple, retaining its form in the Teutonic, Celtic, Sclavonic, and Lettish languages, and springing apparently from the Sanskrit *ap*, water, which reappears inverted in the Latin *pa* of *padus*, *po* of *poto* and *pomum*, meaning therefore the water fruit or juice fruit. Such again is daffodil, the daffadowndilly of Spenser and other poets. It is a combination of *sapharoun*, or saffron lily, with *asphodelus*, the old English affodilly. With the taste for alliteration often shown in popular names the sapharoun lily blending with the affodilly became by a mutual compromise daffadowndilly, whence daffodilly and daffodil. Foxglove is the fox's-glew, or tintinnabulum, a ring of bells hung on an arched support. Bedstraw was a plant much used for couches before mattresses were invented, and a species which when dry yields a pleasant scent is still called lady's bedstraw. Carnation is coronation, its flowers being used as crowns or chaplets, just as campion is champion, gathered to crown the champions in a tournament. Cress is possibly from cross, its petals being cruciate; possibly from *crescere*, to grow, in token of its rapid increase. It was used in Chaucer's time, under the form of *kers*, to express any insignificant quantity.

"Of paramours ne raught he not a kers,"

from which comes, perhaps, the vulgar phrase "I do not care a curse," though a yet ruder parallelism has since been manufactured to confuse its spelling and its etymology. Nettle is from *ne*, to spin, indicating that its coarse fibres were used for thread in early times—an idea borne out by Hans Andersen's beautiful tale of the wild swats, in which you remember that the princess was permitted to redeem her brothers from their transformation by weaving them shirts of nettles. Shamrock is from an Erse word signifying the little trefoil. The story of its theological use by St. Patrick is of modern date, and it has been taken by various writers to represent the watercress, the wood sorrel, the Dutch clover, and the black medick. Irishmen are divided in the present day between the two last, which are sold on St. Patrick's day both in London and Dublin. The snowdrop is so called from its resemblance to the large eardrops worn by ladies in the sixteenth century, and represented often by painters of that period. The tobacco was the Indian name for the pipe in which the weed was smoked, not of the weed itself; and potato belonged at first to a tropical convolvulus, and was transferred by mistake to the well-known esculent. The gooseberry was the cross-berry, from its triple spine, which frequently takes the form of a cross. The hollyhock is the caulihock, hock being an old name for the mallow, to whose order it belongs, and cauli, meaning cabbage, either from its lofty cabbage-like stalk, or, as in cabbage rose, with reference to its rich double bloom. The laburnum closes its petals at nightfall like a tired labourer, and the osier is named from the oozy beds, which suit its growth.

I bring my list to an end, not because it is exhausted, but for fear my hearers should become so. I have picked only the most suggestive and curious of our many floral names, leaving an abundant gathering to many gleaners. One branch of the subject I have barely touched, the superstitious practices attaching to many of our wild plants, though not surviving in their names. I have left alone the interesting question of Bible plants, of the hyssop, the juniper, the mustard-seed, the lilies of the field, the burning bush, the shittah, the almug, the gopher, the curiously mis-translated cab of dove's dung, with the light thrown on their identity by the names given to them in the commentaries in our older translations. Nor can I do more than hint at the rich store of literary allusion to our wild flowers which abounds in all English poets, and the beautiful thoughts suggested to many of them by some particular plant. I should have liked to read you Chaucer's lines upon the daisy, Herrick's on the daffodil, Burns' on the dog rose, Shelley's on the sensitive plant, Southey's on the holly, Wordsworth's on the lesser celandine, Longfellow's on the compass plant. I should like to open volume after volume of Elizabethan and of later days—to enumerate and discuss the flowers with which Ben Jonson bids us "Strew, strew the smiling ground;" the "pretty paunce and chevisaunce" of Spenser; the "quaint enamelled eyes" that decked the laureate hearse of Lycidas; "the silver globes of guilder rose" which won the heart of Cowper; the "hawthorn bush beneath the shade" of Goldsmith's lovers; the "slight hairbell" which raised its head, uncrushed by the airy tread of Ellen Douglas. I should like to remind you of the lessons in natural theology which Paley drew from the "little spiral body" of the dodder seed; of the star-shaped shadow of the daisy which Archer Butler showed to Wordsworth, or how Linnæus, when he first saw the wild broom in flower—

* Lecture by Rev. W. Tuckwell before the Somersetshire Archæological and Natural History Society. *Gardeners' Chronicle* for September 22, from *Nature*.

"Knelt before it on the sod,
For its beauty thanking God."

Above all I should love to turn with you the page of Shakspere, to read of the grey discrowned head of Leaf wreathed with "rank fumiters and furrow weeds;" of Perdita at the shearing feast, disparaging the streaked gilliflowers as Nature's bastards; of poor distraught Ophelia distributing her rosemary and herb-of-grace; of Puck telling how love-in-idleness was purpled with love's wound; of Titania gently entwining the "female ivy and sweet honeysuckle" round the sleek smooth ass's head of Bottom; of Helena and Hermia, "a double cherry seeming parted, two lovely berries moulded on one stem." For I should lay on you a spell mightier than I can forge myself—I should invoke allies before whom we all bow as the source of our intellectual happiness and growth; I should remind you how the most creative minds have drawn nutriment from these tenants of our hedgerows and hill-sides, and how the knowledge of their lore helps us in its turn to interpret the sweet thoughts and apt illustrations of the poets they inspired and delighted: how, if the aspirations of my Cambridge botanist were fulfilled—if the daisy could become the *bellis*, the strawberry the *fragaria*, the honeysuckle the *caprifolium*, the the heather the *calluna*, the parting genius of romance and myth and association and folk-lore would be sent sighing from the domain of botany, and the richest and most attractive of the natural sciences would become the dullest and the most neutral.

In conclusion, let me disclaim all merit of originality in the ideas which have been put before you to-night. I have but attempted to bring together, with the interest attaching to cumulative illustration, conjectures which have been started and discoveries which have been worked out by others. Scattered through the old-fashioned tomes of Cole, Lyte, Parkinson—through the pleasant pages of Loudon, Pratt, Johns; above all, in the most valuable work on popular botany which we owe to our Somersetshire naturalist, Dr. Prior, you will find all or nearly all that I have advanced. The flowers were plucked by other hands; mine has been only the *pia dextera* to sort and wreathe them.

Parliamentary and Law Proceedings.

Prosecution under the Pharmacy Act.

At East Dereham Petty Session on the 9th inst. (the magistrates present being R. D. Crowne, Esq., and H. E. Hyde, Esq.), Mr. John Cock, chemist, Shipdham, was charged on the information of Superintendent Symonds, "for that he, on one day between the 23rd of August and the 2nd of October last, did sell by retail a certain poison, to wit, a preparation of poppies, made up in a compound called 'Syrup of Fox's Lungs,' the bottle in which the said poison was contained and so sold not being distinctly labelled with the name of the article and the word 'poison,' contrary to the form of the statute in such case made and provided." The prosecution was instituted under the Pharmacy Act, 31 and 32 Vic., c. 121, sec. 17, which provides that "it shall be unlawful to sell any poison, either by wholesale or retail, unless the box, bottle, vessel, wrapper, or cover in which such poison is contained be distinctly labelled with the name of the article and with the word 'poison,' and with the name and address of the seller of the poison;" and part 2 of Schedule A of the Act specifies "all preparations of poppies" as amongst the poisons, the sale of which is regulated by the statute under the conditions mentioned. It appeared that at the recent Winter Assizes for Norfolk and Suffolk held at Ipswich, William Cross, carpenter, Shipdham, and Emma Spilman, his housekeeper, had been committed to take their trial on the charge of the manslaughter of the infant son of the male prisoner, a child between five and six weeks old, its death having been brought about by the administration of an overdose of the "Syrup of Fox's Lungs." The prisoners were committed on the charge of manslaughter by the Dereham magistrates, as well as by the verdict of a Coroner's inquest held by Mr. Deputy R. T. Culley. On the case going before the grand jury, the bill was ignored so far as the magisterial commitment was concerned. By direction of the Court, however, the prisoners were formally arraigned on the Coroner's inquisition; but as no evidence was offered on behalf of the prosecution, a verdict of not guilty was recorded, and the accused were set at liberty. The present proceedings were the result of something which transpired during the progress of the Coroner's inquest.

In stating the case to the Bench, Superintendent Symonds said that he now proposed to show that the ingredient which had caused the death of Cross's child was purchased at the defendant's shop, without being so labelled as to indicate its dangerous character. Had the defendant, instead of justifying the sending it out in the manner complained of, expressed his regret for so doing, and said it should not be repeated, he (the Superintendent) would not have pressed for more than a nominal penalty; but as he had not done that, he felt it his duty to leave the case to be dealt with by the magistrates as the evidence to be laid before them might seem to warrant.

The first witness called was Emma Spilman, who deposed that once or twice a week during the time the child had lived, she sent to the defendant's for a quantity of "Fox's Lungs," and that on no occasion had the bottle been marked with the word "poison" or anything whatever on it beyond the words, "Fox's Lungs.—Cock, Chemist, etc., Shipdham." The bottle produced was that out of which the syrup was taken and given to the child before its death.

The witness was cross-examined by the defendant as to whether she had not had several illegitimate children, with the object of invalidating the reliable character of her testimony; and on being re-examined, she said that had the word "poison" been on the bottle she would not have given the medicine in such quantities as she did.

Ellen Hall, nine years of age, a step-daughter of William Cross's, deposed that she went for the syrup by direction of the previous witness, and that the word "poison" was never put on it, nor anything more than as now produced in court; and that the last time she went for the syrup it was supplied by the defendant's daughter.

Superintendent Symonds deposed that in a conversation he had with him on the subject of sending out "Fox's Lungs" without being marked "poison," the defendant said that it would not answer his purpose to do so, as in that case he should not sell anything of it; to which witness made answer, "That (their protection) is just what the public require."

In defence, Mr. Cock called Esther Eke, widow, and Keziah Able, an unmarried woman, two neighbours of the father of the deceased child, and they deposed to having seen a bottle at his house like the one produced, and, besides the white label upon it, with the defendant's address, it had also a red label marked "poison;" but neither of the witnesses would undertake to swear that the bottle they saw was the identical one in court.

At the conclusion of his witnesses' testimony, Mr. Cock addressed the Bench, in the course of which he said that his daughter (who had not been called) was exceedingly careful, even unnecessarily so, in not sending out any quantity of "Fox's Lungs" without labelling it "poison;" and in the present instance that was confirmed by two witnesses. If the red label so marked had been removed from the bottle before the holding of the Coroner's inquest, it was very hard that he should have to suffer for it. The charge, he had no doubt, had its origin in personal spite; and in assuring the Bench that during the twenty-four years he was in business no one could be more strict than he was, he trusted that would save him from the consequences of a conviction on a charge made against him from a paltry motive.

The Chairman, in announcing the decision of the Bench, said that they regarded the defendant's conduct as so reprehensible that they had determined to inflict the full penalty of the law. Not only was his conduct reprehensible, but it was most unmanly, inasmuch as he had attempted to hoodwink the magistrates by the way in which he had referred to the character of one of the witnesses for the prosecution. To mark their sense of what the Bench thought of that, he (the Chairman) begged to tell the defendant that they believed every word which they had spoken, while they did not believe his witnesses. The defendant would be fined £5, and £1 10*s.* costs, or one month's imprisonment. The money was paid.

Before leaving the court, Mr. Cock made sundry efforts to address the magistrates in complaining of the severity of the decision, and made some allusion to his daughter; but the only notice taken of it was by Mr. Hyde, who told him that for her acts in selling medicine the law held him liable.—*Eastern Daily Press.*

[*** We think it right to call attention to the fact that the justice of the above decision is challenged by Mr. Cock, for the reasons given in a letter that will be found on p. 500.—Ed. Pharm. Journ.]

Poisoning by an Embrocation.

On Monday last Dr. Diplock held an inquest at Kensington Dispensary, Church Street, Kensington, on the body of Emma Healey, 45 years of age. The deceased was housekeeper at the dispensary. For some time she had been suffering from rheumatism, and for this complaint used an embrocation composed principally of opium, ammonia, and belladonna. A woman named Chinnick, who had lately attended to deceased's duties, said that on Tuesday she took the embrocation bottle, which was labelled "poison" from deceased's room, as she appeared "strange" and "queer." Witness hid the bottle in the kitchen. The bottle was afterwards discovered in deceased's bedroom, where she was found to be insensible. Deceased died on the following day.

A *post-mortem* examination revealed that death was due to poisoning, combined with extensive lung disease. Deceased had been in a lunatic asylum, and a relative of hers died from insanity.

After a long deliberation, the jury returned a verdict of death from misadventure, considering that deceased had mistaken the bottle of embrocation for another.

Review.

Histoire des Drogues d'Origine Végétale, par F. A. Flückiger et Daniel Hanbury; Traduction de l'Ouvrage Anglais 'Pharmacographia,' Augmentée de très-nombreuses Notes, par le Dr. J. L. de Lanessan. Avec une Préface par H. Baillon; et 320 Figures dessinés pour cette traduction, par L. Hugon. Paris: Octave Doin. 1878. (2 vols. 8vo., pp. 668, 672.)

Three years have passed since the appearance of the great work 'Pharmacographia' gave to English students one of the most perfect scientific treatises ever written, and afforded a new starting point for the study of vegetable drugs. Its originality, careful accuracy, and laborious honesty of method, placed it in an almost unique position in a day of rapid book-making, wholesale copying, and unacknowledged quotation at second hand. Such a book was certain to be widely appreciated wherever science is followed, and it is with pleasure that we now see it translated into French. Its high qualities are fully recognized by Professor Baillon in his preface to the volumes, where he gives eloquent expression to his sense of them and to his regret at the premature death of the learned and conscientious man to whom pharmacology throughout the world owes so much.

Probably the first thing that will strike any one who is familiar with the original, is the much greater size of the French edition; the single volume has expanded into two. But in fact there is in the work much more than a translation of 'Pharmacographia.' Dr. de Lanessan's object has been to render the treatise suitable as a text-book for students at schools of medicine and pharmacy, and with this view he has intercalated a large amount of additional matter. Thus we find botanical descriptions of the genera and species named, full histological descriptions of most of the drugs, and the addition of a good number of fresh substances, and there are numerous illustrative woodcuts. All this no doubt in a sense renders the book more complete, and Professor Baillon claims for the editor that he has made it a new work. Without denying this, we are yet unable altogether to feel reconciled to the altered character of such a book as 'Pharmacographia,' which we are inclined to look upon as a classic not to be lightly interfered with. It is true that the text is left intact and all the additions printed in small type, but the homogeneity of the book is destroyed; for it is no disparagement to the French editor to say that his additions do not bear the stamp of the original. Had the plan of this included botanical descriptions we may be very certain that the authors would have been satisfied with nothing short of completely new ones drawn up with care from the plants themselves in all cases, and that errors in synonymy, such as putting two such different plants as *Narthex* and *Scorodosma* under one species, to which, moreover, it cannot be conclusively shown that either belongs, would have been avoided.

Among the additions are Simaruba, Jaborandi (referred to *Pilocarpus pennatifolius*, Lem.), *Eucalyptus globulus*, *Gelsemium*, *Erythræa*, many *Ranunculaceæ*, etc., but there are still many vegetable drugs not treated of, and it was, we think, scarcely well to substitute for the accurate second title of the English volume—"a History of the Principal Drugs of Vegetable Origin met with in Great Britain and British India,"—the comprehensive one given above; for example, there are many much-used American remedies unnoticed. The figures of the plants are too small to be of much service, and the space they occupy would have been better filled by a full quotation of the existing figures and of references to descriptive or geographical works. But Dr. de Lanessan quotes scarcely any one but Professor Baillon. The latter is strictly followed in all taxonomic matters, and the sequence of the plants and in some cases their names have been altered in accordance with his views. Several unfamiliar couplets resulting from this are here, we think, first published. *Delphinium Napellus*, Baill., *Helleborus Tecta*, Baill., are examples.

The most important of the new portion, however, is found in the excellent descriptions of the minute anatomy of the drugs, which have been prepared with evident care; the illustrative figures are also very satisfactory and help to render this part of Dr. de Lanessan's work a very useful contribution to pharmacological knowledge.

The translation is, so far as we are competent to judge, an able one, and has had the great advantage of the supervision of one of the authors of the original, Professor Flückiger, who has enriched it with occasional notes, so that to a certain extent it may be regarded as a new edition in another language. The book is very well printed and possesses an unusually good index.

Obituary.

Notice has been received of the death of the following:—

"Alexander Gow, of Wolverhampton. Died December 10, 1877. Aged 78 years."

Such is the simple record of the end of one who prosperously conducted the duties of a pharmaceutical chemist on the same business premises for nearly half a century, and was looked upon as the Nestor of the local trade. Mr. Gow was one of the founders of the Pharmaceutical Society, and treasurer to the Wolverhampton Chemists' Association, in the success of which he took a lively interest. He was a man of sterling business qualities, and his superior intellectual and professional attainments won for him the confidence and esteem of the local medical practitioners and his brethren in the business. In private life his genial kindly disposition and his inexhaustible fund of joke and anecdote made him a favourite with all classes. Mr. Gow died from injuries caused by a severe fall. Some of the members of the trade accompanied him to his resting-place at the Wolverhampton Cemetery, and many of the houses of business were closed during the funeral.

On the 30th of November, 1877, Mr. Joseph Goddard, Pharmaceutical Chemist, Stoneygate, Leicester. Aged 64 years. Mr. Goddard had been a Member of the Pharmaceutical Society since 1842. For many years he carried on the business of a chemist and druggist in Gallowtree-gate, Leicester, now in the hands of Mr. Young, and he was well known to the trade as the manufacturer of Goddard's plate powder.

On the 19th of July, 1877, Mr. Charles Fielding Palmer, Pharmaceutical Chemist, Islington, Birmingham. Aged 55 years. Mr. Palmer had been a Member of the Pharmaceutical Society since 1853.

On the 23rd of July, 1877, Mr. George Cobden Sidgwick, Chemist and Druggist, Bishopswearmouth. Aged 37 years.

On the 4th of September, 1877, Mr. Edward Ashwell Burnham, Chemist and Druggist, Osmaston Street, Derby. Aged 37 years.

On the 31st of October, 1877, Mr. Robert Royse' Chemist and Druggist, Stockport. Aged 47 years.

On the 13th of November, 1877, Mr. James Larkworthy, jun., Chemist and Druggist, Isleworth. Aged 48 years.

On the 14th of November, 1877, Mr. John Windross, Chemist and Druggist, Salthouse Lane, Hull. Aged 38 years.

On the 22nd of November, 1877, Mr. Hugh E. Gilbert Symmons, Chemist and Druggist, Milford Haven. Aged 34 years.

On the 24th of November, 1877, Mr. Francis Snelling, Pharmaceutical Chhmist, Stockwell. Aged 70 years. Mr. Snelling had been a Member of the Pharmaceutical Society since 1842.

Dispensing Memoranda.

[44]. I think the translation of "℥j bis 7 mana" means an ounce to be taken twice a week, and T. H will probably find this correct.

J. W. B.

[44]. In answer to query No. 44, my translation is—Two tablespoonfuls to be taken twice a week. ℥j bis Septimana."

[45]. What is the best "modus operandi" in mixing the following?

Ext. Belladonnæ . . . . ʒiss.
Ol Hyoscyami . . . . , ... ℥j
M. Ft. Linimentum.

Would it be justifiable to add a little mucilage, as I found a little difficulty to get them to combine?

J. W. Barnes.

[46]. Ung. Galeni.—I have to dispense the following:—

℞ Ung. Hyd. Nitrici Oxydi . . . . . ʒij.
Ung. Galeni . . . . ʒij.

M. To be applied to the edges of the eyelids. Can a correspondent give me a form for ung. galeni?

Apprentice.

[48]. Please inform me which preparation would be correct to use in the following prescription, Hyd. Sulphat. or Hyd. Lak. Sulph. (Turpeth Mineral), B. P.:—

℞ Potassii Iodidi . . . . . ʒj
Hydr. Disulph. . . . . . ℈j
Ung. Cetacei. ad. . . . . ʒj.
M. ft. Ung.

T. H. M.

[49]. Can you kindly inform me through the medium of the Journal how to make a perfectly clear mixture of the following prescription:—

℞ Liq. Ferri. Mur. . . . . . ʒij
Liq. Ammon. Acet. . . . ℥iv
Sp. Chloroform. . . . . . ʒij
Aq. ad . . . . ℥viij.

H. J. H.

[50]. Extractum Ergotæ Liquidum.—I emptied a bottle the other day in which extractum ergotæ liquidum B.P. had been kept for a month or two. The extract had deposited a good deal, and I was proceeding to clean the bottle before refilling it, when I was a little surprised to find the bottom of the bottle covered over with small crystals.

Not having before heard of any crystalline substance existing in ergot, I thought that by writing to you, you might be able, through the medium of the Journal, to give me some information regarding it.

The crystals occur in transparent prisms about from one to three lines in length, and are evidently sparingly, or not at all soluble in water.

I have not been able to get any of them out of the bottle to examine them more minutely, as I do not wish to destroy them. "A Young Pharmacist."

Notes and Queries.

[564]. COFFIN'S COMPOSITION POWDERS:

Bayberry . . . . 4oz.
Pinus Canadensis . . . . 2oz.
Ginger. . . . . 2oz.
Cayenne . . . . ¼oz.
Cloves . . . . ¼oz.

All finely pulverized and well mixed. Ordinary dose, a teaspoonful in a cup of hot water sweetened. Or,

Bayberry . . . . 4oz.
Pinus Canadensis . . . . 4oz.
Ginger . . . . 4oz.
Golden Seal . . . . 2oz.
Sassafras . . . . 2oz.
Cayenne . . . . ½oz.
Cloves. . . . . ½oz.

The above copied from Dr. Coffin's 'Botanic Guide to Health.'

Rothesay. A. Macintosh.

A similar answer has been received from "*Hyacinth*."

[564]. COMPOSITION POWDER.—The form for Dr. Coffin's Composition Powders is—

Cayenne . . . . ¼ oz.
Cinnamon and Cloves, of each . . 1 oz.
Ginger and Poplar Bark, of each . 4 ozs.
Bayberry . . . . 8 ozs.

One-half a teaspoonful in a cupful of warm water.

W. R.

[565]. WHITE FULLERS' EARTH.—In reply to "Tenens," I would say that I have known several instances in which kaolin or china clay has been sold as White Fullers' Earth. It is in my opinion a better absorbent than fullers' earth for irritable surfaces, especially to prevent chafing in young children. Only the pure washed clay should be used.

JOHN LINFORD.

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[566]. LIQ. COPAIB. C. CUBEB. ET BUCHU.—Can any one give me the formula Liq. Copaib. c. Cubeb. et Buchu?

CHEMICUS.

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[567]. YORKSHIRE BLACK OILS.—Will any reader please give me a recipe for Yorkshire Black Oils?

A. P. S.

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[568]. WOOD STAIN.—Will any reader furnish me with a good recipe for a slate colour stain for wood, and oblige?

J. O. SLIPPER.

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[569]. OIL OF STAVESACRE.—Can any reader supply useful formulæ for utilizing the oil of stavesacre as an external application? There were none given in Dr. Squire's paper.

W. S.

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[570]. TINCTURE OR SPIRIT TO BURN IN A PERFUME LAMP.—Can any reader give me a form for the above, or tell me where there is a good one?

INCENSE.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

ADMISSION OF WOMEN, ETC.

Sir,—Clap-trap seems to be a disease of the zymotic class; it survives despite the vigorous treatment of common sense to extirpate it.

This peculiar disease of society has taken the form for some years past of "Women: their rights and grievances in general.". There is no other country on the face of the earth where they are more loved, favoured, and protected than ours. It is a free country, and there is no Act of Parliament by which they are prevented from doing anything in particular or all things in general.

I think that the proper sphere and office of women is the direction of the domestic menage, and if they would only devote their energies to raise the standard of home influence and home comforts, to diffuse more knowledge concerning and better results in this respect, many spinsters would soon be married and the race of bachelors soon become extinct; we should hear no more of grievances and every one would be all the better for it.

Concerning the advisability of admitting women as members of the Pharmaceutical Society, *per se*, I will offer no opinion; it does not much matter either way. I will only say in regard to it, how many chemists think of bringing up their daughters to it? I think very few, or their sons either, and they surely must be the best judges.

I should suggest, as a solution of the difficulty and to promote the "early closing" of the discussion, that our respected Registrar should be instructed to affix some distinctive mark against those chemists who are bachelors, with some indication as to whether they would be induced to take compassion on any lady who desires admission to the Society, and if after marriage they still feel anxious to enter and qualify themselves (or we might I think, in justice, place them on the register without examination) then by all means admit them to the Society.

At present they enjoy all the advantages without any of the trouble or difficulties.

HENRY LONG.

48, *High Street, Notting Hill, London,*
December 1, 1877.

Sir,—If "female persons" are eligible to become chemists and druggists they are equally eligible to be elected members of Council and even to fill the presidential chair.

Imagine the Pharmaceutical Society of Great Britain under the supreme sway of an elderly female person!

Is the business of the thousands who are doomed to a life of unremitting toil so inviting, so lucrative, and so short of hands that it requires reinforcement from the ranks of female persons who cannot hit upon a more feminine occupation?

I know of three instances wherein petticoats were admitted to an equal share in the management of drug businesses. The first was sister-in-law to the proprietor, the second and third were widows of deceased chemists; and I can positively state that their presence behind the counter tended to make the reverse of a "little heaven below." Occasionally coarse fellows of high or low degree would come out in a way that caused female modesty to tremble and youth to blush.

One lady eventually retired from public life and made herself generally useful in putting up fancy articles, seidlitz powders, etc., for which her neatness and industry rendered her particularly useful.

The third lady was married to her assistant in self defence, then made her courtesy and backed out.

ANTIPATER.

P.S.—Would it not be as well to be looking out for our general interests as regards legislation which threatens the destruction of our body?—A. P.

Sir,—How much longer are the pages of our Journal to be the platform for the verbose discussion on the vexed question of the admission of females into the Society? Why such a platitude of argument on a subject requiring none? The whole matter lies in a nutshell. It has been brought before a general meeting of the members, and I remember some gentlemen expatiated on the intellectuality of women. Another wanted to take a case to the Queen's Bench to test the legality of their admission. But, sir, it is neither a legal nor an intellectual question. Women have been made M.D.'s, and therefore we must admit their capacity to become pharmacists.

But I presume we have a right to form our own rules, and this question has been most distinctly put before the members, and they have as emphatically said "No." What more is wanted, and what the use of continuing week by week the discussion of a question already settled?

FREDERICK TIBBS.

81, *Chalk Farm Road, Dec.* 1877.

DOCTORS *v.* CHEMISTS.

Sir,—While the vexed question of prescribing is pending, which seems a difficult problem for judges, lawyers, and everybody else connected with it to solve, I think it a very opportune time for pharmacists to improve their position. We all know that the Pharmaceutical Society endeavours to impress on its members that prescribing is not within their limits, but still we must remember that there are several of our poorer members who, from sheer necessity to make both ends meet, are compelled to prescribe a little, as they are generally placed in neighbourhoods where they do not see even the apparition of a prescription from one week's end to another, consequent on the doctors dispensing their own medicines. Supposing that little prescribing is taken away from them, the question arises, what is to be done to recompense them for the loss? Why did England, through her Parliament, pass the Pharmacy Act? Namely, that a chemist should be a man educated in the knowledge of drugs and chemicals and compelled to pass stringent examinations in order that he might be considered a competent man to be entrusted with the dispensing of doctors' prescriptions, so that the safety of her people might be ensured. Alas, many a poor chemist has to go through the ordeal of those examinations, not for that purpose, but only to sell such things as "a pen'orth of cipity powder," as the poor people term it, as the doctor monopolizes all the dispensing of medicines himself.

The proposition I suggest is, not to go against the doctors but to work with them. Why not have a conference composed of delegates chosen by the medical profession and the Pharmaceutical Society to decide what each may give and take? Let us offer to discountenance the practice of prescribing over the counter in every shape and form, on condition that we alone are invested with the sole right of dispensing medicines. If a doctor prefers to dispense his own medicines compel him to comply with our regulations of examinations, and the same with the chemist who wishes to prescribe, and let every offender of either body forfeit his diploma, and not merely be mulcted. At the same time the subject of quackery by the sale of patent medicines might be discussed. If a chemist wishes to prepare a medicine, allow him to do so, and retain the sole right of preparing it on condition that he submits to a council, appointed by both bodies, the formula of such medicine, not for publicity, but merely to show that no poison forms an ingredient of it. Poison should only be administered by a doctor's prescription.

By such a course the safety of the public will be ensured, as it will prevent them from making fatal mistakes by obtaining a poison under the colour of a patent medicine, which anybody who obtains the patent medicine licence can now sell, be he chemist or not. Over-zealous mothers and nurses will then be prevented from administering narcotics in the shape of soothing syrups, teething powders, etc., to young children, and thereby ruining their constitutions for life. If a chemist has a branch establishment it ought to be compulsory for him to employ an assistant, possessing at least the Minor qualification, as manager of it, and not to leave the dispensing of medicines to incompetent persons in such cases, which I am sorry to say occurs often.

If the medical profession refuse to meet us, and the Apothecaries' Company continues to delight in ruining chemists, and endeavours to stamp them out, then as a last resource let all the chemists of the United Kingdom sign their names to petitions placed in the hands of our zealous local secretaries, and under the banner of "Union is strength" appeal to Parliament next session for the exclusive right of dispensing medicines for which it has compelled us by the Pharmacy Act to make ourselves competent. I know that it will be a difficult task to teach the public that their chemists may not prescribe for their slight ailments, but it will be soon found out if the chemist and druggist tells them that it is as much as his diploma is worth to do it.

I am afraid many of my *confrères* will think that I am suggesting very stringent measures but I am sorry to say that I think it absolutely necessary to prevent us from overstepping our bounds. In conclusion, I hope that having broached the subject other gentlemen will more ably take up the discussion, and that it will ultimately lead to a mutual union of the medical profession and pharmacy, and that a chemist's anomalous business may soon become the long looked for profession.

ARTHUR GEORGE RICKARBY.

Walton-on-the-Naze, December, 1877.

COUNTER PRACTICE.

Sir,—The hairdresser, if my hair is coming off or there is any disease of the scalp, examines my head and prescribes ointments, lotions, or sometimes a little quinine or iron internally.

The dentist examines my teeth and gums and general state of my mouth, performs operations, prescribes lotions, liniments, etc., and frequently medicine to be taken internally.

The chiropodist examines my feet, performs operations on corns, etc., and treats diseases of the feet generally.

The "bone-setter" proceeds to examine and criticize the work of the surgeon, and, if there is any abnormal adhesion, performs an operation to set it right.

The nostrum maker, by a general sweep, prescribes like the apothecaries a secret remedy for any, whole Pandora's box and pills.

And now the chemist, the only person specially exempted from the fierce provisions of the Apothecaries Act, is being prosecuted for giving a gargle to a man with a slight sore throat. I ask you, with these facts before us, in the name of common sense, why is the Pharmaceutical Council proposing to fund surplus money, when a greater number of chemists than the Society itself contains are subscribing to defend not their rights only but the common liberty of the subject? If we quietly submit to that, we shall be improved off the face of the earth, and the building in Bloomsbury Square will be an eligible monument, if before we go we let our splendid "freehold" house as the western branch of the Apothecaries' Hall.

GEORGE MEE.

W. Phillips, *A. J. Lewis*, and *M. P. S.*—The statemente in your letters are no doubt consistent with facts which arr sure to receive consideration in all their bearings wheneves the subject referred to comes before the Court, and as this may take place shortly, as well as for other considerations, we do not consider it advisable at present to prolong the discussion in these columns.

PROSECUTION UNDER THE PHARMACY ACT.

Sir,—Will you kindly place the following facts in your next Journal, and elicit the opinion of the members of the trade whether such oppression is to be allowed to pass by unnoticed, and also kindly give me your opinion as to what you think could be done in the case:—A case of alleged manslaughter from starvation came before the Ipswich Quarter Sessions, where in addition a bottle containing two penny-worth of Syr. Poppies was produced, and it was shown that this drug was used to quiet the infant when it should have been supplied with food. When the bottle was shown in court it was labelled with the name of the article, but not the word "poison."

A summons afterwards was issued to me as supplying the article. I appeared to meet the charge, and took with me two respectable witnesses that could swear that they saw two labels on the bottle a day or two before the inquest, the name of the article, and a red label with the word "Poison" distinctly placed below the other. In the face of all this the magistrates fined me the highest penalty they could, £5 and 30s. costs. No one is safe therefore even if labelled properly, unless he can follow the bottle, and see the label is not removed, and this evidently was.

JOHN COCK.

Shipdham, December 12, 1877.

[**** A report, taken from a local newspaper, of the case referred to in the above letter, will be found on p. 496.]

A. Graham.—Apply to Messrs. A. Bel and Co., Maiden Lane, Strand.

"*Occidens.*"—(1) *Ceratodon purpureus*; (2) *Hypnum Swartzii*; (3) *Neckera crispa*; (4) *Leskea sericea*; (5 and 6) Forms of *Rosa canina*: we cannot undertake to name varieties of roses.

A Plymo-Student.—No.

E. R. G.—We believe the name is applied to a preparation sent out by Messrs. Corbyn, Stacey and Co.

Edinburgh Assistants' Supper.—Mr. W. J. Clarke writes to say that in referring to the founders when proposing the toast of the North British Branch he omitted through forgetfulness to mention the names of the late Mr. John Macfarlan and of Mr. H. C. Baildon who has on two occasions been President of the Branch.

A. Laitram and *D. B. Dott.*—We agree with you in thinking that the adoption of the metric system would be very desirable, but the obstacle is precisely the same which has prevented the old apothecaries' weight being superseded, and as yet no adequate means of overcoming that obstacle have been devised.

Mr. T. J. Barrett is thanked for his communication.

"*Apprentice.*"—Apply to the Secretary, 17, Bloomsbury Square, for a copy of the Regulations of the Board of Examiners.

COMMUNICATIONS, LETTERS, etc., have been received from Professor Flückiger, Professor Landerer, Mr. Severs, C. H. A.

"THE MONTH."

Already the glossy dark green holly, profusely covered with its scarlet berries, and the favourite mistletoe with its lovely pearls, are being poured by waggon loads into the great city, and the poorest home no less than the palatial residences of the rich will soon be brightened with the presence of the conventional sprig of holly and spray of mistletoe.

Flowers are now but few and far between, and there are none of medicinal interest to be seen in blossom, save that which, from its time of blossoming and its shape, has been appropriately called the Christmas Rose (*Helleborus niger*). In the country districts of the South of England the fragrant blossoms of the winter heliotrope (*Petasites fragrans*) are beginning to perfume the frosty air, and in spite of rain, or even snow, make the passer-by sensible of their presence.

In the conservatories of the rich the fashionable *Poinsettia* relieves the monotony of green foliage with its brilliant scarlet (petaloid) bracts and its singular flowers. Although not a medicinal plant it belongs to an order which yields many plants used in medicine (Euphorbiaceæ), and on account of its size and of its occurring at a time of year when no wild plants of that order are in blossom, it is worthy of a brief notice.

Each little cup-like flower consists of about five united bracts, which are combined to a pink fringed involucre, on the outside of which may be seen one or more yellow narrowly cup-shaped glands. If the involucre be carefully removed, there will be found inside it five rows of what at first sight appear to be stamens, but which are in reality male flowers, each consisting of a divergent two-celled anther crowning a short scarlet filament, which is placed upon a white pedicel of the same size and shape; at the base of the pedicel of each male flower is a minute hairy palea or bract, and in the centre of the stamens may be found a single female flower, which is not usually developed until most of the stamens are mature.

The top stamen of each row is first raised above the involucre, and as it matures it falls off the white pedicel at the point where the scarlet filament is jointed to it, and each stamen is then succeeded in turn by those below, so that the apparent flower is really an umbellate cyme, consisting of a large number of deciduous male flowers, and one female flower, neither having any trace of calyx or corolla. The stalk of the female flower afterwards elongates very considerably, and raises the characteristic tricoccous fruit above the involucre.

But our old friends the holly and mistletoe deserve somewhat more than a passing notice. The leaves of the holly have been stated to be almost as good as cinchona bark in the treatment of intermittent fevers, and their juice has been recommended in jaundice. The root and bark are also believed to possess deobstruent, expectorant, and diuretic properties, while the berries are supposed to be purgative and emetic in doses of six or eight. Certainly they would form elegant pills, and might prove useful after Christmas festivities. The white wood is much used for inlaying. The young stems dried, according to M. J. Pierre, are given to cattle, from the end of November to April, in Morbihan, and are found to be wholesome and productive of good milk. This statement, however, scarcely accords with the common belief that the lower leaves of the holly only are spinous, so that the cattle should not browse upon the foliage and injure themselves. Although the medicinal properties of the holly do not appear to be clearly understood, it is certain that a relative of the plant, the *Ilex paraguayensis*, furnishes a tea which is highly appreciated in South America, and contains theine. The term spinous is applied to the holly leaves with doubtful correctness, (the term spine being synonymous with thorn according to many botanists,) for in this case the points are formed chiefly from the hardened epidermis which is inrolled at the margin of the leaves, and have therefore more resemblance to a prickle.

The holly has also its economical uses. The middle bark, under proper manipulation, yields birdlime, which, however, may also be obtained from the mistletoe. The Japanese find some curious uses for this substance. Traps for rats are made in the simplest possible manner, by placing pieces of board or card smeared with it near their holes. Spread upon bamboo leaves it is used for catching flies and other insects. Even fleas are no match for Japanese ingenuity, for they are trapped in bed by birdlime spread on pieces of board, the board being arched over with bent bamboo to prevent the birdlime from adhering to the bedding. Possible uses of this viscid article, such as a snare for cockroaches, mice, etc., will at once suggest themselves to our readers Even animals as large as monkeys are caught by its means in Japan. Ornithologists may take a hint as to bird catching from the Japanese method. Long stems of *Wistaria* are smeared with birdlime and floated out in estuaries, and even on the sea, in parts frequented by birds, and wild fowls are in this way bagged in considerable quantities. Many other uses are given in an interesting report on this subject from Mr. Consul Annesley.

If the holly needs to be protected from animals lest it should injure them, much more does the yew tree, as was lately discovered by the Chesham Burial Board, which had to pay £20 damages for not keeping the branches of a yew tree within the bounds of the cemetery. A horse belonging to a veterinary surgeon in the neighbourhood being turned into a field close to the cemetery to graze, browsed on the leaves of the tree and died. It appears that in the legal report it was specially remarked that it was an unconsecrated cemetery, and the *Gardeners' Chronicle* suggests that possibly the writer supposed the yew derived its noxious properties from that damnatory fact! It might have with equal sarcasm further suggested that the soil of the unconsecrated burial ground should have been analysed before the trial.

The medical journals supply very little matter of pharmaceutical interest this month. Hydrophobia still continues to excite attention, and various remedies continue to be suggested. It is interesting to find what varied treatment is used in different districts and countries, and it is instructive to notice how much hidden knowledge can be brought forward when any difficulty excites the attention of the medical public. Were all medical men and pharmaceutists equally liberal minded in publishing the results of their experience both medicine and pharmacy would make more rapid progress than is at present the case.

In the *Chicago Medical Journal* a correspondent recommends as a remedy for violent griping caused by excessive peristaltic action, occasional teaspoonful doses of a solution made by adding a tincture of colocynth to water in sufficient quantity to render it bitter. The homœopathic dose so given is stated to have an excellent sedative effect. If this be true it affords another instance of the fact that some medicines when given in minute quantities produce exactly opposite effects to those following their administration in large doses. Experiments with regard to this peculiarity, might, if made with some of the more potent drugs, reveal that there is much more foundation in fact for the practice of the modern homœopath than is generally supposed.

Glycyrrhizin appears likely to become an important article in elegant pharmacy. It is attracting considerable attention as a means of disguising the taste of bitter and nauseous remedies. Dr. L. Curtis has found that one grain of glycyrrhizin will disguise the taste of one grain of quinine suspended in a drachm of syrup. Probably its use in the form of a lozenge or wafer previous to taking a dose of medicine would answer the purpose equally well.

From *L'Union Pharmaceutique* we learn that St. Martin has proved by careful analysis that glycyrrhizin exerts no influence on the formation of glucose in those suffering from diabetes, and that it may be recovered from the urine in an unchanged condition. The diabetic patient, therefore, may now have gluten biscuits made sweet and palatable without danger.

Curara still continues to attract attention, and it is announced that gelatine discs are being prepared by Messrs. Savory and Moore. As the solution is apt to spoil by keeping, and the discs will keep indefinitely, and are easily soluble in a small quantity of water, they are likely to take their place with those of calabar bean and atropine.

According to the *Lyon Médicale*, sulphate of atropine, in granules containing half a milligramme, given for eight or ten days at intervals varying according to circumstances, has been found very valuable in subduing the excessive perspiration in phthisis, etc.

Dr. Martin in the *Boston Medical and Surgical Journal* describes a new form of plaster which he has invented to supersede ordinary adhesive plaster. It is formed by incorporating Para caoutchouc and Burgundy pitch with a small proportion of balsam of tolu. This mixture is spread on a strongly woven cloth. A sticking plaster which will not cause irritation, which will adhere well, and which will perform its guarantee "not to wash off," is certainly a desideratum, and if this method succeeds it will doubtless be rewarded with commercial success. The Japanese have already solved the difficulty by the very simple plan of spreading birdlime on paper or cloth, or silk, and applying it to wounds or cuts, which it is stated to heal rapidly. It may not be generally known that birdlime can be dried and powdered, and will regain its properties when moistened. The properties of this substance certainly deserve examination from a surgical point of view, and its portability and easy application might permit of its forming a portion of the kit of every soldier, and its use might to some extent prevent such harrowing scenes as have been described as occurring in the Turkish war, when doctors have not been procurable for several days together.

The *American Journal of Pharmacy* contains a paper on hops, in which the author, Mr. E. G. Bissell, comes to the conclusion that the bracts contain no narcotic property and that the tannin contained in hops is neither gallotannic nor moritannic acid.

While Messrs. Senier and Lowe have been experimenting in this country, on the colour of podophyllin, Mr. G. H. C. Klie in America has tried the effect of alcohol of different degrees of specific gravity and finds that root exhausted with alcohol of sp. gr. ·930 gives the largest amount of precipitate, the liquid used to precipitate it being half an ounce of alum to four pints of water, and the next largest amount is obtained by the use of alcohol of sp. gr. ·938, the precipitant being water containing half a drachm of hydrochloric acid to each pint. The colour of the precipitate appears to have varied in each experiment, and it was found that in no case was the product entirely soluble in spirit of the same strength as that from which it was precipitated. It would thus appear to undergo some alteration by precipitation. It is evident that the subject of podophyllin resin is as yet by no means exhausted.

Messrs. Gehe and Co. of Dresden, in their commercial report, convey much interesting information. Alluding to the complaint made some time ago of the presence of ammonia in some specimens of subnitrate of bismuth, they attribute it to the fact that bismuth as well as zinc decomposes water in the presence of nitric acid, and thereby brings about the conditions necessary to the formation of ammonia. Salicylic acid is being largely used in Germany for preserving ale in good condition, and is becoming quite an important manufacture. Crystallized copaivic acid, a form in which that article has not yet been introduced into this country, seems to have been in demand during the past few months.

Messrs. Gehe report also that some samples of Persian opium recently imported are particularly rich in codeia, containing as much as 1·4 per cent. Hydrochlorate of pilocarpine is in great demand, and cotoin continues in high favour. It is singular that this remedy is so little used in this country. In Germany it appears to be used chiefly in those cases of diarrhœa in which opium cannot be safely or conveniently used.

Inulin is being tried as a remedy for diabetes mellitus. It would be very remarkable if this substance, so nearly allied to starch, should prove to be a remedy in this disease, or even be capable of use in food for diabetic patients. Pancreatin capsules will probably soon have to give way to more elegant and pleasant forms of administration; it is likely to be offered in the market shortly in the form of a greenish powder.

Artificial vanillin, which some time ago attracted considerable notice, appears to be a failure from a commercial point of view. It soon loses its delicate perfume, whereas that obtained from vanilla, being associated with an aromatic resinous substance, appears to be much more lasting. Whether the body which is present in the natural state has a retarding action in preventing further change in the vanillin does not appear, but from the fact that vanillin belongs to a group of bodies (aldehydes) which are very prone to change, it is quite possible that it would alter more rapidly in the pure state.

The Colorado beetle panic seems to have died out, with the approach of cold weather. Unfortunately this beetle is not the only rapacious insect injurious to cultivation. During the latter part of last year the valuable plantations of cinchona trees in Java suffered a great deal from the ravages of an hemipterous insect, *Heliopeltis theivora*, the same insect which infests the tea plant. Both the adult and the young insect feed on the sap of the young leaves and bark, which they pierce in a number of places. As the uninjured part of the plant grows, the leaves and young twigs acquire an irregular and twisted appearance. Curiously enough, the insect only attacks cultivated plants, such as tea, stramonium, fuchsias, etc., and is not known to attack plants indigenous to the island. The only means hitherto found successful in limiting its devastations have consisted in removing and burning the injured parts, and in preventing the destruction of insectivorous birds. The Dutch Government have ordered a million more cinchona trees to be planted in the island. The whole of the valuable Ledger bark produced in that island has hitherto been bought up at Amsterdam by quinine manufacturers, so that at present it cannot be said to have come into the retail market, in which it may be hoped the increased cultivation will soon enable it to take an important place.

In some remarks in the *Bulletin General de Thérapeutique*, on the ergot of wheat as compared with that of rye, Dr. Estachy concludes that the action of the former is identical with that of the latter.

'Medicinal Plants' for this month contains figures of the following plants:—*Aconitum ferox* and *A. heterophyllum*, *Melia Azadirachta*, *Liquidambar orientalis*, *Cicuta virosa*, *Œnanthe crocata*, and *Piper Cubeba*, that of *Œnanthe crocata* occupying a double plate. *Aconitum ferox* has been figured only once before, in an Edinburgh journal, and its appearance is therefore most welcome. The remarks under this plant comprise an account of the most recent investigations concerning the aconite alkaloids, of which an admirable *précis* is given. A monograph of the aconites is much wanted, for the species get inextricably mixed in many botanical gardens, owing to the accidental alteration of the labels, and there exists at present no recent work in which all the species of this intricate genus are figured. Under *Melia Azadirachta*, the distinctions between it and *Melia Azedarach*, a tree often confounded with it, are carefully pointed out. The fruit of *Liquidambar orientalis* was drawn from a specimen in the Hanbury herbarium, which has on several former occasions furnished useful material for this great work. The authors have done well in placing *Cicuta virosa* and *Œnanthe crocata* in the same number. These two plants have frequently been confounded together in cases of poisoning, and the symptoms caused by the one have probably been often confounded with those of the other. In the interest of science the distinctions between the two plants cannot be too widely known. With regard to the *Piper Cubeba*, it is singular that no writer on the Piper genus seems to have noticed or described the colour of the mature fruit. The authors have, therefore, wisely left in uncoloured.

It has often been considered remarkable that of all the superior planets, Mars alone should have no satellite. M. Boutigny and others, reasoning from analogy, predicted in a speculative way that at some time in the future, it would be discovered that Mars in reality possesses its moon or moons also, and this prediction has received the attestation of truth quite recently. During last autumn Mars approached within 35,000,000 miles of the earth, and in August Professor Asaph Hall, of Washington, discovered two orbs attendant upon Mars. Since then many astronomers have confirmed this important observation. These moons are evidently smaller than the little asteroids or minor planets, and are indeed probably less than ten miles in diameter.

In the domain of vegetable physiology, Mr. Francis Darwin has made some most interesting observations. He has found that on the leaves of the common teasel there are attached to certain glandular hairs, translucent, highly refracting threads of varying length and form, and exhibiting remarkable spontaneous movements. These filaments consist of protoplasm containing much resinous matter, and they actually protrude from the interior of the glandular hair. They undergo violent contraction under the influence of many reagents, also by a temperature of 40—57°C., by electrical stimulation and by mechanical irritation In certain nutrient fluids, such as infusion of meat, their shape is modified and sometimes they becom detached. Their movements resemble the aggregation movements shown in the tentacles of *Drosera*. Mr. F. Darwin concludes that these filaments are concerned in the secretion of resin and absorption of nitrogenous matter. The power of secretion is attended by the death of the protoplasm, and in the teasel it appears that the protoplasm which by its death and change furnishes resin, has also life of such a nature that under certain conditions it can be utilised by the plant as a mode of nutrition.

The monthly *Microscopical Journal* for November and December contains a paper by Mr. Wentworth L. Scott on the microscopical examination of water. He says that often when the results of a chemical examination of a water make it passable, a microscopical examination furnishes evidence upon which the water should be condemned. This opinion, as will be seen directly, rests upon the possible detection of organisms in the water, as these are generally present in more or less quantity, and as when present in dangerous amount they are accompanied by other organic matters upon which only they can live, and which are detectable and estimable by chemical work, it is not necessary to endorse Mr. Scott's opinion. However, it is by no means an established proposition that such low forms of life are injurious to health; but it is unnecessary to discuss this question here. To assist in the microscopical examination of waters, Mr. Scott filters them through papers, the centre of which is rendered impervious by being coated with a mixture of 35 parts of vaseline and 65 parts of ozokerite. The living and dead suspended matter is thus concentrated within a small volume, and microscopical examination then reveals the number and varieties of organisms in a definite quantity of the water under examination. Mr. Scott says he has employed this method of procedure to learn the nature of the water often added to milk, and that in half-a-pint of one sample of milk he detected decomposing vegetable and animal matters, and also 87 living animalcules.

In the *Contemporary Review* for December, Professor Max von Pettenkofer writes on the hygienic value of plants in rooms and in the open air. In this paper he runs counter to some widely prevalent opinions. It is generally asserted that vegetation exercises three important functions of purification: firstly, by the absorption of carbonic anhydride; secondly, by giving out an equivalent of oxygen; and lastly, by the production of ozone. Now, Professor Pettenkofer admits all this, but at the same time he contends that these functions have not the importance in a hygienic sense which is generally assigned to them.

In Paris, where 2,944,000,000 litres of carbonic acid are (daily?) exhaled by men, animals and fuel, Boussingault found in the atmosphere only 4·13 parts per 10,000, while at St. Cloud it amounted to 4·14 parts. It has been similarly ascertained that in Manchester—a large manufacturing town where enormous quantities of coal are consumed—the proportion of carbonic anhydride in the air exceeds scarcely at all that observed at country stations. Without going into further detail, it may be at once explained that the reason why the atmosphere of large cities does not show the presence of more carbonic acid than the air of country places, is to be found in the currents arising from unequal rarefaction of the atmosphere. The same thing is true of oxygen as an atmospheric constituent; the air from the barren desert and the greenest oasis contain practically the same amount of carbonic acid and the same amount of oxygen. Professor Pettenkofer writes, "It would scarcely be intelligible if I were to calculate how much carbonic acid and oxygen a rose, a geranium, or a bignonia would absorb and give out in a room in a day, and to what extent the air might be changed by it, taking into account the inevitable change of air always going on." No doubt, but then it must never be forgotten that in spite of calculations it is through the growth of vegetation that the amount of carbonic anhydride in the atmosphere is kept balanced. It would be interesting, if we could afford the space, to calculate the volume of carbonic anhydride involved in the production of a eucalyptus tree 200 feet high and 60 feet in circumference at the base. These proportions may under favourable conditions be attained in about ten years, and if the product of our calculation were multiplied by the number of trees in a forest, the ultimate figure would be strikingly large. So, in a room also, plants do absorb carbonic acid and give out oxygen, but of course a man evolves much more carbonic acid than is absorbed by many plants.

Professor Pettenkofer has made no experiments upon ozone but he accepts the old statement of its production by vegetation, and is of opinion that it is a constant purifier of the atmosphere, although the amount of organic matter in the atmosphere is so great that the ozone never penetrates into our houses.

Having exploded all the comfortable opinions in which people have wrapped themselves for years, Pettenkofer seeks to bestow a few grains of comfort. He considers flowers in a room to have a hygienic influence by giving pleasure, just as a dog secretes gastric juice when shown a piece of meat. He also makes some observations upon the absorption of water from soils by vegetation and has a high opinion of the hygienic influences of trees, consisting in their effects of shelter from the sun, among which is the production of cooling breezes.

The paper we have alluded to contains, however, one error, and hence many erroneous deductions. So far as is known, plants do not produce ozone. Atmospheric ozone is probably the result of the action of electricity upon the air. The active agent produced by plants is peroxide of hydrogen, and it is surprising that Pettenkofer should not have been acquainted with this fact. His projected calculation therefore about the amount of oxygen a rose or geranium is capable of generating in a room assumes a new interest, if to the product we add the amount of peroxide of hydrogen also produced as well as the amount of organic matter it is capable of oxidizing, and since the production of that substance is intimately connected with the oxidation of essential oils it would be still more interesting to determine the average rate of volatilization of essential oils generally from plants and trees, and to calculate from this, by ascertained chemical equations, the extent of hygienic influence exerted. A wood containing 10,000 trees, evolving into the atmosphere essential oil at the rate of 10 grams daily from each tree, would furnish in the atmosphere about 25,000 grams of peroxide of hydrogen. Still more prodigious are the results produced by those camphoraceous substances which are found together with peroxide of hydrogen. The hygiene of plant life has many sides; Pettenkofer has studied only a part of these.

On the evening of the 16th inst. Dr. Lauder Brunton, F.R.S., gave an address at the Medical Society of London upon the assimilation of fat. He alluded to its general diffusion in the bodies of animals inhabiting cold regions, and pointed out that in animals living in warmer climates fat collected in localized spots, as for instance in the hump of the camel. He also stated that the softer fats—those containing a predominating quantity of olein—are the most readily absorbed. The digestibility of fats, however, is an individual quantity with different persons, and this has reference also to the nature of the fat. It is by no means certain that, as stated by Dr. Brunton, the digestibility of cod-liver oil is in part due to the presence in it of bile salts. It is true that cod liver oil gives with sulphuric acid and sugar the reaction which Pettenkofer discovered as characteristic of bile, but from recent researches it appears certain that many substances having no direct or known relation to biliary compounds also give this purple reaction.

Very little is known regarding the actual changes to which fats are subject in the body, nor is its economy or the pathology of fatty degeneration at all well understood.

In the stomach, fats are freed from any tissue with which they may be associated, and occur as oils in the intestines, where they are subjected to the combined influence of pancreatic juice and bile. Under the influence of the first of these natural juices, fat is partly decomposed into glycerine and free fatty acid, while another part is emulsified and made fit by subdivision to be more readily absorbed through the small pores of the cells which line the villi of the intestine. It is supposed that the emulsified fat which passes into the lymph ducts, and thus into the blood system, is burned up into carbonic anhydride and water, and in this way acts as a heat producer. Of the deposition of fat in certain parts of the body we are almost without any proper understanding.

In the last "Month" reference was made to the recent dispute about salt in beer. It appears that Mr. Plimsoll has since then avowed his knowledge of a case in which some 70 or 80 tons of salt were taken to a large brewery in a town in the midland counties. A correspondent, writing to the *Brewers' Guardian* of December 11, distinctly denies the accuracy of Mr. Plimsoll's information, and points out that the above quantity of salt if used would suffice to render nauseous no less than 13,667,500 gallons of beer, or 379,652 barrels of 36 gallons each, assuming the salt was added at the rate of 10 grains to half a pint of beer. It appears to us that if salt be added to beer at all it is a practice to which publicans are far more likely to resort than brewers, but no doubt we shall learn more about this subject before long; in the meantime it is perhaps best to suspend judgment.

As regards gin, the publicans are adopting the mode of labelling their bottles either as a mixture of dilute spirit, or as being so many degrees over proof. This is done, of course, to avoid prosecutions and fines, and we may hence expect that milk dealers will be found advertising and selling their commodity at the rate of so much per cent. solid constituents.

The milk "fake" case has attracted a good deal of attention. An *employé* of a milk dealer was charged with putting eight quarts of dirty water into some milk belonging to his employer. The prisoner, in cross-examination of his master, elicited the fact that when the milk run short the deficiency was usually made up by adding a watery solution of condensed milk to the supply.

The Royal Society has awarded the Copley medal to Professor J. D. Dana, of Newhaven, Connecticut, for his biblical, geological, and mineralogical investigations of the last half century. A Royal medal has also been awarded to Mr. F. A. Abel, F.R.S., C.B., for his physico-chemical researches on gun-cotton and explosives. Professor Oswald Heer, of Zurich, is the recipient of another Royal medal, presented in recognition of his numerous researches and writings on botanical subjects, and for his generalizations regarding tertiary plants and their geological and climatic relations. The first award of the Day medal has been made to Professor Bruish, of Heidelberg, and Professor Kirchhoff, of Berlin, for their researches in spectrum analysis.

In a series of papers recently published* by Friedel and Crafts there is described a new general method for the synthesis of hydrocarbons and acetones, through the active agency of aluminum chloride. For instance, when a solution of amylic chloride in benzene is treated with the metallic chloride, hydrochloric acid is set free and amyl-benzene is formed, thus—

$$C_5H_{11}Cl + C_6H_6 = HCl + C_6H_5(C_5H_{11})$$

Bromides and iodides are similarly acted upon, setting free hydrobromic and hydriodic acid respectively; thus ethylic iodide and benzene react upon each other in presence of the metallic chloride, giving hydriodic acid and ethyl-benzene—

$$C_2H_5I + C_6H_6 = HI + C_6H_5(C_2H_5),$$

Methylic chloride and benzene give rise to toluene. When the proportion of methylic chloride is increased, xylene, and mesitylene, also durene, are produced, a corresponding amount of hydrochloric acid being set free.

By the mutual action of benzylic chloride and benzene under similar conditions, diphenylmethane is produced. Bodies containing more than one atom of chlorine are similarly decomposable; thus chloroform gives triphenylmethane and carbon tetrachloride yields tetraphenylmethane.

Benzoic and acetic chlorides give benzophenon and acetaphenon.

Aluminum chloride is not the only metallic chloride which is capable of acting in this way; ferric chloride possesses a similar power, and ferrous chloride likewise, although in the latter case the application of heat is required.

* *Journ. prakt. Chem.*, 1877, xvi., 233.

Friedel and Crafts are of opinion that where aluminum chloride is employed, organic compounds containing the metal are first formed, and that these subsequently decompose giving once more the metallic chloride. The following equations represent this:—

Hypothetical compounds

$$C_2H_6 + Al_2Cl_6 = HCl + Al_2Cl_5(C_6H_5)$$
$$Al_2Cl_5(C_6H_5) + (CH_2C_6H_5)Cl = Al_2Cl_6 + CH_2(C_6H_5)C_6H_5.$$

Here the hypothetical metallic compound reacts on benzylic chloride, giving the metallic chloride and diphenylmethane.

Signor Orazio Silvestri,* in the course of an examination of a prehistoric doleritic lava occurring near the village of Paterno, found that it contains about 1 per cent. of oil. This solidifies at about 17° C., and is of a yellowish-green tint. Its chemical analysis revealed the following composition:—

	Per cent.
Liquid hydrocarbons (b. p. = 79°·28)	17·97
Hydrocarbons solidifying under 0° C. (b. p. = 280°—400°)	31·95
Paraffin, melting point 52°—57°	42·79
Asphalt (leaving 12 per cent. ashes)	2·90
Sulphur	4·32
	99·93

This oil is contained in irregular cavities coated with arragonite.

Fittica† has discovered a fourth isomeric nitrobenzoic acid, and it is pointed out that this discovery will not harmonize with the ordinarily accepted views regarding the structure of the benzene derivatives. He has also prepared a fourth nitro-benzaldehyde by acting upon benzaldehyde with sulphuric acid and ethylic nitrate. This product gives by oxidation the new nitrobenzoic acid $C_6H_4NO_2{\cdot}COOH$.

A. Michael has accomplished the production of halogen derivatives of amines. He replaces the basic hydrogen of the amines by acid residues and then exposes the products to the action of a halogen ethyl-phthalimide. $C_6H_4(CO)_2N.C_2H_5$ thus treated yields with bromine a tribromo-ethyl-phthalimide.

Genth has described‡ several new species of minerals, including coloradoite, which is found in the Keystone and Mountain Lion Mines of Colorado. It is not crystallized, but has an iron-black colour and metallic lustre, with a composition expressed by the formula HgTe.

Mercury	60·98
Tellurium	39·02

A second new mineral is magnolite (Hg_2TeO_4), and another is named ferrotellurite ($FeTeO_4$).

M. Cailletet§ has liquefied binoxide of nitrogen gas by exposing it to a pressure of 104 atmospheres at —11°, and in relation to this, M. Berthelot reminds chemists of the researches of Andrews, who has shown that every vapour exhibits a critical point of temperature, above which liquefaction cannot be obtained no matter what be the observed pressure. For binoxide of nitrogen the critical point lies between + 8° and — 11°.

The value of the ʒ symbol so warmly contested during the last two months in this Journal has finally and authoritatively been set at rest. That burning question, Civil Service Stores, never called forth so

* *Nature*, December 20, 1877.
† *Nature*, December 20, 1877. *Berl. Ber.*, x., 1644.
‡ *Amer. Journ. Science*, 1877, xiv., 423.
§ *Comptes Rendus*, No. 22, November 26, 1877.

much controversy. Woman's rights in pharmacy pale before it, and even counter-practice has to hide its diminished head in presence of this great question of the day, How many grains does the symbol ℥ represent?

The correspondence columns have been filled with the most able arguments, equally convincing to the advocates of one side, equally erroneous to those of the other, and it has required the able editor of the British Pharmacopœia, who, scarcely confident in standing alone on such a vital question, seeks the sanction and assistance of one of the committee, to explain what is the hidden meaning of a paragraph which has given rise to so much controversy. Be it observed then that for the future "by authority" A when written thus does not mean B.

And now to refer to the Dispensing Memoranda *seriatim*, as usual. No. 41 is a lotion of salicylic acid in water. The dispenser is not justified in straining out the undissolved acid. Salicylic acid is very sparingly soluble in water, and if the quantity ordered in the prescription be dissolved by heat it will for the most part crystallize out of the solution at a lower temperature. The acid should be rubbed up without the application of heat, and a label "shake the bottle" would indicate that the dispenser was aware of the undissolved acid. If a substance capable of crystallization be ordered in greater quantity than the fluid will hold in solution, it is better not to use heat, but merely powder, and diffuse it through the fluid; if heat be applied there will be such a crystallization within the bottle on cooling as to render it impracticable to divide the quantities correctly, but this can easily be done when the salicylic acid is merely rubbed to a fine powder and mixed with the fluid.

It is just possible that the writer of the prescription was aware of the difficulty, as he ordered the quantity required by the patient at each time "with an equal quantity of warm water." If, however, solution was his intention, warm water is not sufficient, for if a portion of such a mixture of salicylic acid be mixed with an equal quantity of water, it requires to be heated to 70° or 80° cent. to dissolve the acid, and when the temperature of the solution drops to 50° or 60° cent., the acid begins to crystallize out.

The introduction of salicylic acid is of recent date, and the comparative insolubility of the salt may not be known to every member of the medical profession. The prescription well illustrates the class of cases where a pharmacist may show his intelligence, and at the same time do an act of courtesy to the prescriber by bringing this fact under his notice and its bearing on what he has written.

No. 42 is a mixture of tinct. opii with pot. iodid. and liq. hyd. bichlor., and the question is, can this be prepared so as to form a bright solution? This combination cannot result in any other than an opaque mixture, followed by a flocculent deposit, and it should have a label indicating the necessity of shaking the mixture before taking each dose. A solution of iodide of potassium with hyd. bichlor. forms Mayer's test solution for the presence of alkaloids, which it throws down in an amorphous condition from very dilute solutions. In this mixture the alkaloids of opium would be thrown out of solution immediately the tinct. opium is added, as a brownish flocculent deposit, consisting of morphia together with other proximate principles of the opium. From this it will be seen that the precipitate cannot be left out without loss of one of the active constituents of the mixture. It is an instance of chemical incompatibility without its being necessarily medicinally so.

In No. 43 there is most probably an error in the quantity of rectified spirit. To the quantity of ointment stated one drachm of spirit is usual, and there is no difficulty in making a satisfactory ointment by rubbing them together in these proportions in a mortar; but one ounce of spirit is quite exceptional, and suggests some inquiry with reference to its correctness before being dispensed. If it really be required, probably the best mode would be to render the ointment creamy by a water-bath, gradually adding the spirit and stirring till cool; a separation, however, will eventually take place.

44. ℥j bis in 7 mane.—This may be written bis in septimanâ, and is translated twice a week. A direction somewhat similar is occasionally met with —"hora 7 ma matutina," which may be more fully written, "hora septima matutina," and rendered 7 o'clock in the morning. Directions in this form are by no means frequent, but their occasional presence may embarass one who has not had the advantage of great variety in dispensing prescriptions.

45. The extract of belladonna should be rubbed down with sufficient water so that it may be diffused in the ol. hyoscyami. Mucilage would not in this instance be admissible. An emulsion must not be expected. All that can be attained is a minute division of the liquefied extract through the oil, and the mixture should be shaken each time before use.

No. 46. Ung. Galeni.—There is no British pharmacopœia authority for this ointment, although the French Codex contains a Cérat de Galien, made by melting 1 part by weight of white wax in a water-bath, together with 4 parts of oil of sweet almonds and 1½ parts of rose water, pouring the mixture into a warmed mortar and incorporating with it, in small portions at a time, 1½ parts more of rose water whilst cooling. Such a preparation probably derives its name from Galen, who wrote two treatises on the composition of medicines, containing a considerable number of formulæ. It is now understood to mean an ointment free from any chemical ingredient, and would be fairly represented by simple ointment or cold cream.

48. Hyd. disulph. evidently means hydrarg. disulphid. or vermilion. It cannot be either hyd. sulphat., or turpeth mineral, which is an oxysulphate of mercury.

49. If the liquor ammon. acet. be neutral or even acid the mixture can be made clear without difficulty, but should it have much free alkali hydrate of iron will be thrown down as a flocculent precipitate. In the presence of a difficulty of this description, it should be ascertained that the several preparations of which the mixture is composed correspond to the Pharmacopœia standard. If this procedure were more generally adopted there would be less diversity in the same prescription made up at different establishments.

It would certainly add to the interest and probably the value of the Dispensing Memoranda if correspondents would just state what they had themselves done to secure a good result before sending their difficulties to this Journal. In addition, then, to suggesting a better method of procedure a few remarks could be added on the cause of failure. Where no effort has been made little good will result from the memoranda; the same mixture can be dispensed again, and the same ointment repeated, but unless the principle be understood a slight departure from the letter of the last difficulty will find the inquirer once more on the horns of a dilemma.

In last month's Journal a reply was given to an inquiry after a formula for tr. chinæ nit. suggesting the probability of its being a tinct. of *Cinchona nitida*, at the same time recommending a reference to the writer of the prescription. From answers very kindly sent by two correspondents it appears that this preparation is one belonging to homœopathy, and is made by dissolving quinæ disulph. in water acidulated with nitric acid to which sp. vini rect. is added. The Homœopathic, together with with almost every other European Pharmacopœia, was referred to, but there was no indication of any tr. chinæ nit., and it is even now difficult to understand why the name china should be given to a solution of quinine. In the Homœopathic Pharmacopœia china is rendered *Cinchona officinalis*, Engl. Peruvian bark. Quinine is chininum, and sulphate of quinine, chininum sulphuricum. In no language, and in no pharmacopœia, is quinine represented by the word china.

In Hager's 'Medicamenta Homœopathica,' under "Modus Parandi Tincturas," is the following:—"Tincturæ sunt extractiones spirituosæ e substantiis plerumque siccis præcipue ex herbis, foliis, radicibus, corticibus seminibus siccatis." In presence of this view of the preparation of a tincture how can a solution of quinine in nitric acid be properly called in homœopathic phraseology a tincture?

It is no easy matter for a dispenser to grapple satisfactorily with the many varieties of prescriptions coming daily under his notice—some of these containing recently introduced medicinal agents, the composition of which may not be thoroughly known, and their behaviour with other remedies quite untried; but when to this is added ordinary solutions of well-known remedies under "misnomers," constituting an addition to the class of "obscure prescriptions," he may well be pardoned for uttering an indignant protest against conduct embarrassing the many whilst favouring the few.

Amongst novelties connected with pharmacy may be mentioned a very elegant form of capsule for nitrite of amyl, introduced by Mr. Martindale. It is in the form of a tube drawn out to a point at both ends and enveloped in a small wrapper of silk to prevent accidental breakage.

Mr. W. Hay, of Hull, has, after much labour, succeeded in preparing an essence of ginger containing most, if not the whole, of the essential oil or aromatic constituent of the root,* but quite free from the acrid resin which forms so large a portion of the ordinary essence or tincture of ginger. Mr. Hay's essence has the aroma of ginger without the unpleasant taste of the resin, and it is perfectly miscible with water without causing any of the turbidity which results on mixing the tincture with water in consequence of the precipitation of the resin. On this account Mr. Hay's essence is specially adapted for flavouring ginger beer, and it will remove the excuse for using cayenne in that beverage as a substitute for ginger when it is desired to avoid the turbidity caused by the tincture containing resin.

Messrs. James Allen and Son have lately constructed a very convenient form of invalids food warmer, consisting of a tin stand into which fit a small saucepan, a kettle, or a covered earthen pan, the contents of each of which can be heated as required by means of a spirit lamp or a night light, according to the purpose intended. In this way beef-tea, cocoa, or other preparations to be taken at intervals by invalids can be kept moderately warm during the night, and heated up within a few minutes. The compact form of the apparatus will render it a useful adjunct to the appliances of the invalid's bed-side.

* See *Pharm. Journ.*, No. 370, p. 71.

In this "Month" of December it is natural to look back to the time—now twelve months since—when this series of articles was initiated. During the interval there has been an opportunity of referring cursorily to many matters of more or less general interest to the readers of this Journal, which otherwise would not have received notice in these columns. Believing still in the want of such an article as the "Month," which serves not only a journalistic but a public purpose, and in view of its attained success, it is proposed to perpetuate it in the future It will still be attempted to notice all subjects of current interest and importance, and to lend weight to all true advance in pharmacy and the sciences upon which it depends.

COLCHICUM SEED.*

BY NATHAN ROSENWASSER, PH.G.

The author prepared the active principle of the seed, and found it to have a neutral reaction to test paper, and to be not precipitated from aqueous solutions or solutions acidulated with organic acids, by potassio-mercuric iodide, sodium phospho-tungstate, auric chloride, phosphomolybdic acid and solution of iodine, all of which reagents afforded precipitates after the solution had been acidulated with a mineral or oxalic acid, or had been boiled for a few minutes with acetic acid; he argues from this that the principle is naturally neutral, and is converted into an alkaloid by the influences mentioned.† The neutral substance, colchicin, was with some difficulty obtained in crystals by the slow evaporation, in deep vessels, of its solutions in fusel oil and benzol, and found to be insoluble in pure ether, carbon bisulphide and petroleum benzin.

It having been asserted that the active principle resided chiefly in the outer integuments of the seed, and that for this reason they could be almost completely exhausted without being ground, the author experimented with 5000 grains of unbroken seeds, macerated them in diluted alcohol in a warm place for ten days, and washed them well with diluted alcohol; the tincture and washings were used for preparing colchicin by Carter's process (*American Journal of Pharmacy*, 1858, p. 205), of which five grains was obtained. The same seeds afterwards crushed to a uniform powder yielded eleven grains colchicin. 5000 grains of seeds of the same lot were ground, and yielded sixteen grains; and 14,000 grains of the same seeds, rolled and crushed, yielded forty-five grains of colchicin. It follows, therefore, that only less than one-third of the colchicin present can be exhausted from the unbroken seeds. In preparing colchicin, particularly in warm weather, it is found unnecessary to remove the fixed oil by filtration previous to precipitating the colchicin by tannin; it is better to collect the precipitate, dry it carefully by means of a water-bath, and then exhaust the oil by gasolin. For the decomposition of the tannate aluminum hydrate seems to possess decided advantages over ferric or plumbic hydrate, it serving at the same time as a decolorizing agent.

When distilling the alcohol from the tincture the odour of the ground seed was distinctly recognized in the distillate, which turned milky upon the addition of water.

* From the *American Journal of Pharmacy*, Sept., 1877.

† *Colchicien* is formed under these circumstances, which ombines with bases, but not with acids.—EDITOR A. M. P.

On distilling a pound of the ground seeds with water, an aromatic distillate was obtained, but a volatile oil, which probably exists in minute quantity, could not be separated. The distillate was tested for alkaloids with a negative result.

Flückiger and Hanbury give 6·6 per cent. as the amount of fixed oil present in the seeds; the author obtained 14 drachms (8·4 per cent.) from 10,000 grains of the seeds. After purifying it by treatment with benzin and animal charcoal, it had a light-brown colour and a bland taste. It was found to be readily saponifiable.

SOME CONSTITUENTS OF HOPS.*

BY EMERY GILBERT BISSELL, PH.G.

It is pretty generally supposed that lupulin contains all the active principles of the hop. Some doubt in regard to this having been recently expressed, the writer has endeavoured to settle the question, with what success may be judged from the following experiments. The best of hops were selected, those as nearly ripe as could be found during picking; from these the bracts were carefully removed; the ends next to the achenes, to which part of the bracts most of the lupulin adheres, were trimmed off with scissors; the remainder of each bract was then passed between the thumb and finger to remove the remaining particles of lupulin, a magnifying glass being used from time to time to see that the work was thoroughly accomplished. This process is a difficult and tedious one, the lupulin adhering to the bracts with considerable tenacity. The bracts were then allowed to dry, without the aid of artificial heat, and were found to shrink about three-fourths in weight; after much perseverance one troy ounce of the dried bracts was obtained. Some difficulty was next experienced in powdering them; rubbing them with sand in a mortar was first tried, and found to be exceedingly slow work; grinding in a drug mill was next attempted, but found to be simply impossible; the method finally resorted to, and found to work nicely, was to cut the bracts in pieces with shears. This may readily be done by grasping the hand full of them and passing the shears repeatedly through many of them at once, sifting out the fine particles from time to time. The powder thus obtained was exhausted with stronger alcohol, and a tincture obtained possessing a bitter taste and some odour, neither of which would, however, hardly remind one of hops. The alcohol was distilled off from the tincture, and an extract obtained weighing seventy grains. To the distillate was added some water, the alcohol distilled off at a gentle heat, and the heat then raised. The distilled water was observed to have a slight foreign odour, but could not be recognized as the odour of hops; it had no effect on litmus paper, and produced no change in colour with a solution of permanganate of potassa, evidently containing not more than the merest trace of volatile organic matter.

Of the extract obtained twenty grains was reserved for further experiment, the remaining fifty grains being tried in the following manner:—One half of it was given to a healthy person; no effect being experienced, in one hour the remainder was given; no effect whatever was noticed upon either pulse, temperature or respiration. The portion reserved was dried by means of the water-bath until it ceased to lose weight, after which the weight was found to be 1·013 gram; of this, ·225 gram, or about 22 per cent., was insoluble in water; the portion soluble in water was found to give the reactions characteristic of tannin, and also to contain a small amount of bitter extractive. The amount of the extract reserved was, however, too small to admit of many experiments.

I then endeavoured to determine the nature of the tannin contained in hops, 700 grains of which were exhausted with boiling water, the decoction evaporated nearly to extractive consistence, and treated with alcohol to remove the gummy matter. The alcohol was evaporated and the residue dissolved in water; the percentage of tannin was then estimated by means of a standardized solution of gelatin containing alum; only about 6 per cent. of tannin could be found. The remainder of the solution was then precipitated with neutral acetate and with subacetate of lead; the two precipitates had much the same appearance, and both were soluble in acetic acid. They were each thoroughly washed, then suspended in water, and decomposed with sulphuretted hydrogen. The filtrate from each was found to contain the tannin, which gave a blackish-green colour with ferric chloride, and precipitated a solution of gelatin containing alum. The two solutions were mixed and the tannin precipitated with an excess of common salt, from which an unsuccessful attempt was made to entirely free it.

For the final experiment six ounces of hops were taken and exhausted with boiling water; the decoction was concentrated, treated with alcohol, filtered, the alcohol evaporated off, the residue dissolved in water, and the percentage of tannin estimated as before; only a little more than five-tenths per cent. being found. The solution, being acid to test paper, was carefully neutralized with ammonia and precipitated with neutral acetate of lead, a bright yellow precipitate being obtained; the filtrate gave no reaction with subacetate of lead and contained no tannin. The precipitate was thoroughly washed, suspended in water, decomposed with sulphuretted hydrogen, the precipitate washed until the washings gave no colour with ferric chloride, and the filtrate evaporated to a small bulk, and shaken with ether in hopes that the tannin might be dissolved; the ether, however, failed to take up any of the tannin, and portions of the solution were therefore treated with the following reagents:—tartar emetic, which produced a nearly white precipitate on standing; ferrous sulphate, no effect; sulphuric and hydrochloric acid at once produced precipitates; protochloride of tin, no effect; sulphate of copper, no effect; solution of potassa gave a dark reddish-brown colour, but no precipitate; gelatin gave a precipitate on standing. The green-black precipitate with ferric chloride certainly indicates that this is not gallotannic acid, which in other respects it resembles, and the reaction with the mineral acids would seem to show with equal certainty that the tannin is not moritannic acid, which it is stated by Wagner to resemble.

* From the *American Journal of Pharmacy*, Dec., 1877.

THE ADULTERATION OF EXPRESSED OIL OF ALMONDS.*

Mr. J. D. Bieber, of Hamburg, has ascertained that the larger portion of the commercial expressed oil of almonds (oil of sweet almonds) is either adulterated or entirely fictitious. In the most favourable cases peach-kernel oil is substituted in its place. The admissibility of the oil obtained from peach- and apricot-kernels might possibly be defended on the ground that the latter are nearly alike in chemical composition (?) and in price to the small Barbary almonds. The author has succeeded in finding a reliable reagent to distinguish the pure almond oil from sophistications. His results are based on experiments made with the oil of sweet as well as bitter almonds of all commercial varieties, and on those made with other oils. It was first ascertained that the age of the almond oil, or its manner of preparation (by cold or hot pressing), had no influence upon its chemical behaviour towards the reagent. This latter is prepared by mixing equal weights of pure concentrated sulphuric acid, red fuming nitric acid, and water, and allowing the mixture to cool. Mixtures made with five parts of oil and one part of the acid show the following characteristics:—

Pure almond oil: a faintly yellowish-white liniment.

Peach-kernel oil: assumes at once the colour of peach-blossoms, turning afterwards dark orange.

Sesame oil: first pale yellowish-red; afterwards dirty orange-red.

* From the *Pharmaceutische Zeitung*, quoted in *New Remedies*, November, 1877.

Poppy oil and walnut oil: a somewhat whiter liniment than pure almond oil.

Mixed with pure nitric acid of 1·40 specific gravity the behaviour is as follows:—

Almond oil: pale yellowish liniment.

Peach-kernel oil: at once a red liniment.

Sesame oil: dirty greenish-yellow; afterwards reddish.

Poppy oil and walnut oil: an entirely white liniment. With the first-mentioned reagent (mixture of acids and water), an addition of five per cent. of peach or sesame oil may be readily recognized. By making a series of mixtures of almond and peach oil, differing by ten per cent. among themselves, it is easy to discover, with tolerable accuracy, the proportion of the two oils in an adulterated sample. In order to distinguish whether the foreign oil was sesame or peach oil, the reaction with nitric acid of 1·40 specific gravity is had recourse to. Besides the above-mentioned substitutes, there exist some other oils, chiefly prepared in France and Italy, which greatly resemble almond oil, and might be used as adulterants. One of these is the fatty oil expressed from the seeds of the stone pine (zirbel nuts, pine nuts), which has, however, not been examined by the author.

To the above the editor of *New Remedies* adds:—A very common sophistication, namely, oil of mustard, has not been mentioned by the author; but it is well known that it is often sold for sweet almond oil.

THUJA OCCIDENTALIS.

The following memoranda relative to the use of preparation of *Thuja occidentalis*, which appears just now to be attracting some interest in New York, have been contributed to *New Remedies*, by Dr. J. R. Leaming.

"The fluid extract or saturated tincture may be given in drachm doses from three to six times daily.

"It may be given for malignant disease or for pulmonary hemorrhage in a glass of milk or in cod-liver oil.

"It may also be applied to cancerous ulcerations or tumours. It may be applied in the cavity—in the os—or to the cervix of the uterus in malignant disease, or in non-malignant, when there is a flabby condition of the parts with a tendency to bleed; and also, under the same conditions, to the throat. It may be applied to warts, and especially to venereal warts.

"It may be given in amenorrhœa from simple causes, but does not affect a healthy gravid uterus.

"The elixir of thuja and glycerine is a more elegant mode of administering the medicine, and is a valuable substitute for cod-liver oil.

"The glycerole may be made into suppositories, or it may be mixed with the fluid extract, for application to the os uteri upon a pessary of cotton.

"This medicine may become very useful to the practitioner in the treatment of malignant disease, especially in diminishing tendencies to bleeding and rapid progress of the local disease. It also relieves the violence of pain. In some cases the disease has disappeared under its use—not always."

The literature referring to this drug is quite limited. A. Kawalier, of Vienna, discovered a bitter principle, which he called *pinipicrin* (found also in *Pinus sylvestris*), a volatile oil, sugar, gelatinous matter, a variety of wax, resin, and tannic acid (*Chem. Gaz.*, Feb. 1, 1855, p. 45); and more recently a peculiar crystallizable colouring principle, which he termed *thujin*, another yellow substance, which he called *thujetin*, and still a third *thujigenin*; also a variety of acid, which he named *pinitannic*. Kawalier's second paper in the *Chem. Gaz.*, Nos. 392–3, pp. 61 and 68, 1859, is said to contain a full description of the processes he employed.

Regarding the properties of thuja, the wood when burnt gives off an agreeable smell, which led to its former use for sacrificial purposes. A salve made with the leaves used to be a remedy employed by the Indians for the relief of rheumatism, and a poultice of the leaves made with milk has been highly spoken of for the same purpose. By distillation the leaves yield a yellowish-green volatile oil, which has been used as a vermicide. Boerhaave praised the action of the distilled water as a remedy for dropsy.

Some years ago Dr. Leaming contributed to the *N. Y. Journal of Medicine* (N. S., xiv., 406), a paper on the use of thuja in affections believed to be cancerous, and in venereal excrescences, and in 1856, in the same journal, Dr. Benedict recommended the strong tincture as an emmenagogue.

Thus far thuja appears to have been employed empirically only, but it would seem, on reviewing the affections in which it had been of service, that its action may be explained by a property somewhat similar to that possessed by ergot, namely, of causing contraction of unstriped muscular fibres. This would explain, in some degree, its alleged power of controlling capillary hemorrhage, and the growth of vascular tissues like cancer and condylomata.

NUMBER OF KNOWN PLANTS.*

At a Botanical Congress held at Brussels in May, last year, Professor E. Morren, of Liege, in opening the discussion as to the best means of forming a 'Hortus Europæus,' or General Methodical Catalogue of all Cultivated Plants, gave some interesting statistics which are well worth reproducing from 'La Belgique Horticole':—

"It is to be regretted that Adam and his family did not in the leisure time of their youth think of writing an inventory of the garden which was the cradle of humanity. Our first father gave, it appears, each animal its true name, while he busied himself in a very different way with the trees, and this is precisely the reason why botanists are still burdened with naming and classifying, by the sweat of their brow, all the plants on the earth. Mention is made in the Bible of about 500 plants, clearly determined, while some 50 others are designated in more general terms. In the works of Hippocrates we find 234 plants mentioned, and in those of Theophrastes about 500. Dioscorides knew nearly 600, and we find 800 names of plants in Pliny's 'Natural History;' but, like all the sciences of observation and the technical arts, it is only since the renaissance that botany has made much progress. In the sixteenth century we find 800 plants in the works of Conrad Gesner, 1400 in those of Charles de L'Escluse, 2731 in the 'Historia Generalis Plantarum' of J. Dalechamps in 1587, 6000 in the 'Pinax Theatri Botanici' of Gaspard Bauhin. The seventeenth century is marked by the works of Tournefort (1694). He knew 10,146 kinds, and was the first to divide them into genera, to the number of 694. The 'Historia Plantarum' of Jean Ray treats of 18,655 species of plants, among which, however, a rather large number are mentioned twice. In the eighteenth century the immortal Charles Linnæus appeared, the founder of the scientific nomenclature, and the most judicious of botanists. The first edition of his 'Systema Plantarum,' in 1753, comprises 6200 species clearly distinguished. At the latter part of his life he had defined 5790 dicotyledons, 881 monocotyledons, and 623 cryptogams, in all 7294 plants, distributed over 1239 genera. We now arrive at the nineteenth century. According to the 'Synopsis Plantarum' of Persoon (1805—7), 25,000 to 26,000 species were known, divided into 5000 or 6000 cryptogams, 4000 to 5000 monocotyledons, 15,000 dicotyledons. The work comprised only 2303 genera of phanerogams. As to the plants raised in gardens, to give an approximate idea of those which then existed, we find in the most important works of that period 6351 names of plants in the 'Enumeratio Plantarum H. R. Bot. Berolinensis' of Willdenow, 1809; 9123 species, exclusive of varieties, in the second edition of the 'Hortus Kewensis' of W. T. Aiton, 1810—1813; 10,299 species in the 'Enumeratio Plantarum H. R. B. Berolinensis' of H. F. Link, 1821. About the same time (1819) P. De Candolle, in the second edition of his 'Théorie Elementaire de Botanique,' estimates the

* From the *Journal of Applied Science*, October 1, 1877.

number of species then scientifically known at 30,000. If the numbers of Persoon and of De Candolle are compared with those of Willdenow, Aiton, and Link, it will be seen that the number of plants cultivated was about one-third of those known. In 1824 Steudel published the first edition of his 'Nomenclator Botanicus,' a vast compilation, in which he enumerates in alphabetical order, and without criticism, all the names of plants which he had been able to find in the books published after those of Linnæus. He gives 59,684 names of phanerogams, 10,965 cryptogams, in all 70,649 plants, ranged in 3,933 genera. The second and last edition of this catalogue, always useful, in spite of its age, contains 78,000 names of phanerogams, and 6,722 genera. It must, however, be remarked that these figures apply to names existing in science rather than to things existing in nature. At this period some works appeared in England which are particularly worthy of our attention. We mean the 'Hortus Britannicus' of Robert Sweet and John Claude Loudon. That of Sweet appeared in 1827, and was successively improved in its editions of 1830 and 1839. The second (of Loudon), appeared in 1830, 1832, and 1839. If it has not the merit of priority, it offers, at least, the advantage of being classified in the natural orders. These two works treat of all the plants already cultivated in England. Loudon enumerates in 1839, 31,731 species and 3732 genera. In 1845 we find Laseque estimating all known plants at 15,000 cyptogams and 80,000 phanerogams. John Lindley, in 1846, divides these latter into 66,435 dicotyledons, and 13,952 monocotyledons. Etienne Endlicher (1836–40) describes, in his memorable 'Genera Plantarum, 6,895 genera known in the vegetable kingdom, including the fossil plants, or only 6136 genera actually living, and 240 families. The gardens contained, therefore, at this period, about a third of the phanerogams described, and more than half of the existing genera. In 1853 J. Lindley ('Vegetable Kingdom') estimated the number of genera and species in the entire vegetable kingdom as follows:—

	Genera.	Species.
Thallogens	936	8394
Acrogens	310	4086
Monocotyledons . . .	1457	14,005
Dicotyledons	6248	66,435
Or:—Cryptogams	1246	12,480
Phanerogams	7685	80,446
Total	8931	92,920

The augmentation of the contingent is rapid and incessant. In the first half of the century, the number of species cultivated rose in round numbers from 10,000 to 30,003, and that of the plants in herbariums from 30,000 to 90,000; that is to say, they were tripled. Lastly, in 1863, Bentley gives the number of known species at 100,000 phanerogams and 25,000 cryptogams. It is most probable that these figures will be doubled when the whole surface of the earth has been explored. In the meantime, the total of all known plants may be estimated at 90,000 dicotyledons, 20,000 monocotyledons, and 40,000 cryptogams—about 150,000 species, divided in 8000 genera. The 'Synonymia Botanica' of Dr. L. Pfeiffer (1870) gives, it is true, 12,908 names of genera, but these figures include all the fossils, and a great number of doubtful genera. It may therefore be assumed that the number of plants actually cultivated amounts to something like 40,000 botanical species, without counting the races and varieties. At this rate there would be about ten thousand species to add to the 'Hortus' of 1839—say, in round numbers, 250 to 300 species a year. The inventory made by M. André De Vos gives 175 new names of ornamental plants, first described and figured in 1876. The flora of the greenhouses and gardens then comprised about 40,000 cultivated species, and the rural flora of Belgium counts at the most 12,000.

SOUTH LONDON SCHOOL OF PHARMACY.

The fifth annual dinner to the students of this institution was held on Friday, December 21, at the Horns Assembly Rooms, Kennington Park, Dr. Muter occupying the chair.

The toast of "The Queen" having been given,

The Chairman proposed the toast of the evening, "Success to the South London School of Pharmacy." He said the duty he had to perform was a light and easy one, because every one would gladly re-echo the universal cry, "Success to the Old School," a school which had led many to honours that could never be taken from them, and others to the knowledge necessary for gathering together the requisite "little pill" which every one sought to attain in an honourable manner. He had not now met them to explain the mysteries of the terrible theories of chemistry, but merely to again hold out the right hand of friendship. On occasions like the present it was usual for him to say something about the spread of pharmaceutical education, which the South London School of Pharmacy had partly been the means of bringing to its present state of efficiency. He really had little to say upon this matter, except to express his conviction that nothing could possibly be better than the working of things at the parent house in Bloomsbury Square. The examinations were conducted by most competent examiners, and he might say that no body of men were so thoroughly sifted before being let loose upon the public as pharmaceutical chemists. It should be a matter of great thankfulness to the public to know that their lives were in the hands of a body of men whom they might thoroughly trust. The great event of the year had been the unwise proceeding on the part of certain medical men in trying to take out the mote from the eye of the prescribing druggist before they removed the beam from the same organ of the dispensing doctors. He did not propose to enter further into the subject because there were present many of the leading physicians of London. No doubt they would hear from the gentleman who was going to distribute the prizes that the true heads of the medical profession did not approve of the petty persecutions which had lately been indulged in.

Dr. Julius Pollock, in a few appropriate words, then presented the prizes to the successful students.

The Chairman having proposed the health of Dr. Pollock, in response,

Dr. Julius Pollock said reference had been made by Dr. Muter to certain relations between the medical professions and pharmacy, and he trusted he thoroughly appreciated what those relations should be. They all had certain functions to perform, but the functions of the physician and the chemist were of a different character. They need not come into collision with one another any more than did the functions of the House of Commons and the House of Lords. No one knew more than the practical physician how much he owed to the practical chemist. Physicians saw their patients, went into their symptoms, and adopted a certain line of treatment assisted mainly by the administration of certain drugs, but if those drugs were not carefully dispensed he should like to know what success the physician would be likely to attain. The physician was entirely in the hands of the chemist, for his success was dependent upon the care, discrimination, caution, and knowledge possessed by those who subsequently had to administer to the patient in the shape of prescriptions.

Mr. Baxter (Vice-Chairman), in proposing the health of the "Successful Students," said he hoped the time would come when the examinations would be written, believing that by this means the true genius of a man would be seen. He was glad to say that the student who gained the highest number of marks at Bloomsbury Square had been educated at the South London School of Pharmacy.

Messrs. David Jones and Mortlock responded to the toast.

Various other toasts were given during the evening and the proceedings were considerably enlivened by the singing of duets and songs by the students.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 29, 1877.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE PARIS SOCIETY OF PHARMACY.

ABOUT twelve months since it was mentioned in this Journal that the wish of the widow of the late Professor GOBLEY to present a sum of money to the Société de Pharmacie had suggested the proposition of securing the recognition of that Society as an "*établissement d'utilité publique*," so that it might be enabled legally to receive gifts of money from its members or others. This proposition was unanimously agreed to, and at a meeting held on the 4th of April, 1877, a Committee was appointed to report on the subject. This it did in the following month, and then took the requisite steps to communicate with the Government officials for the purpose of obtaining the desired object. A decree has now been issued by the President of the Republic granting the privilege sought, and confirming the modified statutes which had been drawn up to suit the altered circumstances of the Society. From among these statutes the following is selected as indicating in a general way the nature of the Society.

The object of the Society is defined to be the establishment of intimate relations among the pharmacists of France and of foreign countries as well as to improve the art of pharmacy and to advance the sciences which relate to it. The number of Members is limited to sixty, resident in Paris, besides which there are twenty Associates and one hundred and twenty Provincial Correspondents; the number of Foreign Correspondents as well as that of Honorary Members is not limited.

One of the necessary steps to obtain the recognition of the Government was the presentation of an historical account of the Society, setting forth its origin, organization, object, and the services it had rendered. From this it appears that the Society took its origin as a consequence of the suppression of the old College of Pharmacy, together with other trade guilds and fraternities, in 1791. The business of the pharmacist being thus thrown open to all without the necessity of special education, accidents became frequent, and gave rise to so many complaints that the Committee of Public Health, then presided over by the celebrated Dr. GUILLOTIN, applied for and obtained a decree reviving the law and regulations relating to pharmaceutical education as well as to the preparation and dispensing of medicines. To quote the report, "The two years of anarchy which preceded this step served at least to teach a lesson that should not be forgotten, for they furnished in a high degree evidence of the necessity of regulating the practice of pharmacy by special laws. It was in vain that the freedom of trade was invoked, since it was out of place, and the interests of the public health ruled the whole discussion of the subject."

Subsequent to this decree the pharmacists of Paris, including, amongst other names eminent in science, VAUQUELIN, PELLETIER, BOUILLON LE GRANGE, LE CANU, and PARMENTIER, formed themselves into a voluntary society, having the object of promoting the progress of science, and especially of pharmacy, chemistry, botany, and natural history. In 1797 the Directory recognized this Society under the title of the Free School of Pharmacy. Subsequently the title was changed to that of the Society of Pharmacy of Paris, its constitution and statutes being almost the same as those of the present day.

In 1809 an important step was taken in the establishment of an official organ of the Society under the title of the *Bulletin de Pharmacie*, which in 1815 became the *Journal de Pharmacie et des Sciences Accessoires*, and this in its turn was succeeded in 1842 by the *Journal de Pharmacie et de Chimie*.

As regards the connection that exists between the teaching organization and the scientific society it is mentioned that the former rarely exists without being accompanied by the latter. In this manner, in France, the Academy of Medicine is the necessary corollary of the faculty of medicine, whilst the Society of Pharmacy bears the same relation to the Superior School of Pharmacy, and the provincial societies are in like manner associated with the local schools.

Since 1830 the Society has had the good fortune to have the position of General Secretary filled by ROBIQUET, SOUBEIRAN and BUIGNET, whose contributions to science have entitled them to hold a high place amongst its cultivators. Other members of the Society have also contributed largely to the advancement of chemistry and its application, amongst whom may be named SERULLAS, BOULLAY, PÉLOUZE, ROBINET, SERTURNER, PELLETIER, CAVENTOU, and BERTHELOT, who also belonged to the ranks of pharmacy, and only a few weeks since exchanged his position of Resident Member for that of Associate.

Among other services rendered by the Society of Pharmacy was the part taken at the Medical Congress in 1845, which, upon that occasion, placed the section of pharmacy upon a level with the section of medicine. The excitement caused among French pharmacists in the following year by the promulgation of the *ordonnance* relating to the sale of poisons induced the Society of Pharmacy to appoint a Commission for the purpose of demanding its revision, and it was successful in effecting this object.

In 1863, when a new edition of the Codex was in preparation, six members of the Society were appointed members of the Commission charged with this duty. At the same time the Society divided its sixty resident members into twenty sub-committees for the purpose of revising the mode of preparation and conservation of one or other class of medicaments, thus lending by virtue of their special competence an effectual support to the Commission, to the Academy of Medicine, and to the School of Pharmacy.

More recently, in response to applications from the provinces, a commission of five members was appointed to define the composition and preparation of new remedies, in regard to which there was want of uniformity and consequent inconvenience to medical men, pharmacists and patients. The report of this Commission has recently appeared in this Journal.

In addition to these claims to be regarded as a "society of public utility" numerous prizes have been conferred for essays on subjects connected with abstract and applied science, among which may be mentioned those of Bussy on animal charcoal, Fremy on the pectous and gelatinous substances of fruit, and Pasteur on tartaric and racemic acids.

COVENTRY AND WARWICKSHIRE PHARMACEUTICAL ASSOCIATION.

The opening meeting of the above Society is announced for the 10th January, 1878. The President (Mr. Councillor Wyley), will deliver the introductory address, and there will be an exhibition of new remedies, chemicals, microscopes, and objects of general scientific interest. The telephone will also be shown, and there will be demonstrations of cigar manufacture, and of the manufacture of the iodides of potassium, mercury, and lead. The Honorary Secretary, Mr. F. J. Barrett, will be glad to receive any donations of books, specimens, and articles for exhibition. We are glad to find also that "Preliminary" and "Minor" classes are to be formed in connection with this new Association, and students wishing to join them are requested to at once send in their names to the Honorary Secretary, 75, Hereford Street, Coventry.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association will be held at 17, Bloomsbury Square, on Friday evening, January 4, when a paper by Mr. Shapley will be read by the Secretary, on "Blood, Chemical and Microscopical." The chair will be taken at 8 o'clock.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN EDINBURGH.

December 19, 1877.

Present—Messrs. Ainslie, Borland, Gilmour, Kemp, Kinninmont, Stephenson and Young.

Professor Maclagan was also present on behalf of the Privy Council.

MINOR EXAMINATION.

Twelve candidates were examined. *Three* failed. The following *nine* passed, and were declared qualified to be registered as Chemists and Druggists:—

Adamson, William Francis......Blackburn.
Brasnett, Robert John............King's Lynn.
Cairnie, David Dandie............Perth.
Cluckie, Andrew ....Greenock.
Cockburn, James ....Glasgow.
Donaldson, James..................Edinburgh.
Glass, William Stephen ....Friockheim.
Hatton, Frederick William......London.
Horsfield, Edmund ... .Holbeck.

December 20, 1877.

Present—Messrs. Ainslie, Borland, Gilmour, Kemp, Kinninmont, Stephenson, and Young.

MINOR EXAMINATION.

Nine candidates were examined. *Two* failed. The following *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Johnson, Samuel ....Barnard Castle.
Jones, Charles Alfred ....Birkenhead.
Keith, Sydney ....Perth.
Lee, Alexander Milne ....Strichen.
Richmond, William Wilkinson...Carlisle.
Schofield, Frederick Elston......Morpeth.
Wilson, James . ...Buckie.

MODIFIED EXAMINATION.

One candidate was examined, and was declared qualified to be registered as a Chemist and Druggist:—

Farquhar, Robert ....Kilmarnock.

Proceedings of Scientific Societies.

ROYAL SOCIETY.

Researches on the Effect of Light upon Bacteria and other Organisms.

BY ARTHUR DOWNES, M.D., AND THOMAS P. BLUNT, M.A. (OXON.), F.C.S.

At the meeting of the Royal Society on the 6th inst., an interesting paper on the above subject was read on behalf of the authors. The investigation to which it related was undertaken with the view of ascertaining whether light could be shown to exert any appreciable influence, favourable or the reverse, upon the development of bacteria and other organisms in solutions which afford a suitable medium for their appearance and increase. In the experiments the contents of the tubes were in most cases examined under a high power, and the turbidity, when such occurred, was invariably found to be occasioned by swarms of bacteria. The best index of the development of the bacteria was found to be the degree of turbidity and the time of its commencement.

The first observation recorded is that on April 24, eight ordinary thin test tubes, cleansed with strong sulphuric acid, and thoroughly rinsed with tap water, were partially filled with freshly made unboiled Pasteur's solution,* and

* The following is the formula:—Water, 1500; brown sugar candy, 70; tartaric acid, 4; ammonium nitrate, 4; potassic carbonate, 0·6; ammonium phosphate, 1 solution neutralized with ammonia and filtered.

four were encased in thin sheet lead so as entirely to exclude light, and four were left quite bare. The tops of all were loosely covered with sheet lead capsules, and the whole were placed in a test tube stand outside a window facing south-east, about thirty feet above the ground. None of the tubes were plugged.

On May 4 the tubes were examined as to turbidity. The solution was perfectly clear in the four bare tubes, while in each of the encased it had become distinctly and uniformly milky. This turbidity was proved microscopically to be caused by innumerable bacteria. The bare tubes remained quite clear till May 28. This observation was again and again repeated with similar results.

In the large majority of cases the exposed tubes remained clear for an indefinite time, and in every instance were conserved for a distinct period after their encased companions had become turbid. The most marked differences in the conduct of the two sets of tubes were obtained when the sun shone brightly; when for a period of a day or two at the commencement of the experiment the weather was close and sultry, and the sky dull, the conservative effect of light appeared to be less pronounced. Thus, in an observation started on June 12, it was found on the 14th, that while there was a thick zooglœa and advanced turbidity at the upper part of the solution in the encased tubes, there had already commenced a much slighter but recognizable cloudiness in two tubes filled with the same Pasteur's solution, but freely exposed to the light. This result was attributed to the fact that throughout the whole of the 12th and 13th there was not one ray of direct sunlight, the sky being completely overcast and the atmosphere remarkably thick and hazy.

Observation 2.—On May 5 two of the bare tubes used in the previous observation were taken and the contents were found to be equally and perfectly clear. One was then encased, the other left as before, and both again replaced on the window-ledge for exposure. On the 16th the contents of the encased tube were distinctly turbid, those of the bare tube being perfectly clear.

From this observation the authors infer that the fitness of the cultivation-fluid as a nidus for the development of bacteria is not impaired by the action of light, since the solution which remained perfectly clear so long as it was freely exposed to the sun's rays, swarmed with bacteria after being deprived of the access of light. This being so, it seemed important to determine whether light may exert either directly or indirectly a destructive influence on bacteria. The obvious mode of settling this question would be to protect the tube to be insolated from subsequent impregnation, and finally to encase it. If then it remained clear for an indefinite period it might be fairly inferred that the bacteria had been destroyed, either in their rudimentary condition or successively as they came to maturity.

On May 30, therefore, two tubes were partially filled with Pasteur's solution. Both were plugged with cotton wool and one was encased in paper, the other left bare. On June 5 the encased tube was quite turbid. On June 12, the bare tube, which had remained perfectly clear, was encased, and it continued quite free from turbidity up to June 21. On June 28 the solution was quite clear, but a small tuft of mycelium was growing at bottom. On July 7, when examined with a high power, a mass of matted mycelium, but no bacteria or other living organisms were seen. On July 11 the solution teemed with bacteria, having doubtless been impregnated by the dipping rod used on July 7.

In the next experiment, on May 30, two tubes containing unboiled Pasteur's solution were plugged with cotton wool, capsuled, and insolated until June 21, when both were encased in the way previously described, the plug being withdrawn from one, and the lead capsule replaced. Both tubes remaining clear up to July 2, the unplugged one was impregnated by means of a glass rod dipped in a solution containing abundant bacteria. On July 4 the impregnated solution was distinctly turbid. The plugged tube remained perfectly clear up to the date of writing (October 11).

From these observations the authors conclude that so far as bacteria are concerned the solution may be absolutely and perfectly sterilized by sunlight. It is important to note, however, that in observation 3 the germs of a fungus had apparently survived an amount of insolation which was fatal to the development of bacteria.

Observation 5.—On May 5 two of the tubes used in observation 1 were taken; the contents of the one (encased) were turbid and the other (bare) perfectly clear. The contents were well mixed and divided between the two. They were then exposed as before. On the 8th the contents of the encased tube were much the more turbid; those of the bare tube were but slightly, if at all, more turbid than on the 5th. This experiment was considered to indicate that not only is light inimical to the original development of the individual, but also materially retards the rate of increase, even when the organisms are present in a matured condition. The next observation was designed as a crucial test of this.

Observation 6.—On July 10, seven tubes containing Pasteur's solution were inoculated with a glass rod dipped in a solution teeming with bacteria; care being taken not to impair the translucency of that in the tubes in question. Six of these tubes were then insolated, the seventh being encased. The encased tube became turbid on July 14, the rest remained perfectly clear.

The next object was to determine what period of exposure to light might be sufficient to sterilize a given solution.

Observation 7.—On July 10, seven full-sized test tubes were partially filled with solution and plugged with cotton wool. Six were exposed to the light for periods varying from nine hours to seven days, and were then encased. There was but little direct sunlight upon them during this period, the tube exposed for nine hours having three and a-half hours' sun, and the one encased at the end of seven days receiving in the aggregate about twelve hours of direct sunlight. All, however, were sterilized, while the seventh tube, which was encased from the first, and served as a control, became cloudy with bacteria on the fourth day.

Observation 8.—On July 29, a very hot day, with much sunshine, six tubes (series *a*) containing solution were each inoculated with two drops of a similar solution, which was swarming with bacteria. They were all then plugged with cotton wool, exposed to the light for periods varying from thirty minutes to eleven hours, and encased, the duration of sunlight received in each case being carefully noted. On July 31, four which had received half, one, two, and three hours' exposure respectively, were turbid with bacteria. The other two, which had been exposed, the one for five and the other for eleven hours, were clear at this date, but some days later the former contained some bacteria and a tuft of mycelium with sporidia, while the latter showed a similar growth of mycelium but no bacteria. These tubes had received four and a-half and nine hours' direct and powerful sunlight respectively.

On the same day six tubes (series *b*) containing the same solution, but not inoculated, were similarly plugged, insolated, and encased. These tubes all contained countless bacteria on August 2. This apparently contradictory result is attributed to the fact that for series *a* very narrow tubes, not exceeding a third of an inch in diameter, were chosen, while those of series *b* were about two-thirds of an inch. The fact, however, that in observation 7 a solution was sterilized by an exposure of nine hours, only three and a half hours of which were direct sunlight, whilst in observation 8 (series *b*) the same solution broke down after eleven hours, nine of which were true insolation, is explained by supposing that external conditions—notably temperature—may retard or counteract the preservative quality of the solar rays. The putrefactive tendency of warmth, however, did not, in the authors experience, with this solution at least, over-ride the preservative quality of light; for, provided that there was a full amount of sunlight, tubes exposed *continuously* from day to day were preserved as readily in hot weather as in cool.

In the course of the investigation it was found that, when bacteria appeared early and in large numbers in the solutions used, the mycelium of penicillium or other microscopic fungus was rarely seen, the bacteria apparently preoccupying the ground; when, however, the development of the bacteria was from some cause retarded or prevented, tufts of delicate mycelium were frequently found in the solutions after they had been encased or removed into diffused light. No mycelium, however, appeared during the period of exposure of a solution, except under the conditions hereafter stated, nor, indeed, afterwards, if this were sufficiently prolonged. The authors infer accordingly that light may retard or altogether prevent the appearance of mycelial fungi, but that its influence in this respect is slower and less powerful than upon the schizomycetes. They suggest also that this may explain, in part at least, the sparing distribution of bacteria in ordinary air as compared with the prevalence of the spores of penicillium, etc., a fact, observed by Burdon Sanderson and others.

In the course of the investigation it was found that, within certain limits, the rapidity with which bacteria appeared in the solution was proportionate to its dilution. This is illustrated in the following observation, in which the greater resistance to decomposition of the stronger solutions was utilized for the purpose of ascertaining whether diffused light exerts any appreciable influence on the processes under consideration:—

Observation 9, July 24.—Four solutions were prepared, so that—

I was of the ordinary strength.
II ,, twice as strong.
III ,, $3\frac{1}{2}$ times as strong.
IV ,, 5 ,, ,, ,,

One tube of each solution respectively was placed—

(1) In the dark.
(2) In the diffused light of a somewhat badly lighted room.
(3) In broad diffused daylight.

The result is seen in the following table:—

(1) In the dark,

I became turbid with bacteria.	July 27.
II ,, ,, ,, ,,	,, 28.
III ,, ,, ,, ,,	,, 29.
IV ,, ,, ,, ,,	Aug. 2.

(2) In a dull light,

I became turbid with bacteria.	July 26.
II ,, ,, ,, ,,	,, 28.
III ,, ,, ,, ,,	,, 29.
IV contained a tuft of mycelium.	Aug. 2, and became turbid with bacteria and mycelium, etc., Aug. 5.

(3) In diffused day-light,

I contained bacteria. July 29.
II, III, IV } Remained clear.

The tubes of series 3 were inadvertently exposed to about twenty minutes of sunlight on July 24, but the authors do not think that this materially interfered with the result, which demonstrates the preservative influence of diffused daylight alone, although in less degree than that of the direct solar rays.

Repeated attempts to sterilize a solution one-tenth of the ordinary strength were without success. Whether this failure was due to the unfavourable state of the weather and clouded skies which variably supervened, or whether in a solution of this strength the development of the bacteria proceeds with such rapidity that a warm night in its favouring tendencies outbalanced the retarding influence of the day, is uncertain.

Observation 10, July 26.—Three test tubes were partially filled with fresh urine of a golden sherry tint, and the mouth of each was guarded by a pledget of cotton wool. Two were insolated, one encased. On August 1 the contents of the encased tube were turbid and putrid, but the urine in the tubes which were exposed to the light remained perfectly pellucid. One of these (*a*) was now encased, the other (*b*) was left as before. In about a week two small tufts of mycelium had appeared at the bottom of the tube marked *a*, the solution in which, however, was otherwise perfectly clear. On October 13 the urine in tube *b* was as clear as when the experiment was first started, nor could anything except mycelium with sporilia be discovered in tube *a* on close examination. The urine in this tube had a strongly acid reaction. On the other hand, the urine in the tube which was encased from the first was so offensive as to render the examination of even a drop a disagreeable task. It contained rods and dumb-bells in great numbers and an abundance of the micrococci associated with the ammoniacal fermentation of urea. The reaction was alkaline. Prolonged insolation, it may be noted, had a bleaching effect on the urinary colouring matter.

Observation 11, September 22.—Three capillary tubes were filled with infusion made from some very old hay. One end of each was sealed off, the other end having a small plug of cotton wool. The infusion was of a deep yellow brown colour. Two of the tubes (*a*) were insolated, and one (*b*) encased. A portion also of the infusion was boiled for five minutes in a test tube, the mouth of which was closed during ebullition with cotton wool, the tube (which was labelled *c*) being then placed in the dark. On October 7 each sample was closely examined under the microscope, In the encased tube *b* large numbers of moving rod-like bacteria were seen, but in the insolated tubes *a* a very few moving particles alone were visible. The solution *c*, which had been boiled, contained a large number of rods, of greenish tint, with slightly clubbed refractive ends, for the most part motionless, and usually single. None of these were observed in the capillary tubes.

In some observations with turnip infusion it was found that while it became extremely rotten and offensive in those tubes which were encased, in corresponding tubes exposed to the light it was comparatively odourless, although the development of the bacteria had not been wholly prevented.

In an experiment with zymase, light did not appear to exercise any retarding influence on the "indirect ferments."

The question presents itself, with what rays of the spectrum is this property of light coincident? Is it localized in any one part, or is the unbroken pencil of rays necessary? The most definite result was obtained in an experiment, in which small test-tubes partially filled with solution, made of double the strength, were plugged with cotton wool, then placed in boxes, the sides of which were made of blood-red, yellow, deep blue, and ordinary glass respectively, and exposed to the light on an outside window-ledge facing south-east.

This result pointed forcibly to the active rays of the spectrum as the active agents.

In the course of the investigation mycelial fungi proved to be very prone to appear (to the exclusion of bacteria) in solutions which were themselves of a yellow colour, or were subjected to yellow light. Thus tubes containing urine exposed to light have several times developed a tuft of mycelium either during insolation or afterwards when encased.

This result is attributed to the apparent fact that the less deep shades of yellow allow rays to pass which may at least check the development of bacteria, but are less potent in their influence on the germs of the higher fungi, which accordingly develop the more readily, since they have not to struggle with the former for the mastery. This explanation is in accordance with the inference that, although the mycelial fungi are injuriously affected by light, they are more resistant to its influence than bacteria.

On exhausting tubes containing the solution by means of a sprengal pump and sealing them, it was found that not only did no development of organisms occur under these conditions, but that if the vacuum was maintained for a sufficient length of time, the solution become absolutely barren. Knowing the necessity of oxygen to bacteria (of the ordinary kind at least) and taking into consideration the products of their "respiration," it was inferred that this result was attributable to the absence of oxygen, and consequent asphyxia, not only of the mature forms of those organisms visible to the higher powers of the microscope, but also, it necessarily followed, to that rudimentary "germinal" material which, eluding even the piercing test of the electric beam, is distributed with extraordinary uniformity in almost every water. This fact which had been recently demonstrated by Professor Tyndall, with a similar interpretation, rendered it impracticable to ascertain the action of solar light on Pasteur's solution in a vacuum. By employing urine as the experimental material, however, it was ascertained that urine resisted the sterilizing effects of a vacuum for a period sufficiently long to enable the effects of insolation on this fluid in vacuo to be tested.

In carrying the inquiry further the result was on the one hand, the prevention of bacterial development and consequent growth of mycelial forms (the quantity of light being insufficient for the destruction of these), in those tubes which were insolated in the presence of ordinary atmospheric air. On the other hand, the same urines insolated to precisely the same degree as the former, but in the absence of an atmosphere, became turbid, even in vacuo, with bacteria as early as their encased congeners.

The deductions drawn from these experiments are summed up as follows :—

1. Light is inimical to the development of bacteria and the microscopic fungi associated with putrefaction and decay, its action on the latter organisms being apparently less rapid than upon the former.

2. Under favourable conditions it wholly prevents that development, but under less favourable it may only retard.

3. The preservative quality of light, as might be expected, is most powerful in the direct solar ray, but can be demonstrated to exist in ordinary diffused day-light.

4. So far as the investigation has gone it would appear that it is chiefly, but perhaps not entirely, associated with the actinic rays of the spectrum.

5. The fitness of a cultivation-liquid to act as a nidus is not impaired by insolation.

6. The germs originally present in such a liquid may be wholly destroyed, and a putrescible fluid perfectly preserved by the unaided action of light

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CHEMISTS' ASSISTANTS' ASSOCIATION.

A general meeting of the members of this Association was held in the new room, 29, Brewer Street, Air Street, Regent Street, on Wednesday evening, November 28. There was a full attendance of members and visitors. The chair was taken by the President at 8·30 p.m.

The Hon. Secretary reported the progress of the Association showing that it numbered 60 members and that the funds were in a satisfactory condition.

After a rule had been altered and other business settled, a vote of thanks was proposed and carried to Dr. Dobell for a handsome donation of his complete works towards the formation of a library.

Mr. Marshall then read the following paper :—

Pill Making and Excipients.

On the importance of this branch of the dispensing art, as a convenient means of keeping accurately divided doses of drugs in a portable and permanent form, I need not dwell; nor upon its usefulness for administering those nauseous medicines which are given in small doses, or those heavy mineral powders which are not easily suspended by any fluid. Again, medicines, such as alteratives, required to act slowly, or those the action of which is desired to be retarded until they reach the lower intestines, such as aloes, are best administered in the pilular form.

I will commence by making a few observations on the properties pills (and masses) exhibit, and those they should possess. Pills are liable to absorb moisture and become soft and sticky, sometimes mouldy, at other times they lose their globular form and become flattened or angular, or, again, they become hard and insoluble. In any of these conditions they have failed to be what they ought; substances may have been chosen which ill accord with each other, or are unsuitable for this form of administration, and may not admit of the addition of any simple substance to remedy physical defects. It does not, therefore, necessarily follow that the dispenser is in fault; but with a knowledge of the physical and chemical characters of his materials he may in many cases obviate these objections.

A good pill mass should be sufficiently *plastic* to admit of being rolled or moulded without sticking to the fingers or machine, this condition is dependent on the even balance of two properties : *tenacity* or *adhesiveness* and *firmness*.

Tenacity or adhesiveness is dependent on two conditions—

1st. An inherent property in the particles by which they attach themselves to particles of the same or any other kind.

2nd. A state of partial fluidity, which appears to be essential to the kind of tenacity under consideration. If we deprive otherwise adhesive substances (such as gums, resins, extracts, etc.) of their tendency to fluidity we deprive them of adhesiveness; they become brittle and are readily powdered.

Firmness is that property which enables a mass to retain its shape (therefore of great importance); it may be considered synonymous with hardness and insolubility.

Masses may possess sufficient adhesiveness to form pills, but if all the ingredients are held in a state of solution (*i.e.*, water and gum, or alcohol and resin), that is to say, if there be not a proper proportion of insoluble material present the pills will not retain their globular form, but probably run into a mass.

Again, masses may be so firm as not to take form, in which case they contain too much insoluble material. A pill mass may be said to consist of two parts—*the active ingredients* or basis of the mass and *the excipient* to give the necessary plasticity. The excipient may be active or inert at the will of the prescriber; when inert it is much better left to the judgment of the dispenser by reason of his greater practical experience.

The art of pill making consists in selecting excipients suited to the peculiarities of the other ingredients, and the skill of the dispenser will be shown by the uniformity of his success. Those substances should be chosen which, fulfilling the necessary requirements without inconveniently increasing the size, will not be incompatible with or alter in any way the action of the other ingredients.

Active ingredients (solids) may be divided into *adhesive* and *non-adhesive*; this division is, however, more arbitrary than real, and is only adopted for convevience sake.

Adhesive substances are of very different kinds, varying from powders (such as rhubarb) requiring some simple fluid, acting as a solvent on some of their particles, to develope their tenacity; to extracts (aqueous and resinous) which, when they will not admit of evaporation, need a solid excipient to give the necessary plasticity.

Substances requiring liquid excipients :—

Water and spirit, from their tendency to leave the pills hard and insoluble by evaporation, should when possible be avoided.

Syrup answers better, is more soluble, and the sugar is beneficial in preserving vegetable and other substances liable to oxidation, such as sulphate of iron; it, however, dries and leaves a crumbly mass. The uncrystallizable syrup (treacle) is the best, as it retains its moisture. Both kinds are subject to the objection of sometimes giving too great bulk.

Honey (clarified) is more suited to those substances requiring a small amount of firmness as well as a solvent action, and which will bear a diluent.

Glycerine, the solvent action of which is very extensive, is one of, if not the most important, of fluid excipients; its value is seldom appreciated. Many mineral substances, such as oxide of zinc, subnitrate of bismuth (it being possible to give as much as twenty grains in a pill), oxide of bismuth, antimonial powder, dried sulphate of iron, which show no sign of adhesiveness, form good plastic masses with this excipient and with a very small quantity. Other substances, such as croton chloral, quinine, pepsine, rhubarb, etc., form with it better masses than with any other excipient known to myself.

With regard to rhubarb, I would remark on an error in a well-known work on pharmacy, where one drachm is said to require half a fluid-drachm of water, syrup, or glycerine. It should be half a fluid drachm of syrup or water, and fifteen minims of glycerine.

Glycerine is by many objected to on account of its hygroscopic nature; this, however, may be obviated by the addition of about 15 to 20 per cent. of water, or by spirit, if with spirit it becomes an invaluable excipient for resinous powders, such as jalap (which can be made up with about one-fourth its weight of a mixture of equal parts of glycerine and spirit), and it does not leave the pills hard and insoluble, as when made with spirit alone.

We have in the next place to consider those solid or semi-solid materials, such as extracts, aqueous and resinous, gum resins and resins. As many of these are of good consistence they will not require much attention.

Aqueous extracts when soft (and it being advisable not to evaporate) require absorbent substances. Sugar is sometimes used with advantage, as it absorbs moisture, and helps to preserve vegetable principles. Bread crumb acts as a good absorbent, and the gluten it contains gives the pills firmness. Acacia and tragacanth are too frequently used, but should be avoided on account of rendering the pills hard and insoluble. I do not think tragacanth is so bad as acacia, as it readily absorbs moisture, swells out, and allows the fluids of the stomach to penetrate to the active material; it should, however, be used sparingly as too much makes the pills retentive of shape; they may be readily stretched or squeezed in any given direction, but on removal of the influencing force resume their former shape.

Resinous extracts and gum resins when soft require drying materials, of which several kinds are in use. Sometimes acacia and tragacanth are used, but not with a happy result, or magnesia, of which a small quantity suffices (but should never be used, as it renders resinous matters hard and insoluble), powdered liquorice, phosphate of lime, and fine sifted sawdust are also used, and answer well.

When dry or hard, spirit, or if this gives them a tendency to fall, something of an emulsifying nature answers better, such as liquor potassæ or soap; for gum resins carbonate of potash has been recommended. Resins are substances capable of having their tenacity developed by some simple fluid, such as spirit or volatile oil, but as they are wholly soluble in these liquids masses so made would not be sufficiently firm. An emulsifying substance, such as soap, soft or hard, is more suitable, and renders them more soluble.

Non-adhesive substances, or those to which adhesiveness must be imparted, such as digitalis, conium, ipecacuanha, crystalloids, and mineral powders like calomel and tartar emetic.

The adhesive substances in use (and recommended) are various—honey, confection of hips and roses, glycerine of tragacanth, extract of liquorice, manna, bread crumb, and borotartrate of soda.

Confection of hips and roses, both containing sugar, exert a preservative influence on vegetable substances. The former is used in one official formula (pil. quinæ), probably chosen on account of its slight non-astringent acidity, which enables it to bind the quinine, but, even in the proportion the Pharmacopœia says is sufficient, would in many cases be far too bulky; glycerine answers better, and makes an exceptionally good mass. Confection of roses containing astringent matter is best fitted for astringent extracts, powders, etc.; it is used in several official pill masses, especially in those containing aloes, where firmness is desired as well as tenacity, and in those containing iron preparations. Its utility in these cases has been called in question, as it dries and soon leaves hard or crumbly masses; it certainly seems unfortunate that it should have been chosen in those masses containing iron, for the blackening of the masses shows that some action takes place. As a substitute for confection of roses in these masses, glycerine of tragacanth has been proposed. Without detailing these cases I would suggest that with the iron masses honey be used, as the sugar prevents the iron from oxidizing, it forms a fair mass which retains a brown colour.

Manna and crumb of bread are used with mineral powders, which are given in small doses, such as calomel and tartar emetic, and which require a diluent. Manna answers well and has no chemical activity, bread crumb becomes dry and hard.

Glycerine of tragacanth, by reason of its great tenacity and retention of shape, is in great favour as a dispensing excipient for vegetable and mineral powders, whose bulk will not admit of much excipient. Different forms are in use, varying from one part of tragacanth to five, seven, and nine of fluid, this latter being either glycerine alone, or diluted with water in about the proportion of two parts glycerine and one of water; that with water having a superior tenacity and being less hygroscopic is generally preferable; but with crystalloids (as sulphate of iron or zinc) that made with glycerine alone answers better.

I prefer, myself, to add to these substances glycerine sufficient to damp them, so as to let it have the full play of its solvent action, and then add tragacanth; in this way the materials may be more easily manipulated, and as a rule, a smaller quantity of tragacanth suffices. Borotartarate of soda is a substance that has been recommended for crystalloids and mineral powders, but my experience with it has not been very satisfactory. Resinous excipient has been recommended by Mr. Proctor for crystalloids, and in those cases in which I have tried it it answers well.

Oleo-Resins and Volatile Oils.—Balsam of copaiba being the type of the former, magnesia and hydrate of lime are the excipients recommended, as they form soaps with the resin which absorb the oil, but make such hard masses that they pass through the stomach into the fæces unacted upon. This seems to be the general action of magnesia with resins, therefore it is better avoided in all cases. Beeswax solidifies it, as also does spermaceti and cocoa butter. It is fortunately now never given in the pilular form, but as it is frequently given in the form of an electuary a little spermaceti will be found useful in absorbing the oil, instead of the large quantity of gum and sugar generally used.

Volatile oils also require absorbent and drying materials (with the exception of camphor). Bread crumb is useful for small quantities, magnesia and soap, or beeswax (which is objected to on account of its insolubility) combined with soap, phosphate of calcium or magnesia is used where larger quantities of oil are prescribed. I would here draw attention to the solidifying power of cocoa-butter and spermaceti, as I have found them useful in solidifying considerable quantities of oil when soap is combined with them, and having a low fusing point they are easily reduced by the stomach.

There are certain substances which could not be well tabulated with any of the foregoing.

Camphor, for which the orthodox excipients are castor oil, suet, and soap. Whilst speaking of camphor I would remark (without in any way advocating its use) on its aptitude for forming chloral into pills; one gr. of camphor making up forty grains of chloral.

Phosphorus, for which several solvents are recommended, such as suet, cocoa-butter, resin, and the mixture of balsam of tolu and wax of the Pharmacopœia. To their number I would add spermaceti. Phosphorus can be readily dissolved in this by simply melting and agitating them together in a test-tube, plugged with wool or tow; it should be allowed to thoroughly solidify before exposure to the air. The product can be readily powdered with a little spirit and it will be found very convenient for dispensing purposes.

With regard to manipulation time will not allow me to give more than a few (commonly known) general observations; such as the reduction of friable material (crystalloids, dry extracts, &c.) to powder, the thorough mixing of powders and the advisability of first moistening them when they have to be incorporated with tough hard extracts, and again the need of adding all the excipients at once with other substances. Any further information will be best acquired by practical experience with the various substances met with at the dispensing counter.

A lively discussion then followed in which Messrs. Naylor, Stuart, Hoskin, Wallis, Glover, Coles, etc., took part.

The thanks of the meeting was accorded to Mr. Marshall for his interesting paper. In consequence of the lateness of the hour, the reading of a paper by Mr. Stuart was postponed for a fortnight.

Several microscopes, elastic batteries etc., were exhibited and examined by the members and their friends.

PHILADELPHIA COLLEGE OF PHARMACY.

A meeting of the College was held on the 19th of November, the Vice-President, Mr. C. Bullock, in the chair.

Mr. Mattison called attention to some specimens of malt extract, showing the effects produced by long continued heat with atmospheric contact, in contrast with those obtained by evaporation by means of a vacuum pan. In the former case the heat attained was about 220 to 225° F., and the extract was of a dark-brown colour, transparent, very sweet, and evidently contained much sugar; in the other case, the temperature never rose above 130° F., and the extract obtained was light-brown, somewhat opalescent, less sweet, and contained nearly all the dextrin unaltered.

Professor Maisch said that dextrin was easily altered by heat, which accounted for the different appearance of the two extracts; but from this it did not follow that the officinal extracts, made by the pharmacist by the aid of judiciously applied heat, must necessarily be impaired by this treatment and inferior to those made in vacuo; while the colour did change from the alteration of the extractive, the virtues of the extracts were still retained.

Mr. Shinn stated that with proper and efficient refrigeration the evaporation of tinctures in the pharmaceutic still, introduced to the notice of pharmacists some twenty-five years since, proceeded much faster than in the open air with constant stirring of the liquid.

Professor Maisch showed the white incrustation of the branches of a shrub from Hot Springs, Arkansas; the incrustation, obtained by immersion, in the spring waters, consisted principally of carbonate of calcium, with traces of iron, some magnesium and notable quantities of lithium.

Mr. Shinn presented a specimen of "rock soap" from California, which, mixed with an equal quantity of soap, is employed there as a detergent; it was thought that in composition it was a silicious talc.

Mr. Neppach stated that a similar article was obtained on the coast of Oregon.

Mr. Bullock gave some account of the seeds of *Sophora speciosa*, in which an apparently new alkaloid has been recently observed by Professor H. C. Wood, jun., Philadelphia. One-half of a seed is said to be sufficient to produce delicious exhilaration, followed by a sleep lasting one or two days, and a whole seed is sufficient to kill a man. Through the kindness of a correspondent, in San Antonio, Texas, Mr. Bullock had obtained a sample of the seeds which he exhibited. They are somewhat irregular in shape, with a general disposition to an oval form, the large ones having a longitudinal diameter of $\frac{60}{100}$ of an inch, and a transverse diameter of $\frac{45}{100}$; their colour varies from pale to dark red; the testa is horny, from $\frac{3}{100}$ to $\frac{5}{100}$ of an inch in thickness; the interior is a white oily kernel, having a slightly bitter taste. The seed yields its colouring-matter to dilute but not to strong alcohol; nor has it yet been determined in what part the medicinal activity of the bean resides, but the probability is that it is in the testa. The seeds are contained in a pod of yellowish-brown colour varying from 1 to $2\frac{3}{4}$ inches in length, and enclosing from one to five seeds.

A sample of berries was exhibited by a member present to whom they had been sold as nutgalls; they were recognized by Professor Maisch as orange berries or small immature oranges.

Mr. Boring exhibited a specimen of fluid extract of glycyrrhiza, made by a process of insuccation, published by Mr. H. Biroth in the Chicago *Pharmacist*, his method being essentially the exhaustion of 16 troy ounces of the concised root with 4 pints of water containing 8 fluid ounces of glycerine, followed by another 4 pints of water, and the whole evaporated to the measure of a pint. The objection to this process was the unnecessary amount of evaporation required to bring it to the proper bulk.

This preparation induced considerable discussion relative to the best means of disguising the taste of bitter medicines, particularly that of quinia. Professor Maisch asked whether the members had noticed the occurrence of a precipitate on mixing aqueous solutions of quinia and ammoniacal glycyrrhizin. Mr. McIntyre stated that it had been noticed by him, and Professor Maisch suggested that this might in part account for the tastelessness of the mixture. Mr. Boring stated that it was very important to exclude all alcohol from the quinia mixtures where the taste had to be masked.

Parliamentary and Law Proceedings.

Salt in Beer

On Wednesday, December 19, at the Thames Police Court, James Scott, landlord of the Wellington beerhouse, St. Leonard's Road, Bromley, was summoned at the instance of the Metropolitan Board of Works for the Poplar district, for selling beer adulterated to the extent of 63 grains of salt to the gallon. Mr. Charles Young, solicitor, appeared for the prosecution on behalf of the Board; Mr. Besley, barrister, for the defendant.

William Harrison, one of the inspectors of nuisances to the Board, said that on Thursday, the 29th ult., he went to the Wellington beerhouse, St. Leonard's Road, Bromley, kept by the defendant, and asked his wife, who was serving behind the bar, for a pint and a half of porter. He was served, and then told the wife that he had purchased it to have it analysed. He also applied for a pint of fourpenny ale, but was told it was thick. A few minutes afterwards the defendant entered the house and went into the cellar, and shortly afterwards his wife served the witness with the liquor applied for. He divided it into three parts, and did the same with it as he had done with the porter.

Mr. William Young, analyst to the Board, said that on the 29th ult., he received a sample of porter and ale from the last witness to be analysed. The certificate produced was his, and he there stated it was adulterated to the extent of 63 grains of salt per gallon. In cross-examination by Mr. Besley, the witness said he had never made any beer, but had seen it made. He did not know how much salt there might be in hops. He was not aware of the natural quantity of salt in Burton water. He found that a pot of Truman and Hanbury's strong ale contained 16 grains of salt.

Mr. Charles Heisch, consulting chemist to the Corporation of London, said he found 66 grains of salt to the gallon in the porter, and 70 in the ale. He did not say its presence would be injurious to health. He could not tell the quantity of common salt or the amount of hops used in a gallon of beer.

Laurence Burleigh, head brewer at Truman and Hanbury's, Spital Fields, said he had been in their service over 30 years, and had sole charge of the brewery department. All articles used in the brewery department would come under his personal cognizance. Salt was not bought or used in any shape or form. Saccharine matter was imported, and the duty paid to the Excise. Breweries were always open to inspection. Ale contained hops, saccharine matter, and water. He found some ale of the same brewing as that which had been sold to the defendant. That brewing he superintended. There was no salt put into it, and he did not dare to use bad water. Saccharine matter was not used in ale to the extent it was in porter. No salt whatever came on the premises for brewing purposes. In reply to Mr. Young, the witness said the firm used Hartley's deep-well water and the East London water. He had heard that on some water they had used being analysed three and a half grains of salt to the gallon had been detected. In answer to the magistrate the witness said he had heard country brewers used salt to some extent, but London brewers did not. If it were used to a large extent, it would spoil the beer. The quantity of malt they used was rather more than one half, the other half was saccharine matter.

Mr. Dugald Campbell, an analyst, said he was well acquainted with the ingredients used in brewing beers, and he was surprised at not more than 63 grains of salt being found in the samples referred to. The salt was attributable to the hops, malt, and saccharine matter.

Dr. Henry Bartlett gave similar evidence.

John Scott, the defendant, was then sworn, and said he did not put a particle of salt in the beer.

Mr. de Rutzen said that before he decided the case he wished to see the invoice delivered with the beer to the defendant. He adjourned the case for two weeks.—*Times*

Review.

Year Book of Pharmacy, comprising Abstracts of Papers relating to Pharmacy, Materia Medica, and Chemistry, contributed to British and Foreign Journals, from July 1, 1876, to June 30, 1877. With the Transactions of the British Pharmaceutical Conference at the Fourteenth Annual Meeting held in Plymouth, August, 1877. London: J. and A. Churchill. 1877.

Many readers of this Journal will be pleased to learn that within the next few days they may expect to be in receipt of the green-covered 'Year-Book,' if indeed it has not already reached them. The new volume corresponds in so many respects to those of former years, and Mr. Siebold's work is now so familiar to the members of the Conference, that the time has passed when special criticism would be necessary in the absence of any novel feature; unless indeed it were to repeat in spirit the criticisms of former years.

The "Introduction," to which probably the attention of most will be first turned, is an ably written *résumé* of the pharmaceutical literature of the year specified, as far as it is represented in the 'Year-Book; in fact, it is good enough to raise the desire for more, and also the inquiry whether there is any inflexible rule that limits the Introduction to sixteen pages, neither more nor less. We say the literature as far as represented in the 'Year-Book,' because this is scarcely done so exhaustively as in former years, unless, contrary to our impression, pharmaceutical literature is falling off in quantity or quality, or both. We notice no diminution in the usual fulness of the abstracts, which, by the way, are as good as ever, whilst some articles are noticed that did not appear until September last, or three months beyond the date on the title-page; nevertheless, this section of the 'Year-Book' has fallen off from 404 pages in 1874–75 to 341 in 1876–77. Of course there may be ample reason for this in the editor's judgment as to how much of the ephemeral literature of pharmacy should be placed on record in the more condensed annual volume. If, however, it be due to a desire to confine the volume within certain bounds, we think there are many pages of lists of names, etc., that might be better excluded. For instance, 67 pages, or more than one-tenth of the whole volume, are devoted to recording the names of the members twice over, and a whole page is sacrificed to the names of twelve exchange journals, one of which happens to have ceased to exist twelve months since.

The 'Transactions' have been seen through the press by Professor Attfield with his usual care, and, on the whole, the new 'Year-Book' worthily keeps up the reputation of the series.

Dispensing Memoranda.

We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be considered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.

[46]. Ung. Galeni.—The formula of the French Codex for Ceratum Galeni, or Galen's Cerate, is as follows:—

℞	Aquæ Rosæ	3 oz.
	Ol. Amygd. Dulc.	4 oz.
	Ceræ Alb.	1 oz.

Heat in a water-bath the wax, oil, and half the rose-water, until the wax is melted; pour into a warm marble mortar and stir the mixture continually. When nearly cold beat in briskly, little by little, the remainder of the water.

Walter A. Powell.

[46]. UNG. GALENI.—In answer to query No. 46, in *Pharmaceutical Journal* of this date, "Ung. Galeni" is cold cream.

J. B.

Cheltenham, December 22, 1877.

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[46]. UNG. GALENI.—An Apprentice will find "Ung Galeni" to be an old-fashioned term for "cold cream," (*vide* Beasley, "Ceratum Galeni").

Maidstone, Dec. 24, 1877. G. P. L.

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[46]. UNG. GALENI.—The following is a formula for Unguentum Galeni, taken from Dr. Liveing's book on 'The Treatment of Skin Diseases.'

℞. Ol. Amygdalæ . . . . lb. j.
Ceræ Albæ . . . . oz. 4.

Melt, pour into a warm mortar, and add gradually

Aquæ Rosæ . . . . oz. j.

It should be very light and white.

E. T. G.

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[49]. If H. J. H. will put his Liq. Ferri Mur. into the bottle, add the water and the Sp. Chlorof., shake, and then add the Liq. Ammon. Acet., and again shake, he will have a clear mixture. Probably his Liq. Ammon. Acet. contains excess of ammonia which would precipitate the iron as hydrate, and of course give a cloudy appearance to the mixture.

PHAINO.

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[49]. There is nothing to prevent the mixture being clear if the preparation answer the B. P. tests. If the Liq. Ammon. Acet. is alkaline the result will be a turbid mixture. I have dispensed the prescription and never failed to obtain a perfectly clear mixture.

M. P. S.

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[50]. EXT. ERGOTÆ LIQ.—In answer to query No. 50, I have no doubt that "Young Pharmacist," if he examines the crystals obtained from the ergot extract, will find them to be acid phosphate of potassium, and if he refers to the *Pharmaceutical Journal* of April 10, 1875, he will observe that in a paper on liquid extract of ergot I have made reference to the formation of these crystals.

I may here mention that I consider the presence of these crystals indicate the good quality of the preparation and I have never failed to obtain them in my home-made extract.

A. W. GERRARD.

University College Hospital.

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[50]. EXTRACTUM ERGOTÆ LIQUIDUM.—The crystals found at the bottom of the bottle containing the extract consist of Potassæ Sulphas. The cause of their presence is the digestion of the ergot with water at 160°; they are not to be found, or only traces of them, in the liquid extract used in France, where it is prepared with cold water.

HUGO W. LANGBECK.

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[51]. A prescription, of which the enclosed is a *verbatim* copy, was brought to me to be dispensed.

On examination I concluded that the *ounce* of liquid extract of ergot ordered was merely a slip of the pen, therefore I only put a *fluid drachm* into the mixture.

On communicating with the physician next day, he informed me that he very frequently gave ergot in one ounce doses, as *per* prescription, and that there was no error on his part.

I shall be glad if any reader of the Journal will inform me through its columns, if he would have dispensed the prescription as the medical man had intended.

℞ Ext. Ergotæ Liq. . . . . ℥j.
Tr. Opii . . . . ʒj.
Aquæ . . . . ad ℥ij.
M. ½ statim sumend.

CHARLES STOCKS.

Port Elizabeth, Cape Colony.

Notes and Queries.

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[570]. INCENSE. ESSENTIA FORMALIS.

℞ Olei Caryophyllorum,
„ Cassiæ cinnamonis,
„ Citri,
„ Lavandulæ,
„ Macidis, āā drachmam dimidiam.
„ Bergamottæ drachmam.
Balsami Peruviani,
Essentiæ Moschi, āā unciam dimidiam.
Tincturæ Tolutanæ drachmas duodecim.
Benzoini drachmas tres.
Spiritus rectificati uncias decem.
Misce, seponi et filtra.

HUGO W. LANGBECK.

SYR. FERRI IODIDI.—Having found a difficulty in having syr. ferri iodidi constantly in good condition, owing to the uncertain demand for it in a country business, I, about this time last year, tried an experiment, and having succeeded in my object, send you the result in the hope that, if sufficiently important to obtain publicity, it may be useful to others.

Having prepared a supply of the syrup, according to the formula in B. P., I filled three 2oz. bottles with the product while hot, and numbered them 1, 2 and 3. No. 1 I placed in a situation where it was at intervals exposed to direct sunlight. Nos. 2 and 3 were put in the dark, the former cork upward, the latter inverted. After the interval of twelve months I find, No. 1 colourless and with a dark deposit; No. 2 (cork upward), has a deep iodine colour; No. 3, of a pale green colour except a slight red tint, where the syrup was in contact with the small quantity of air in the inverted bottle, and which, on being shaken was not sufficient to perceptibly tint the quantity of syrup.

The result of my trial is that I shall in future store syr. fer. iodid. in small vials of the long series (bottling it while hot), and keep the bottles inverted in the dark, and I expect always to have the preparation in good condition.

When I wrote colourless of No. 3, I referred to the absence of red colour; No. 1 was as nearly as possible white.

T. STOKOE.

Clare, Suffolk.

LIN. HYDRARG, B.P.—The unsatisfactory appearance of the Lin. Hydrarg., B.P., led me some time ago to try to invent a preparation which would combine the character of a stimulating liniment with the presence of mercury in solution in oil. I then found that by precipitating a solution of perchloride of mercury of suitable strength with an excess of sapo durus an oleate was obtained which readily dissolved in oil. A solution of this salt in Lin. Camph. would probably answer as well as the Lin. Hydrarg, B.P., while at the same time it would be easier in preparation, more uniform in strength, and unobjectionable in its appearance.—"EXPERIENTIA DOCET."

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[571]. BLUE COLOUR.—Wanted the best form for Blue Colour for show bottles that will not deposit.—W. T.

[572]. DR. COFFIN'S ANTI-SCORBUTIC POWDER.—Would any one please give a formula for Dr. Coffin's Anti-Scorbutic Powder?—ENQUIRER.

[573]. SILVERING LIQUID.—Will you kindly tell me of a good *liquid* for *silvering* (without mercury or its salts), so that by dipping any little trinkets, etc., in it they will have the appearance of silver, which will not wear off?—C. H. A.

BOOKS, PAMPHLETS, ETC., RECEIVED.

EXPERIMENTAL RESEARCHES IN PURE, APPLIED, AND PHYSICAL CHEMISTRY. By E. FRANKLAND, Ph.D., D.C.L., F.R.S., etc. London: J. Van Voorst. 1877. From the Author.

ÉTUDE SUR LES LIQUIDES PATHOLOGIQUES DE LA CAVITÉ PÉRITONÉALE. Par le Dr. C. Méhu. Paris: P. Asselin. 1877. From the Authors.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE RECENT PROSECUTIONS UNDER THE PHARMACY ACT.

Sir,—In inviting opinions upon the case reported in the Journal, p. 496, Mr. Cock sets a somewhat difficult task. The press is presumably impartial; the defendant's letter may be considered, without offence, *ex parte*, and the facts are variously stated by the two authorities. The charge reads that the defendant "did sell a preparation of poppies made up in a compound called 'Syrup of Fox's Lungs;'" the letter states that a bottle containing syrup of poppies was produced, and Mr. Cock does not dispute the identity of the material. The report states that two witnesses swore to having seen a bottle labelled "poison," but failed to identify it; the letter states that they saw a "poison" label on the bottle, the difference in the grammatical "article" being very material to the case. Syrupus papaveris and syrupus rhœados may be equally "syrup of poppies" in the eye of the law, and may alike require to be labelled "poison." There is an ambiguity in the report and the letter which leaves us in doubt which article was sold, but as nothing appears to have been said about the comparative inertness of the syrup it may be inferred that syrupus papaveris was supplied, although that is not the preparation usually sold for "Syrup of Foxes' Lungs," at least in these neighbourhoods where it is asked for about once in a blue moon. The fact may make no difference in law but it might influence "opinions."

The case shows the insufficiency of separate "poison" labels, particularly for syrup of poppies, which customers will often request may not be labelled so ominously, and when the word "poison" is placed in the centre of a "slip" it is often scratched off, and when separate is sure to be removed. Baby-farmers and mothers who administer narcotics do not like the fact to be placed so nakedly before their own and their friends' eyes.

Indirectly, this incident reads a lesson upon the not unusual but slovenly habit of affixing label upon label, often very slightly adhesive and easily removed. The mother has a mixture, the father a dose of spirit of nitre, the baby again some syrup of rhubarb, and finally syrup of poppies, and four labels, three of which may be easily removed by busy little fingers, testify to the successive uses of the bottle. I have peeled off five labels one after another before now, either of which being removed would bear false witness to the contents of the bottle, and might possibly get somebody into unnecessary trouble.

Taking the facts as Mr. Cock states them, they illustrate the manifold dangers to which a chemist is daily exposed, for we have no guarantee that medicines most carefully dispensed may not be transferred for convenience (the bottle proving perhaps very useful for some other purpose) into another with a very inappropriate label. A short time ago I took up a bottle in a house evidently containing a very poisonous composition, but to which a clean label was still attached, directing a sixth part to be taken three times a day. Our reputation hangs upon a slender thread sometimes. A few months since I was called hurriedly to a person who had taken poison. A physician had been applied to and the label shown to him, and he had referred the parties to the chemist. A woman had taken from the corner of a cupboard a parcel, which she supposed to contain Epsom salt. She did not read the label, the appearance was sufficient for her, and she took a dose and gave a dose to her daughter, and threw the paper into the hearth. Beginning to feel unwell she searched for the paper and found it labelled "Sulphate of zinc—poison." The packet of Epsom salt was still in the cupboard; but despite its presence there, if the label of the salt taken had been thrown into the fire instead of the hearth and had got burned, to say the least, I should have fallen under the suspicion of having supplied a wrong article and, in the event of serious consequences might have had a censure with its baneful effects. *Per tot discrimina rerum*—with increasing dangers and diminishing rewards—the chemist of to-day follows his difficult calling. We need extraordinary care and mutual help.

HENRY H. POLLARD.

Ryde, December 24, 1877.

Sir,—Mr. Cock's case does seem a hard one, and tends to show the necessity of sending out all poisons in properly labelled bottles.

Could not some of our enterprising glass houses introduce bottles of various sizes—either blue or black—with the word "Poison" in raised letters upon them? If this could be done in white upon a blue or black ground so much the better, but the other would suffice to meet the requirements of the Pharmacy Act.

WM. ROBERTSON.

Elgin, Dec. 22, 1877.

A SUGGESTION.

Sir,—I was highly gratified in reading over the account of the proceedings at the Edinburgh Assistant Chemist's Supper to find that the desirability of organizing a permanent association had been mentioned by one of the speakers. This would certainly be a step in the right direction, as such an association by bringing the assistants into closer contact with each other could not fail of being attended with highly beneficial results. The many grievances connected with our profession of which we frequently complain, including those all important too long hours and no time for study, cannot be remedied until as the result of having an association there will exist a better understanding between the assistants, and efforts put forth for their redress be more united. The status of the Edinburgh assistants might also be adduced as another strong reason for promoting such an association. It is a matter of surprise to many connected with and interested in our trade, that in such an important city as our own, at once the capital and centre of pharmaceutical knowledge of Scotland, there should not have been organized long ago an association worthy the name and prestige of Edinburgh assistants. For these and many other reasons therefore it is very much to be desired that, the subject having at length been mooted, some of our older and more competent members will take the matter in hand, and thus place the Edinburgh assistants on at least an equal footing with their brethren in Glasgow, Manchester, Leeds, etc., where associations of the same nature have not only flourished, but exceeded the most sanguine expectations of their promoters.

J. F.

Edinburgh, December 24, 1877.

R. H. Tickler.—All the information respecting Syrup of Lactophosphate of Lime in our possession has already appeared in the Journal. See vol. vi., p. 883, vol. vii., p. 1041, etc.

Erratum.—On p. 500, col. ii., line 3, *for* "box and pills" *read* "box of ills."

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Pocklington, Mr. Robertson, Mr. Barrett, Querist, B. N. S.

SANGUINAIRE OR THÉ ARABE.

BY JOHN R. JACKSON,

Curator of Museums, Kew.

From time to time new products of the vegetable kingdom come to light, and new applications of different parts of plants are brought to our notice. New pharmaceutical products have of late been by no means rare; whether, however, these products have or have not any real value is a question upon which authorities are for the most part entirely disagreed. It is well known that the leaves of many plants are applied in different countries for making infusions for use as tea, and indeed are generally known as tea. Some of these have been before referred to in previous volumes of the *Pharmaceutical Journal*, but a sample of a substance new to me has recently been received at the Kew Museum under the name of "Sanguinaire or Thé Arabe." This tea is recommended for use more as a medicine than as a refreshing beverage. It is prepared at L'Arba in Algeria, but is also sold in Paris, by M. Hugot, 19, Rue Vieille-du-Temple, as well as by all druggists. It is neatly done up in packets, on the front of which is a description of its virtues in French, and similar description occurs on the sides in English, German, Italian and Arabic. The English description is as follows:—

'ALGERIAN TEA.—The plant which is used to make this preparation grows on the arid slopes of the Atlas mountains. The flowers and some of the small leaves are dried, and the infusion made from them has a pleasant taste and is decidedly beneficial in its action in all cases of colds, catarrhs, and chest affections. Algerian tea is exceedingly useful in alleviating fevers and in contributing to the enriching of the blood. It is much recommended to persons suffering from a feeling of oppression at the chest, or from any difficulty of digestion. Its daily use after meals gives tone to the organs, and regulates all the functions of the body. A tea spoonful is sufficient to make a breakfast cup of the infusion."

With regard to the medicinal properties, if any, of this tea, I am quite unable to give an opinion, but so far as its "pleasant taste" is concerned my experience of a teaspoonful in a breakfast cup of boiling water, as directed, resulted in an infusion with scarcely any colour and but very little smell, reminding me rather of boiled hay. The flavour, which was not very marked, was herby rather than aromatic. As found in the packets, this tea is composed simply of what at first sight seems to be the flower-heads of a species of *Helichrysum* or some allied composite, but upon closer examination the large silvery bracts are found to belong to the flowers of a species of *Paronychia*; and upon still closer examination and comparison the species appears without doubt to be *Paronychia argentea*, Lam., a plant widely distributed through the Canary Islands, Spain and the Mediterranean region. Though the name of the plant furnishing this tea is not referred to on the packet, a private letter that accompanied the sample forwarded to Kew, states that two species of *Paronychia* are used, namely *P. argentea* and *P. nivea*, and that the term "Thé Arabe" by no means distinguishes this particular kind, inasmuch as it is given also to infusions of *Globularia Alypum*, *Cistus albidus*, and *Verbena triphylla* or *Aloysia citriodora*.

NOTES ON INDIAN DRUGS.

BY W. DYMOCK.

(*Continued from page* 485.)

ASCLEPIAS CURASSAVICA.—*Local name*, KURKI.

Common in gardens, and in some places has run wild. It has a woody branching root, with light brown bark and numerous fibres, wood white, bark thin. When fresh it exudes a milky juice. The taste is bitter and somewhat acrid. A section of the root bark placed under the microscope shows from without inwards, 1st, a suberous layer; 2nd, several rows of large cells containing conglomerate raphides, with starch and granular matter; 3rd, a vascular zone, two or three large dotted vessels being situated at the cambium end of each medullary ray where it projects into the bark.

LEEA sp.—*Local name*, GEENO.

This is the root of a stout undershrub with large pinnate leaves, very common in Goa. The roots are long and straight, branched; the bark is slightly scabrous, dark brown externally, striated; internally it is red and striated; the wood is porous, and shows very distinct medullary rays. Microscopic appearances not in any way remarkable. The bark has an agreeable astringent taste; the wood appears to be inert. Geeno is the Ratanhia of the Portuguese at Goa, and has a considerable resemblance to that drug. It is administered in diarrhœa and chronic dysentery.

LAURACEÆ, Gen. ? Sp. ?—*Local name*, MIRIO.

A tree. The leaves have a pleasant odour of cinnamon. The bark is very scabrous and of a rusty brown colour; when freshly removed it is dirty white and very mucilaginous internally, but soon becomes of a dull brown colour from exposure. Microscopic examination shows no remarkable peculiarity. The liber cells are very large. The parenchyma is composed of mucilage cells. The taste is feebly bitter and very mucilaginous; when the dry bark is soaked in water the inner surface becomes covered with a thick mucilage like white of egg. Mirio is used in Goa as a demulcent and is given in bowel complaints; its properties very closely resemble those of "Maida Lakri," the bark of *Tetranthera Roxburghii*.

ACONITUM sp. ?—*Local name*, JUDWAR.

The history of this drug is beset with many difficulties on account of the vague meaning of the term Judwar, the name by which it is generally known, and appearing properly to mean zedoary. Under judwar the author of the 'Makhzan ul Adwiya' gives Antila as the Arabic name, and Saturyoos as the Greek. The Indian name, Nirbishi, he explains as Nir the antidote to, Bish the poison.

He describes five kinds—

1st. Khatai; black externally, violet brown internally; scorpioid, knotted, tasting sweetish at first, afterwards very bitter.

2nd. Outside and inside brown or yellowish-brown, bitter, scorpioid.

3rd. Outside and inside black; when rubbed down it has a bluish tinge; bitter. This, and the second kind come from Thibet, Nepal, Morung, and Rungpore.

4th. Blackish; bitter; size of an olive; comes from the Deccan Hills.

5th. Spanish, called Antila; black, soft, very bitter.

Of these the first kind is said to be the best.

It would appear, then, that the term judwar has at different times been applied to various tuberous roots supposed to have alexipharmic properties, and that in India it is applied to the root of an aconite known from an early date to the Hindus as nirbishi. Native medical works abound in absurd stories concerning this article and its wonderful power as a tonic and alexipharmic; it fetches a high price, and is generally kept in metallic mercury to preserve it from insects. What is considered to be genuine judwar in Bombay consists of small black-brown tubers, some irregularly ovoid, some conical, seldom more than one inch long and half an inch in diameter; they are somewhat wrinkled, and bear a few horn-like projections, which are the remains of rootlets; at the crown there is a scaly leafbud. When in good condition the tubers are softish, and cut like a piece of dry liquorice extract, the colour being a uniform brown-black throughout. To the naked eye the cut surface appears structureless; it has a somewhat fruity smell, and is very bitter. A transverse section examined under the microscope shows a dark brown epidermis, composed of compressed cells, an outer ring of parenchyma, the cells of which contain starch granules, and much brown granular matter; within this from 5—10 vascular bundles, connected together by a cambial zone, made up of several rows of small dark brown cells; the position of the bundles is very irregular, consequently the zone has a peculiar waving course. In the central portion of the tuber starchy parenchyma is again met with; the starch has not been affected by heat. Judwar comes to Bombay from Delhi; it is worth about rs. 10 per pound, but is retailed here for double that price.

COPTIS TECTA.—*Local name*, MAMEERAN.

Two distinct varieties of this drug are met with in the Bombay market. The kind most esteemed is a yellowish rhizome as thick as a crow-quill or larger, having a few spinous projections where rootlets have been broken off. The whole rhizome is jointed; but at the upper end the joints become much more marked and a stem-clasping petiole often remains attached to each of them. The second kind is as thick as a goose-quill and covered with thin wiry rootlets. It often branches at the crown into two or three heads, which terminate in a tuft of leaf stalks that are crowded together and never separate as in the first kind. The rhizomes of both kinds are contorted and break with a short fracture. The centre is spongy and the surrounding portion bright yellow and woody. Taste purely bitter. The first kind corresponds with the description of Coptis root in the 'Bengal Dispensatory,' the second with the description of that drug in the 'Pharmacographia' and with all the descriptions of *Thalictrum foliolosum.* The bark of the second kind is much the thickest, and is softer and more corky than that of the first; in both bundles of orange-coloured sclerenchymatous cells are present, and the medullary rays contain starch. The wood is arranged in distinct wedge-shaped bundles, round a central parenchymatous portion having a structure similar to that of the inner cortex. Both kinds of the drug come to Bombay, from China *viâ* Singapore in bulk. The first is worth $3\frac{1}{4}$ rupees per pound. The second 2 rupees.

(*To be continued*).

ÆGLE MARMELOS OR BAEL.*

BY SIR J. FAYRER, M.D.

A short notice of Goa powder had the effect not long ago of attracting attention to, and I hope of extending the utility, in this country, of a remedy much used and valued in India in the treatment of certain forms of skin diseases. I should be glad if a similar result were to follow notice of another Indian remedy that would, I think, also be appreciated and valued were it properly tried—I allude to the ægle marmelos or Indian bael fruit. Of course, I know it is now to be found in most English dispensaries, and that it is perfectly well known (by name) to physicians in this country; but this is in the dry form, when it is old and desiccated, the essential oil and aroma dissipated, and all the merits of freshness gone, in which condition it is probably inert,—or in the form of the fluid extract of the Pharmacopœia, of doubtful efficacy.

Steamers come from Bombay in twenty-six days, and there is no reason that I know of, why they should not bring the bael fruit quite as fresh and fit for use here as in India; and it is only when fresh and nearly ripe that it is of any real value. In this state it would keep for months, and would be useful in a variety of forms of bowel complaint as in India, especially in chronic diarrhœa and dysentery, or in irregular action of the bowels, when it not unfrequently is said to be as beneficial in constipation as in the opposite condition. Given in the form of sherbet it is pleasant and refreshing, soothing and demulcent, from its aromatic and astringent properties, and from the viscous character of the mucilage that surrounds its numerous seeds.

It is hardly necessary to say that the bael is an orange with a ligneous rind in which there is much essential oil; that its pulp is astringent, and contains numerous seeds embedded in the tenacious mucilage. It is common in India, ripens in the autumn, and could be easily brought to England in the imperfectly mature condition. The bael has frequently been described, and is well known to medical men in India as a valuable remedy—not, as sometimes supposed, in the treatment of acute dysentery, but in certain chronic forms of that and other bowel complaints. Martin, Cleghorn, Grant, Waring, Jackson and others, have spoken of its good effects. Sir R. Martin in the *Lancet* of 1853, and Mr. A. Grant in the *Indian Annals* of 1854, call attention to it. The latter says, "It is useful in habitual constipation, taken early in the morning, and also in the irregularity of the bowels attended by periods of looseness alternating with constipation as is so often seen in certain seasons in India. It has been given with good results in mucous diarrhœa, chronic diarrhœa, and dysentery." In fact, many Indian physicians have spoken highly of bael for such purposes, and to a great extent I can confirm their opinion—at all events, quite sufficiently to say that it is a useful and pleasant remedy for some forms of bowel complaint in their chronic conditions; and to express my belief that it would be a valuable addition to our resources in the treatment of similar diseases here.

The preparations of bael are sherbet, and conserve or marmalade—both pleasant to take.

The officinal preparations are the "liq. belæ" liquid of the Pharmacopœia, and the dry fruit. The non-officinal forms are the best.

For further information on the subject I would refer to the *Indian Annals of Medical Science of* 1853, pages 223 to 234; in articles by Dr. Cleghorn and Mr. Grant, giving a full description of the fruit, its preparations, and its properties, and to a paper by the late Sir R. Martin in the *Lancet* of 1853. I think that the facility with which it could, in these days of rapid communication, be imported, may induce some one to try the experiment.

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* From the *Medical Times and Gazette*, December 22, 1877.

The Pharmaceutical Journal.

SATURDAY, JANUARY 5, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

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1877.

"*Le Roi est mort! Vive le Roi!*" The old year, one thousand eight hundred and seventy-seven, has become as a tale that is told, and the thoughts of most men will naturally have "gone to salute the rising morn." Nevertheless, it is our lot to look backward for a few moments and once more to attempt to transcribe the story of a past year of pharmacy in Great Britain. Such a task may not appear to be very ambitious, but we hope the work will prove as useful as some that aspires higher and takes a wider range.

"Little avails it now to know
Of ages passed so long ago,
Nor how they rolled;
Our theme shall be of yesterday,
Which to oblivion sweeps away
Like days of old."

Not much can be said of what may be called the political history of pharmacy in this country dissociated from the history of the Pharmaceutical Society as represented by its Council. It is no exaggeration to say that every subject of interest to British pharmacists comes under the consideration of that body, and that, although sometimes it cannot do all that is possible in the minds of its irresponsible advisers and critics, it exercises continually an extensive and beneficial influence upon the events that make pharmaceutical history. The Council has during the past year received two new members, Mr. WALTER JOHN CHURCHILL, of Birmingham, and Mr. THOMAS PRESTON GOSTLING, of Diss, elected by the Society in the place of Mr. DANIEL FRAZER, of Glasgow, and Mr. SAMUEL LLOYD STACEY, of London. This has been the only change in the executive of the Society, the President, Mr. JOHN WILLIAMS, the Vice-President, Mr. WILLIAM DAWSON SAVAGE, and the Treasurer, Mr. CORNELIUS HANBURY, having been elected to fill their respective offices for another year.

Nearly the first subject of discussion by the Council, at its January meeting, was one of the Pharmacy Acts to which it owes its existence. Being of opinion that the Act of 1868, as applied to public companies, had to some extent become a dead letter, Mr. HAMPSON proposed that a Committee should be appointed to consider and suggest amendments that appeared desirable so that the Council should be prepared to profit by any opportunity that might arise during the forthcoming session of Parliament to secure its amendment. After considerable discussion, the proposition was accepted so far that the Parliamentary and Law Committee was requested to appoint a small sub-committee to consider the provisions of the Act with a view of preparing or suggesting any alterations which it might deem expedient. The sub-committee appointed consisted of Messrs. BETTY, GREENISH, HAMPSON, HANBURY, HILLS and SANDFORD, but no legislation being proposed in Parliament that furnished the required opportunity, the report of the sub-committee did not come before the Council until November, and it is still under consideration.

Early in the year, too, the presumed laxity of the Council in carrying out the provisions of the Pharmacy Act led to a lively little interlude. The Chemists and Druggists' Trade Association, having been at the trouble and expense of collecting evidence which its executive considered to be conclusive as to breaches of the Act, an intimation of this fact was forwarded to the Secretary of the Pharmaceutical Society, together with an inquiry as to the employment of the Society's Solicitor that was as suggestive in its way, and as open to misconstruction, as the celebrated experiment of Prince HENRY with his father's crown. The Council of the Pharmaceutical Society, however, showed no disposition to abandon or to delegate the powers confided to it by Parliament, and passed a resolution that it would not instruct any solicitor to sue for penalties for alleged infringements of the Pharmacy Act until the evidence in support of each charge had been considered and found sufficient by the Council itself. On the other hand the executive of the Trade Association subsequently passed a resolution to the effect that its letters had been misunderstood, and that there had been no intention of forcing on the Pharmaceutical Council any cases, but simply of supplying such evidence as might be deemed necessary, if the Council were willing to make use of it.

Probably the misunderstanding is best explained in the light of what took place subsequently at the Annual Meeting of the Pharmaceutical Society, when Mr. CHURCHILL, of Birmingham, expressed his opinion that there existed a strong feeling that the practice of first warning unregistered persons against whom evidence of a breach of the Pharmacy Act had been procured, instead of proceeding against them at once, had acted prejudicially. The PRESIDENT explained that the Council had not thought it advisable to carry out the Act with any appearance of vindictiveness, and had therefore instructed the Secretary, when he received information of offences against the registration section of the Pharmacy Act, to write to the inculpated person, if his name was not on the Register, to know why he was carrying on the business of a chemist and druggist, and to warn him against doing so illegally. Occasionally the alleged offender so written to proved to be acting within his right, but if not, and the warning was disregarded, a prosecution was commenced. The meeting appeared satisfied with the explanation, and the subject then dropped. At the July meeting of the Council, however, it was revived on the presentation of a report from the Law and Parliamentary Committee, referring to a letter the Secretary had received from Mr. CHURCHILL, who had meanwhile become a member of the Council, in which, in respect to some alleged infringements of the Act, particulars of which had been sent up by the Trade Association, he expressed a hope that proceedings would be taken without sending the usual premonitory letter. The report referred also to a motion to the same effect which had been made in committee by Mr. CHURCHILL, and lost. The rejection of this part of the report was moved by Mr. HAMPSON and afterwards by Mr. BROWN, whilst Mr. SANDFORD moved that all reports of infringements should be brought first to the notice of the Law and Parliamentary Committee, and that it should rest with that Committee to send premonitory letters to alleged offenders or not, at its discretion. Mr. MACKAY pointed out that the Secretary only sent letters to persons who were complained of for the first time, whilst the majority of the members considered there was nothing in the special circumstances then under consideration necessitating a departure from the rule that had worked well for two years. The amendments were consequently lost, a result that evoked an expression of regret from the executive of the Trade Association.

It should be clearly understood that there are two classes of offences under the Pharmacy Act, 1868, and that the above discussion related to the class of offences against the fifteenth section of that Act, which confines the use of the titles pharmaceutical chemist, chemist and druggist, etc., and the retailing and dispensing of poisons to registered persons. In these cases the liability to pay a penalty of five pounds accrues absolutely upon the commission of the offence, and that sum is recoverable in the ordinary way as a small debt, without reduction, by the Registrar under the Act for the time being, and by him alone. It is found in a large proportion of the cases that a warning is sufficient to secure a cessation of the offence, and as this result and not the recovery of penalties is the object sought by the Council, no further proceedings are then taken. When the offence is persisted in, however, the penalty is applied for, and sometimes this is paid without further proceedings, whilst at other times the penalty has to be recovered through the intervention of a court. The other class of offences under the Act is against the seventeenth section, relating to the registration of sales and the labelling of poisons. In these cases any person is at liberty to institute the prosecution, and the amount of the penalty—a sum not exceeding five pounds for a first offence or ten pounds for a subsequent one—has to be decided by a magistrate and is dependent upon a conviction. During the past year five such convictions, in which the police have been prosecutors, have been recorded in this Journal: two for the sale of an article included in the first part of the poison schedule without entering the sale in the poison book, and three for the sale of a preparation of laudanum without a poison label. Besides these the Trade Association has been successful in obtaining three convictions for the sale of poison not labelled with the name of the actual seller, in one case the magistrates remarking that though with regard to a mercantile house trade could be carried on under an assumed name, they thought the Act of Parliament made it very clear that a person who sells a poison should put his own name on the label. In consequence of unacquaintance with the distinction above pointed out, in respect to the two classes of offences, magistrates have during the year twice imposed modified penalties that they had no right to diminish, or even to inflict, at the suit of the police who are not entitled to prosecute under the fifteenth section.

The inconsistency of fining a chemist and druggist for selling a pennyworth of narcotic cordial without a poison label, whilst the most ignorant huckster is allowed to sell an unlimited quantity providing it bears the patent medicine stamp, has been frequently commented on, and in April a communication was received by the Council from the Hull Chemists' Association urging that the sale of all articles containing a scheduled poison, although covered by a patent medicine stamp, should be strictly confined to registered chemists and druggists.

Whilst referring to the poison schedule it may here be recalled that at its November meeting the Council by virtue and in exercise of the powers conferred on it by the Pharmacy Act, resolved that chloral hydrate and its preparations should be deemed a poison within the meaning of the Pharmacy Act, 1868, and included in the second part of the schedule. The prescribed approval of the Lords of the Privy Council appeared in the *London Gazette* for December 15.

Closely associated with this subject was another that occupied the attention of the Council early in the year. The Pharmacy Acts provide that all sums of money arising from the recovery of penalties under them shall be paid as the Commissioners of Her Majesty's Treasury shall direct. As the carrying out of the Acts by the Pharmaceutical Society on behalf of the public involves an expenditure far in excess of the penalties recovered it had been assumed that they would be left in possession of the Society. Rather unexpectedly, however, an order was received from the Treasury to pay over all the penalties recovered under the Acts since they were passed. A deputation was thereupon appointed to lay before the Commissioners of the Treasury the views of the

Council upon the subject, and in February a communication was received stating that the Council was at liberty to retain these penalties.

But perhaps the subject that has occupied the largest share of the attention of the Council and of chemists and druggists generally during the year has been the prolongation of the attempt made by a certain section of the medical profession to interfere with the right to prescribe. The subject was not a new one, having been considered in the year 1876, when the Council announced that it was prepared to consider the case of any chemist and druggist threatened with vexatious proceedings, and, if the circumstances warranted, to provide for his defence. In March a suit which promises to become a notable one in the history of this dispute was instituted at Nottingham, against a chemist and druggist named SHEPPERLEY, to recover a penalty of twenty pounds, for the offence of having acted as an apothecary, he being unqualified. The case was defended by counsel instructed by the Trade Association, but notwithstanding that evidence was given as to the custom prevailing before the passing of the Apothecaries Act which might have been supposed to bring the practice in dispute within the operation of the section reserving to chemists and druggists all previously existing rights, the County Court judge gave judgment against the defendant. Upon this decision notice of appeal was immediately given. Other similar prosecutions have since been commenced in various parts of the country, but the decisions have been postponed until this appeal has been decided.

The fact that the Annual Report of the Council, issued shortly afterwards, contained no allusion to the Nottingham case, or even to the subject, evoked criticism at the Annual Meeting of the Society from some members who appeared to fear that this silence was a sign of apathy. Additional pungency was imparted to the discussion through the appearance the day before of a Bill that had been introduced into Parliament by the East London Medical Defence Association, containing a clause which would have made any person not registered under the Medical Act who practised medicine or surgery for gain liable to a penalty of twenty pounds. The PRESIDENT was able to show that the Council was alive to the gravity of the situation, it having already had the Bill under its consideration, whilst the Solicitor probably defined with tolerable exactness the course the Council had decided to take on the general question, in advising that a stand should be taken on "counter practice as a necessity of the case for chemists and druggists and the public convenience," and expressed his conviction that if there were a well conducted fight on this point, no chemist and druggist who kept within his own doors had anything to fear. This opinion as to the Council's position is confirmed by the fact that in August, when Messrs. HAMPSON and ATKINS brought forward a motion that the Council should defend, if necessary, a member of the Society who had been threatened with prosecution under the Apothecaries Act, the Council authorized its Solicitor to undertake the defence at his discretion and at the expense of the Society. This is not the place to enlarge upon the subject, but it must be evident that where such important interests are involved the fight to be "well conducted" need not necessarily be fought in defence of the first case that presents itself, nor need it even involve an appearance in the law courts at all. The marked indifference, if not disfavour, shown by the heads of the medical profession to the Bill of the East London Medical Defence Association—the Medical Council having virtually recommended its postponement to the Greek Kalends—was significant that there is no disposition on their part to push matters to extremes any more than the majority of chemists and druggists would wish to spend their money in defence of all the practices objected to. This cannot be without its influence on the counsels of the Apothecaries' Company before it risks an Act that by no means warrants the strained interpretation put upon it, and which in its verbiage does not evidently confer upon the apothecary any privilege in respect to the supplying of medicines that it does not reserve also to the chemist and druggist, except the privilege of being fined if his duties are not performed faithfully. In October, Mr. SCHACHT moved that an effort should be made by the Pharmaceutical Society to arrive at an understanding with the Apothecaries' Company as to the class of cases of alleged infringement of the Apothecaries Act that should be open to prosecution, and that a committee should be appointed to confer with the Company. Although this proposition did not meet with much support, it appears that when the subject was again under discussion at the December meeting the Solicitor was instructed to communicate with the Solicitor to the Apothecaries' Company, and since a decision obtained in a law court, whilst it involved defeat to one side, might prove to be a Pyrrhic victory to the other, it may be hoped that some action taken in the spirit of Mr. SCHACHT'S proposition may lead to a practical settlement.

Since writing the foregoing paragraph some progress appears to have been made in that direction, as will be seen on reference to the report of this week's Council meeting, and the report furnished by the Solicitor of his conference with the Solicitor of the Society of Apothecaries was understood to contain a distinct disavowal of any desire to institute vexatious proceedings against chemists in regard to giving that amount of advice to their customers which is necessarily involved in the ordinary course of their business. From this, as well as from the facts stated in connection with Dr. LUSH'S Bill, it will appear that those persons are very much in error who believe that this subject has not received the careful attention of the Council. It affords another illustration of the fact that, thanks to the influence that can be brought to bear by the Council on behalf of the pharmaceutical body, very important ends can be attained without the inconvenience and expense involved in legal contests.

The remainder of the history of this subject may be quickly told. The Bill introduced into Parliament by the Defence Association had a brief existence of less than three weeks. A deputation from the Council, consisting of the President, Messrs. SANDFORD, ATKINS, and HILLS, having been appointed to wait upon Dr. LUSH, who had charge of the Bill, that gentleman, in deference to the representations made on behalf of the Pharmaceutical Society, withdrew the Bill a few days afterwards. It is true that he introduced another which differed only in a few words, but in this form it was met with the contempt of the original promoters and the indifference of those against whom it was originally directed, and it perished with other "innocents" at the end of the session almost without a sign. The appeal against the decision in the Nottingham case, which was carried on at the expense and under the direction of the Chemists and Druggists' Trade Association, came on for hearing in the Exchequer Division of the High Court of Justice on the 20th and 22nd of November, before the Lord Chief Baron and Mr. Baron CLEASBY. Before the leading counsel, Sir HENRY JAMES, had finished his opening argument, their Lordships intimated that the materials before them,—the evidence given in the County Court,—seemed insufficient to enable them to give judgment in so important a suit, and expressed a wish that there should be a new trial of the case in that Court, Mr. Baron CLEASBY saying that if it could be shown, going back as far as living memory does, that chemists and druggists have been in the habit of dispensing across the counter, and that now and for a considerable time it has been part of the business of a chemist and druggist to do that, it would be very important. This course, after some objection on the part of the counsel for the Apothecaries' Company, was eventually agreed to, but up to the present time no further steps in the case have been made public.

Another subject that gave rise to a lively discussion at the Annual Meeting was the sale of scheduled poisons at Co-operative Stores, a motion having been made, though afterwards withdrawn, instructing the Council to take legal steps against the proprietors of one of the stores. Mr. SANDFORD stated that co-operative stores had occupied the attention of the Council a great deal, and probably the same may be assumed concerning the executive of the Trade Association, but no more definite result seems to have been attained than a more widely extended recognition of the difficulties that beset the question.

Not the least important among the public functions of the Council of the Pharmaceutical Society is that relating to examination. During the past year the usual four Preliminary examinations have been held. The number of candidates presenting themselves at the respective centres were 1083, being 29 in excess of the number in the preceding year; of these 577 passed, whilst 506, or 45·8 per cent. failed, against 42·4 per cent. of failures in 1876. Besides these, 30 certificates of other examining boards have been received in lieu of the Preliminary examination, making a total of 536 persons registered as apprentices or students during the year. At the Minor examinations 536 candidates presented themselves; of these 299 passed and 237 failed, being 44·2 per cent. of failures, against 46·3 per cent. in 1876, and 50 per cent. in 1875. Of Major candidates there were 98, with 45 failures, or 45·9 per cent., against 38·6 per cent. in 1876. The gross number of candidates presenting themselves for examination during 1877 was 1742, being 103 in excess of the number in the previous year.

It will be seen by the above figures that the percentages of failures in the three examinations are remarkably close, being 45·8, 44·2 and 45·9. From this it may be inferred that whatever may be said of the absolute standard of the whole of these examinations, the relation in which they stand to each other in respect to stringency is as near perfection as is likely to be attained. Nor is the proportion of failures, compared as a whole with the known results of other examining bodies, at all suggestive of the standard being fixed unduly high. But in the opinion of the Glasgow Chemists and Druggists' Association the questions in the Preliminary examination papers are now more difficult than formerly, and are likely to deter lads from entering the business, and so to cause a greater dearth of apprentices. This opinion was communicated to the Council at its December meeting, with a request that it would instruct the examiners, in this case the College of Preceptors, on the point, but a comparison with the statistics of former years led the Council to the conclusion that the proportion of failures has by no means increased, and the Secretary was instructed to inform the Association of this result. In view of the present apparent equality of the examinations, just pointed out, it is not quite clear what advantage there would be in dealing with the first examination in a way that would relatively intensify the difficulty of that which is to come after, or why there should be such anxiety to facilitate unduly the entrance of youths into a business that is continually described as being already overcrowded. There is also another element to be taken into consideration. It must not be forgotten that these examinations are conducted on behalf of the public, and are in its interest placed under the supervision of the Lords of the Privy Council. Although the Visitors appointed by the Privy

Council have again reported most favourably of the examinations as at present conducted, one of them stating that the examiners discharge their duties with a judicious combination of strictness, impartiality and consideration for the candidates, there is no evidence in their reports that they would look with favour upon the lowering of the standard of any of the examinations; in fact the indications are in the opposite direction.

With respect to measures for securing the education of which these examinations are designed to be the test, it would appear from the reports of the Professors that a fair average number of pupils is in attendance at the School of Pharmacy in Bloomsbury Square. Considering the many competing establishments that now exist in the metropolis and its neighbourhood, having for their professed object the supplying of the demand for pharmaceutical education that has been created by the past policy of the Society, this is perhaps as much as can be expected. There is little fear that under its present leaders the old school will hold its own, and justify its position as the model school of pharmacy. Last year again the pharmaceutical blue ribbon and the next open prize were carried off by two of its pupils; but a pupil from the north was close upon their heels, and the possibility that positions may be reversed in another year must be admitted. Naturally the sympathies of many will be with *alma mater* in the struggle, but the keener the contest the healthier will be the result, and the more completely will the educational policy of the Council be vindicated.

It cannot be said, however, that pharmaceutical education in the provinces is on the whole in a very robust condition. It has recently been alleged by Mr. Fairlie, of Glasgow, that this is to be attributed to the neglect of the Council, and he suggests the formation of a central educational board, the apportionment of the country into twelve districts, the establishment of a school of pharmacy modelled on that at Bloomsbury Square in a centre in each district, and the subsidizing of each school from the funds of the Society. There is nothing, however, in the reports from provincial societies that have been forwarded to the Journal during the past year to indicate that the predominant want is that of schools, but there is a continual complaint that where educational facilities are provided, having the advantage of local supervision, students do not make their appearance to utilize them. In some of the larger centres, where there is some demand for pharmaceutical education, such as Manchester, Birmingham and Edinburgh, the demand is fully met, and the schools become practically self-supporting, or if there be a little timely help wanted there is no real difficulty in obtaining it from the Pharmaceutical Society. Thus in 1876 a grant was readily accorded to the Manchester school, but in 1877 it was in so prosperous a condition as not to need its repetition. Two grants in aid have been made during the past year, one of fifty pounds to the Bristol Pharmaceutical Association, and one of five pounds to the Oldham Chemists' Association, and these are all that have been applied for. From a return made in June, by direction of the Council it appeared that the amount expended during the previous year on purposes connected with pharmaceutical education, including the endowment of the professorial chairs, was £718.

The result of the alteration in the regulations relating to the prizes offered by the Council for competition between the best men of the year, irrespective of the school where they may study, has been very marked. It will be remembered that these prizes consist of the "Pereira Medal" and two "Pharmaceutical Society's Medals," one in silver and one in bronze, to which presents of books have been added by Mr. Thomas Hyde Hills, and these are offered for competition amongst the successful Major candidates of the year. At the last examination there were thirteen competitors, against nine in 1876 (the first year of the new regulations), whilst in 1875 the Pereira medal was not awarded for want of a competent applicant. The prizemen of the past year were Mr. George William Bullen (Pereira Medal), Mr. Henry George Greenish (Society's Medal, silver), and Mr. William Inglis Clark (Society's Medal, bronze). Of the prizes awarded to the students in the Society's school, Mr. Bullen gained the Silver Medal in the Chemistry and Pharmacy Class, and Mr. Robert Henry Parker gained the Silver Medals in both the Botany and Materia Medica and the Practical Chemistry Class. The Herbarium Silver Medal was awarded to Mr. J. T. Creswick Williams.

The opening of the present session of the school, at which as usual the prizes awarded to the students of the previous session were distributed, was signalized by an admirable address delivered by Mr. William Southall, of Birmingham. It may be remarked, as probably it escaped the notice of most readers, that this address was in some respects a curious instance of the fact that a successful oration is frequently but the happy expression by one man of thoughts that are floating more or less indefinitely in the minds of many. In Mr. Southall's address there were some ideas almost identical with those to which Professor Tyndall gave utterance in a speech that created some stir about the same time, although the fact that Mr. Southall's address had been in type several days before that of Professor Tyndall was delivered at Birmingham precludes any possibility of closer relationship. It will not be inappropriate to note here, too, that although the attendance of ladies at such meetings is specially invited, whilst the Conversazione is entirely dependent for its success upon their presence, the Council has been again very much exercised as to whether it shall receive them in any other character than as guests, and the renewed proposition to admit them, if otherwise qualified, as Members or Associates of the Society, is to be once more referred to the Annual General Meeting for decision.

The other Evening Meetings of the Society were moderately successful both in respect to papers and auditors to listen to them; the December meeting, however, showed a promise of some improvement in the coming year, under the auspices of the new Committee to whom the management of these meetings has been entrusted. The papers read were:—"The Admixture of White Hellebore with Valerian Root," by Professor Bentley; "The Colouring Matter of the Petals of Rosa Gallica," and a "Note on *Rheum officinale* grown in England," by Mr. Harold Senier; "Note on the Action of Dilute Nitric Acid on Brucia," and "False Angostura Bark and Brucia," by Mr. W. A. Shenstone; "The Pharmacopœia Test for Sulphate of Quinine," by Dr. B. H. Paul; "Notes on the Action of Chlorine upon a Beam of Light and on the Preparation of Chlorine," and "The Colour of Podophyllum Resin," by Dr. A. Senier and Mr. A. J. G. Lowe; "Medicine Measures," by Mr. B. S. Proctor; "The Poisonous Properties of Yew Leaves," by Professor Redwood; "Remarks on Sweet Spirit of Nitre," by Mr. F. M. Rimmington; "Notes on Casual Drugs," by Mr. E. M. Holmes; "Nitrite of Ethyl," by Mr. John Williams; "Observations on Russian Turpentine Oil and on Oleum Foliorum Pini sylvestris," by Dr. Tilden; and "The Use of Russian Turpentine Oil in Pharmacy and Medicine," by Mr. A. W. Postans. In addition these, in May, Professor Redwood delivered an admirable lecture on "Spectrum Analysis," which was illustrated by means of new apparatus, purchased by the Society for the use of the Chemistry and Pharmacy class.

The Library and the Museum of the Society have both been well maintained in their efficiency under the careful supervision of the Committee and officers to whom they are entrusted. The Library has been increased by about three hundred books and pamphlets, many of them of considerable value, as will be seen by the catalogue that accompanies this number of the Journal. Particularly may be noticed the completion of the set of the *Philosophical Magazine* from the year 1751, so that the volumes of this celebrated scientific journal for a century and a quarter are now available. The circulation has amounted to about two thousand entries, about one-fifth of which have been to country members, and in respect to these the Society has paid nearly £7 for carriage, by virtue of the regulations under which the carriage, one way, of books borrowed by country members is paid. The attendance, as shown by the signatures, has been smaller during the day time, compared with the preceding year, but rather larger during the evening.

The Museum has been enriched by many specimens of Indian drugs, presented by Professor Dymock, of Bombay, in illustration of the series of notes that have appeared from time to time in this Journal. From Mr. John Eliot Howard have been received an excellent series of specimens of cinchona bark, completing the set previously in the Museum. Specimens have also been received from Professors Bonmer, Dragendorff, Fluckiger, Maisch, and others. Much time and care has been devoted during the past year to the preparation of a catalogue of the specimens, which is now all but finished, and will be probably ready for issue by the end of the present month. The numbers of students connected with the Society using the Museum has been about the average of former years, but it has been consulted by many scientific men, including some from the Continent and the United States. Many duplicates that were available for the purpose have been sent to increase the collection of the North British Branch in Edinburgh, and donations of specimens have also been made to local societies. In order to facilitate this portion of the Museum work a list of duplicates is to be published shortly.

Having thus recapitulated the principal trade and educational interests that have come more or less specially under the cognizance of the members of the Council during the year, it would be wrong to leave unmentioned their work as the almoners of the trade. The past year has been notable in the history of the Benevolent Fund. Ten years having passed since the last Festival in aid of the Fund, and the right of many firms to vote by virtue of donations then given having lapsed in consequence, it was wisely suggested by the President that another Dinner would be the most pleasant way of giving them an opportunity of renewing their interest in the Fund. The suggestion was at once adopted, an appeal was issued, and on the evening before the Annual Meeting a large company, including eminent representatives of the medical profession and of nearly every interest associated with pharmacy, dined together at the Freemasons' Tavern. After an eloquent appeal from the President, a list of subscriptions and donations was read that eventually represented the sum of £1600. In addition to this special effort, there have been received during the year subscriptions and donations to the amount of about £1200, being about £160 less than that received in the previous year. On the other hand, a larger sum was dispensed in relief. In June the Council decided that six more annuitants on the Fund should be elected in October, and the amount paid in annuities during the year reached £675. A large number of cases were also temporarily relieved at an expenditure of nearly £600.

The regulations under which the Fund is administered have undergone general revision and some important modifications have been made. In August, at the meeting of the Council, Mr. Robbins moved that some of the surplus income derived from subscriptions should be devoted to securing the admission of children of deceased members and associates to orphan institutions, a certain number to be elected by the subscribers from suitable cases nominated by the Council. The discussion was adjourned until October, when the motion was withdrawn, the general opinion being that sufficient provision was already made in the power which the Council possessed and had exercised during the year, to spend money in providing or assisting in providing for an orphan a home by purchase in one of the public orphan asylums; a slight alteration has since been made, however, in the regulations to render this more apparent. Of the other alterations the principal are the shifting of the time for the election of annuitants from October to December, so as to be coincident with the close of the financial year,—the increase of the payment of annuitants of sixty-five years of age and upwards to £35 per annum,—the crediting of a candidate for an annuity with the number of votes represented by his previous subscriptions to the Fund, or in the case of a widow those of her husband,—and the admission at the elections for annuitants of proxies from subscribers residing abroad.

The annual meeting of the North British Branch of the Society was held in April, when the Council was able to present a very favourable report showing that the present arrangements work satisfactorily. The students still prove their appreciation of the new rooms, the library has been more extensively used than ever, and the interest of the scientific meetings has been well sustained. After serving the Branch effectively as President and Vice-President for three years, Mr. William Gilmour and Mr. Alexander Kinninmont expressed a wish to retire from office, and Mr. J. B. Stephenson and Mr. Alexander Napier were elected in their stead, but the Branch is still privileged with the indefatigable services of Mr. John Mackay as Honorary Secretary. Amongst the gentlemen to whom the Branch has been indebted for papers during the past year may be mentioned the names of Dr. Stevenson Macadam, Mr. W. I. Macadam, Dr. F. W. Moinet, Dr. Andrew Wilson, Mr. H. B. Baildon, Mr. F. King, Dr. A. P. Aitken, and Dr. William Craig.

Before leaving this part of the record it is satisfactory to mention that three new local associations have been formed in the provinces,—at Crewe, Blackburn, and Coventry. In June, a meeting of assistants was held, by permission of the Council, in the Theatre, Bloomsbury Square, which resulted in the formation of what promises to be a useful Chemists' Assistants' Association for London. The School of Pharmacy Students' Association has also been pursuing a fairly successful career.

With respect to the movement to secure earlier closing, upon which the success of these and similar societies so much depends, it is to be regretted that more progress has not been made. A meeting was held in April, under the presidency of Mr. Sandford, in the Theatre, Bloomsbury Square, when it was agreed that it was desirable that the window shutters should be put up at 8 o'clock and the door closed at 8.30 on week-days, except Saturday. It was understood that local meetings would be held to secure this object, but up to the present time none have been reported.

With the exception of the short-lived Medical Acts Amendment Bill before referred to, the Parliamentary Session was singularly barren of special interest to pharmacists. It is true that another Bill to amend the Sale of Food and Drugs Act was introduced, but its *raison d'être* was not very apparent, and it disappeared. In carrying out the existing law, however, several cases occurred that are worth notice.

First must be placed the settlement of the long-vexed "milk of sulphur" question by the result of an appeal to the Knutsford Quarter Sessions, the magistrates having decided that there are two distinct substances known in the trade and the medical profession as lac sulphuris and sulphur præcipitatum, and that they are supplied to the trade and the public by these names as two distinct things. This decision was given at the beginning of April, and since that time the chemist and druggist has been free to sell, if he chose, the well known lime preparation under the name by which it has been familiar to the public for more than a century without fear of being prosecuted as a cheat, and yet no very great disaster has followed. Prosecutions for the sale of aloetic or mercurial pills under the name of "castor oil pills" have on the other hand been followed by convictions. Attention was also called in a medical contemporary early in the year to the sale of lozenges containing a considerable quantity of calomel under the name of "castor oil lozenges," and the correctness of this statement was confirmed by an examination made by Mr. A. R. Wilson. Probably prosecutions for the sale of these would have had a like result, and it must be admitted that although there are many other substances sold under names quite as little representative of their composition, no good purpose is to be served by the multiplication of such misnomers. There have also been several prosecutions for the sale of soda and potash waters that did not contain the Pharmacopœia quantity of alkali, but the absurdity of this course was too transparent, and the cases were dismissed; there has been a disposition, however, on the part of magistrates to convict in cases where the alkali was quite absent. The presence of 1 part of lead in 20,000 parts of citrate of magnesia was deemed sufficient warrant by the Procurator-Fiscal of Glasgow for charging certain of his townsmen with offences against the Sale of Food and Drugs Act, but this amount of impurity was decided to come within the exemption as to extraneous matter unavoidably mixed in the process of preparation, and the cases were dismissed. Incidentally they illustrated not only the mischief that may result from zeal without knowledge, but also an unacquaintance of a public official with decimals—he considering that the difference between 0·37 grain and 0·40 grain of lead per pound constituted the latter a much grosser offence—that speaks volumes as to obstacles that stand in the way of the more general adoption of the metric system in this country.

The sale of preserved peas containing equal to from one quarter to one half grain of copper in the pound tin, gave rise to several prosecutions under this Act in different parts of the country. As to the presence of the copper the evidence left no doubt; but with respect to the medical question as to the influence the consumption of such peas would have upon the health the evidence was very conflicting. Upon this evidence, however, the magistrates decided to convict. Considerable discussion occurred about the same time upon this subject in France also. With the object of throwing some light upon the disputed physiological point, quite apart from the morality of the object for which a copper salt might be presumed to be added to preserved peas, Messrs. Paul and Kingzett made some experiments, the results of which they reported at the meeting of the British Pharmaceutical Conference. From these they inferred that when such preserved peas are eaten, even if a part of the copper be absorbed into the system, probably the greater part passes into the fæces, and that it is likely that quite as much copper finds its way into the system through the handling of copper coins, the use of copper vessels in cooking operations, or the consumption of pickles and similar substances which are frequently prepared in copper vessels. The paper gave rise to a lively discussion at the Conference meeting, and this has been continued until a recent date, when it occasioned a development of unscientific heat that rendered its prolongation by gentlemen impossible. Other prosecutions under this Act presenting special points of interest were three for adulteration of balsam of copaiba, two of which broke down in a disgraceful manner; one for the sale of jalap with which nux vomica had become in some way mixed; one for the supply of quinine pills deficient in quinine; several for the sale of "sweet spirit of nitre" containing little or no nitrous ether, not by chemists and druggists, as alleged by a medical contemporary, but by co-operative stores and grocers; and one for exposing for sale hams coated with chromate of lead, which was held not to be an offence since the covering was not an article of food. Cream of tartar has also been met with containing barium sulphate, the source of which has hardly yet been explained. Also Professor Bentley has noticed an admixture of white hellebore with valerian root. The prosecutions with respect to beer have been rather unsuccessful. In one case the assertion that quassia was present in a sample was not satisfactorily sustained, and if it had been it was admitted that the use of quassia as a substitute for hops is now allowed by the Excise. The presence of salt in beer, which has hitherto been looked upon as an infallible sign of trickery, has been shown to be due within certain limits to natural causes, and a recent case, where it was charged that beer contained 63 grains of common salt per gallon, was dismissed on the ground that the materials legitimately used in its manufacture would yield a larger quantity, though the defendant was mulcted in £10 for expenses because he had not given notice of his intention to set up this defence!

The last annual report of the Local Government Board contained some data which, although not fully representative, as the Act is still practically ignored in some districts, are sufficiently so to throw considerable light on the question as to the amount of adulteration practised. Of 4177 samples of food submitted, presumably obtained from what were deemed suspicious sources, 515 were reported to be adulterated, and of 115 samples of drugs only 7 were reported against. It is admitted that in a considerable proportion of the cases of alleged adulteration the amount was so slight as not to warrant their being carried into court, and judging from experience if they had been many of them would have failed.

It is thus apparent that if, on the one hand, the Sale of Food and Drugs Act has diminished the practice of adulteration, it has, on the other, demonstrated that certain forms of adulteration formerly believed to be all-prevalent are practically non-existent. Twenty years ago the words placed by the Poet-Laureate in the mouth of one of his characters fairly reflected the public creed—

> "And the vitriol madness flushes up in the ruffian's head,
> Till the filthy bye-lane rings to the yell of the trampled wife,
> And chalk and alum and plaster are sold to the poor for bread,
> And the spirit of murder works in the very means of life. . . .
> While another is cheating the sick of a few last gasps, as he sits
> To pestle a poison'd poison behind his crimson lights."

It is true that this view of the case is affected by certain persons still, but to sincerely endorse such language now, in the light afforded by the operation of the Sale of Food and Drugs Act, one would need to be as madly misanthropic as Maud's lover.

Early in the year it became currently reported that certain manufacturers were using methylated spirit in the preparation of medicines capable of internal use, and Mr. Greenish stated that the Law and Parliamentary Committee had had under its notice several samples of laudanum prepared from methylated spirit. In one case the Excise authorities recovered a penalty of £25 for its use in a "patent medicine." Shortly afterwards Excise officers were directed to caution chemists and druggists against the use of cleaned spirit. There have also been convictions for selling rectified spirit and methylated spirit without a licence.

In defending several of the legal cases above referred to an active part was taken by the Chemists and Druggists' Trade Association, especially in the "milk of sulphur" appeal and the "soda water" prosecutions. The defence of the prescribing case at Nottingham has also been conducted up to the present stage by it. The annual meeting of this Association was held in London in May, and a Scotch branch has also been organized.

During the year, 41 cases of fatal poisoning have been reported in this Journal, which though not presumed to be nearly all that have occurred in Great Britain, give some clue as to the relative frequency of the fatalities from each substance and include the most interesting cases. The cases have been from arsenic, 1; atropia sulphate, 2; carbolic acid, 8; chloral hydrate, 4; corrosive sublimate, 1; cyanide of potassium, 1; an embrocation, 1; hemlock, 1; laudanum, 2; mercurial powder, 1; "nurses' drops," 1; opiate draught, 1; opium, 3; paregoric, 1; phosphorus paste, 1; prussic acid, 5; strychnia, 5; and teething powders, 2. Concerning these it may be remarked that carbolic acid was administered for medicine three times in public institutions, and mistaken once for cough mixture and once for water. The sulphate of atropia was in the form of eye water and not labelled "poison." The strychnia was in three cases taken in the form of vermin killer, but in one had become mixed with santonin, and a similar accident has led to two cases of poisoning in Canada during the year.

Although there have been several additions to the materia medica during the year just closed it cannot be said that any one of them has created an equal amount of interest to that excited more or less temporarily in previous years by trimethylamine, jaborandi, salicin and salicylic acid. In fact the latter substance, together with salicylate of soda, may be said to obtain the lion's share of attention even at the present time, and there is little doubt that they will take a permanent place in medicine, whilst the conservative properties of salicylic acid are now extensively utilized in beer brewing, the preservation of fruits, and in other directions. Some medical observers have, however, reported unfavourable results following the internal use of such substances, and more than hinted that they have a detrimental action upon the bones and teeth, the urine becoming loaded with lime salts during their use. Other unexpected results have pointed to the presence of impurities in the acid, which would in some cases have a very detrimental action; but whatever might have been the case in the early use of these substances as a medicine, there is no doubt that they can both now be easily obtained pure. Tests for their purity have been published, but there is some difficulty in detecting carbolic acid in the presence of salicylic acid. ALMEN recommends the treatment of a dilute solution with sodium hypochlorite, and sufficient ammonia to maintain the solution alkaline, which gives an intensely blue colour with carbolic acid, but not with salicylic acid. KOLBE recommends the evaporation, in a watch-glass, of a solution of one part of salicylic acid in ten parts of strong alcohol, when a crystalline ring is formed, which is white if the acid be pure, but yellowish or yellow if impure. No further suggestions have been made to overcome the inconvenience in dispensing caused by the sparing solubility of salicylic acid in water.

Another comparatively new remedy, monobromated camphor, which is practically insoluble in water, has been the subject of much pharmaceutical ingenuity. M. DAMBIER has proposed an alcoholic syrup made by dissolving 5 parts of monobromated camphor in a solution of 400 parts of sugar in 600 parts of 56 per cent. alcohol. Mr. MUNDAY proposed an elixir double this strength, substituting glycerine for sugar, using 90 per cent. alcohol, and flavouring with orange flower water. This he afterwards modified by dissolving the monobromated camphor in a mixture of spirit of cinnamon, alcoholic solution of cochineal (red elixir), and syrup. Lastly LEPAGE recommends to rub up the monobromated camphor with almond oil, which dissolves one sixth of its weight, when the product can be readily made into an emulsion. A formula for the preparation of monobromated camphor is among those recently adopted by the Paris Society. A statement by Dr. FOTHERGILL that hydrobromic acid has the property of modifying in a remarkable degree the cerebral effects that sometimes follow the administration of quinine has turned considerable attention to this compound. The observation was originally due to Dr. WADE, of Michigan, who gave a formula for what he considered to be a sufficiently pure solution of hydrobromic acid, representing ten grains of bromine to the fluid drachm. It consisted in dissolving 120 grains of potassium bromide and 153 grains of tartaric acid in a fluid ounce of water, keeping it cool until precipitation ceases, and decanting the clear liquor from the acid tartrate of potassium formed. Dr. WADE has also supplied formulæ for dispensing this hydrobromic acid solution in combination with iron, mercury, bismuth, pepsin, stramonium and ergot, all of which compounds he reports that he has used beneficially.

The great increase in the number of deaths from hydrophobia, which has so markedly affected the public mind, has naturally given rise to a host of specifics. *Xanthium spinosum*, which had been much vaunted as one, has failed to stand a crucial test upon inoculated dogs. Of those still under trial perhaps curare may be considered the most important, and Mr. Moss, who has recently collected the existing information respecting this drug, has recommended an aqueous solution of one grain in twelve minims as suitable for hypodermic injection. It is evident, however, considering the crude and probably variable nature of this substance, and its great virulence, that its pharmacy cannot be yet considered to be in a satisfactory state. Under these circumstances it might be worth notice that cyclamin, the crystalline glucoside obtained from the *Cyclamen Europæum*, L., a classic remedy against serpents' bites, has been found to have antitetanic properties, and has been recommended by Professor De Luca, of Naples, as a substitute for curare in the treatment of tetanus. It is rather curious in the face of curare being reputed as an antidote to strychnia, that hoang-nan bark, obtained from a species of *Strychnos*, and supposed to depend for any activity it may possess upon the presence of strychnia, which it contains together with brucia, is also recommended from China as a remedy against hydrophobia. False angostura bark (*Strychnos Nux-vomica*), a very similar bark, has been examined by Mr. Shenstone, who found that it also contains strychnia as well as brucia. The same gentleman has, in addition, confirmed Mr. Cownley's disproval of the conversion of brucia into strychnia announced by Sonnenschein.

A great deal of good work has been done during the year in respect to the vegetable alkaloids, but one of the principal results has been to demonstrate how much remains to be done. Of none can this be said more truly than of the aconite alkaloids. At the meeting of the Pharmaceutical Conference the third report of a committee appointed to investigate this subject was presented by Dr. Wright. It stated that *Aconitum Napellus* roots as met with in commerce contain a highly active crystallizable alkaloid, "aconitine," represented by the formula $C_{33}H_{43}NO_{12}$, and yielding crystallizable salts; a second active crystallizable alkaloid, "pseudaconitine," having the formula $C_{36}H_{49}NO_{11}$, and not readily yielding crystallizable salts; and a third apparently non-crystalline alkaloid, yielding non-crystalline salts, containing a higher percentage of carbon and apparently of little physiological activity. In the extract, and possibly existing in the root, were found decomposition products of the first two alkaloids, to which the names of aconine and pseudaconine have been given, the decomposition being represented as follows:—

$$\underset{\text{Aconitine.}}{C_{32}H_{43}NO_{12}} + H_2O = \underset{\text{Benzoic Acid.}}{C_7H_6O_2} + \underset{\text{Aconine.}}{C_{26}H_{39}NO_{11}}.$$

$$\underset{\text{Pseudaconitine}}{C_{36}H_{49}NO_{11}} + H_2O = \underset{\text{Dimethyl-protocatechuic acid.}}{C_9H_{10}O_4} + \underset{\text{Pseudaconine.}}{C_{27}H_{41}NO_8}.$$

From the ease with which this decomposition takes place by saponification, the reporters considered it probable that liquid preparations of aconite, such as the tincture, gradually lose activity if kept, and inevitably so if in a neutral or alkaline condition. The report further stated that *A. ferox* roots contain relatively much pseudaconitine, little aconitine, and another base containing a high percentage of carbon; that *A. Lycoctonum* roots contain aconitine and pseudaconitine, and that the "aconitine" of commerce is a mixture of true aconitine and pseudaconitine with variable quantities of their decomposition products and of the unnamed amorphous bases. In respect to this statement the doubtful origin of most of the aconite root coming into the market must be borne in mind. In fact Mr. Holmes has recently reported meeting with it mixed with masterwort root. At the same meeting Messrs. Paul and Kingzett gave the results they had arrived at by working upon Japanese aconite root, a clean and characteristic variety that had recently come into the market. After criticizing some statements of previous workers they stated that they had obtained from the Japanese aconite root a crystallizable alkaloid, represented by the formula $C_{29}H_{43}NO_9$, which did not give crystallizable salts, and a substance that behaved as a salt of the crystallizable alkaloid; from these facts the inference was drawn that part of the alkaloid was present in the root in combination with an acid, possibly aconitic acid. It may be mentioned here that Professor Dymock has recently described another aconite root, from an unknown species, which is used in India, under the name of "wakma," to stop vomiting and purging, to allay pain in the bowels, and as a powerful bitter and antiperiodic.

The cinchona alkaloids have again contributed their quota to pharmaceutical literature. The distribution of these alkaloids in cinchona trees has been investigated by Mr. D. Howard, who finds that there is a marked increase in the development of alkaloid in the root bark over that of the stem or branches, the tendency being to produce the dextrogyrate alkaloids, cinchonine and quinidine, in greatly increased proportions. On the other hand, the total quantity of alkaloids in the quill bark from the branches is much less than in that from the stem, but the proportion of quinine and cinchonidine is larger and that of quinidine and cinchonine is smaller. In the Ledger bark the increase of total alkaloid is slight, but the proportion of quinidine is doubled and that of cinchonine trebled, the amorphous alkaloid being also increased. In the renewed stem bark there is also an increase of alkaloid, but in this case it is of the more highly oxidized alkaloids, quinine and its isomers, whilst there is a distinct diminution of cinchonine and cinchonidine. Dr. Paul has called attention to the fact that in consequence of the increased solubility of cinchonidine in ether in the presence of quinine the quantity of ether prescribed in the official test for quinine sulphate would allow 30 per cent. of cinchonidine to pass unnoticed, and he has described a process of fractional crystallization for its detection. Dr. PAUL has also reported on an examination of some commercial specimens of citrate of quinine which showed a great deficiency of alkaloid, a result that was confirmed by the experience of Professor ATTFIELD with some other samples. Professor PRESCOTT has supplied some useful laboratory notes on the estimation of quinine. The extremely high price attained by quinine at one period of the year turned increased attention to the other alkaloids accompanying it in cinchona bark, and Mr. J. E. HOWARD brought the subject under the consideration of the Conference at Plymouth. Some conflicting experiences were mentioned, but the general opinion appeared to be that these alkaloids are not so much used as they deserve, though the matter must be left with the medical profession. In connection with this subject it may be of interest to state that Mr. HOWARD has lately received a letter from Sir LOUIS MALLET, in which the results of two years' trial of cinchonidine sulphate by the Government of Bombay are described as successful, the general medical opinion in the Presidency being that cinchonidine sulphate is a very valuable addition to the Pharmacopœia, and that it should be more generally used in civil hospitals and regiments. Finally, a compound of quinine with thymol and citric acid has been described by Signor PAVESI; formulæ for quinine hydroferrocyanide, neutral and basic quinine hydrobromides, and quinine tannate, are among the preparations recently recognized by the Paris Society; and quinine hydrochlorate has been suggested by Mr. WHITFIELD as superior to the sulphate in the preparation of tincture of quinine.

The alkaloids of *Atropa Belladonna* have been investigated by BUCHHEIM, who finds that when atropine is treated with baryta water it is decomposed into "tropine" and "tropic acid." In like manner belladonnine, an alkaloid found by HUBSCHMANN in crude atropine, is decomposed into "tropine" and "belladonnic acid." Until recently it was supposed that the calabar bean only contained one alkaloid, known as physostigmine or eserine. HARNACK has however succeeded in isolating a second alkaloid, differing from physostigmine in its insolubility in ether and easier solubility in water, and having a different and in some respects opposite physiological action. According to the same authority commercial physostigmine has frequently been a mixture of these two alkaloids, but they are now being prepared separately in Germany. Hashish, the celebrated preparation of Indian hemp, has been examined by Dr. PREOBRASCHENSKY, who states that the active principle is not a resinous matter, as was supposed, but nicotine, and that he has found this alkaloid not only in commercial hashish, but also in the flowering tops of the *Cannabis sativa* itself. Some experiments as to the alkaloidal value of colchicum root by Mr. BOWMAN seem to show that whether the root is white, black, or grey, is not of much importance, the proportion of colchicine varying but little; but that there is a considerable diminution after the root has been kept some time. An analysis by Mr. KINGZETT, of some nitrate of pilocarpine, prepared by Mr. GERRARD, has shown that the alkaloidal substance obtained by these two observers is identical, and that probably it is the only one present in jaborandi. The jaborandi leaves themselves are now little used, but the alkaloid is still in demand, and a formula for its preparation has been published by the Paris Society. An exhaustive paper on the microscopic structure of the stem of this (*Pilocarpus*) jaborandi has been made by Mr. STILES. Another "jaborandi," from *Piper reticulatum* has been examined by M. HARDY, who has obtained from it an alkaloid that differs widely from pilocarpine, and is supposed to be closely allied to curare. Dr. GREENE has described a process for obtaining the caffeine from guarana, which consists in boiling it with litharge, filtering, removing dissolved lead with sulphuretted hydrogen, and evaporating to crystallization. Timbo root, from the *Paulinia pinnata*, used as a poultice in Brazil in affections of the liver, has been examined by M. MARTIN, who has separated from it an alkaloid that he has named "timbonine." An Australian stimulant, said to have properties similar to coca, has been referred to *Duboisia Hopwoodii*, Muell., but does not appear to have been chemically examined. The hypophosphite of berberine has been prepared in yellow crystals, very soluble in water, by Mr. LLOYD, by digesting the sulphate with lead oxide at 180° F., removing excess of lead, and adding hypophosphorous acid in slight excess, a magma of crystals separating on cooling. Other vegetable alkaloids that have been described, are "sophoria," an exceedingly active paralysing poison, obtained by Professor WOOD from the seeds of *Sophora speciosa*, Benth., and "strophantine" and "ineine," obtained from the seeds of *Strophantus hispidus*, DC., used in Africa as an arrow poison. A useful table for the identification of the principal alkaloids, acids, etc., has been published by Dr. SENIER, whilst Dr. GODEFFROY has recommended silicotungstic acid as probably the most delicate test known for alkaloids.

Dr. TILDEN, to whom the old saying, "*plus aloes quam mellis habet*," might without any disrespect be suggested as a motto, has again been at work on the aloins, and described a yellow colouring matter, "aloxanthin," bearing an interesting relation to chrysophanic acid and emodin, the yellow compounds found in rhubarb root. The relation is shown in the following equations:—

Chrysophanic Acid . $C_{15}H_{10}O_4 = C_{14}H_5 \cdot CH_3(OH)_2O_2$.
Emodin . . . . . $C_{15}H_{10}O_5 = C_{14}H_4 \cdot CH_3(OH)_3O_2$.
Aloxanthin . . . . $C_{15}H_{10}O_6 = C_{14}H_3 \cdot CH_3(OH)_4O_2$.

The use of chrysophanic acid in medicine has much increased, and the common yellow wall lichen, *Physcia parietina*, has been indicated by Dr. Lindsay as capable of yielding a plentiful supply of it. Emodin has been found also in old black alder bark, and appears to be at least coincident with the condition in which this bark is most suitable for medicinal purposes, which it acquires after being kept some time. The obscurity as to the origin of the official rhubarb, which it was hoped had been dispersed by the introduction of *Rheum officinale*, still remains, the examination of a piece grown at Banbury, where the plant is cultivated by Mr. Usher, leading Mr. Holmes to the conclusion that the Russian rhubarb is produced by a plant of less rapid growth than *Rheum officinale*. In some experiments made with a sample of Banbury root by Mr. Harold Senier, he obtained, as compared with East Indian rhubarb, a brighter powder, a slightly darker infusion, and less extract.

Scammony root has been examined by Messrs. Kingzett and Farries for the doubtful alkaloid, convolvuline, but none was found; the authors report that scammony resin is a glucoside, resembling jalapin. A valuable series of papers on galbanum, ammoniacum, asafœtida, and others of the more important resins, gum resins, and balsams, has been furnished by Mr. Hirschsohn. Dikamali resin has been examined by Professor Flückiger and Dr. Stenhouse, who do not quite agree as to the composition of gardenin, its crystalline principle. Interesting information respecting hingra, kandaharee hing, and other similar bodies has been supplied by Professor Dymock. An assertion that a plant growing in the Cyrenaica district, and introduced into commerce under the name of *Silphium Cyrenaicum*, is the plant that yielded the Greek "silphion," has given rise to considerable discussion, and the plant has been identified botanically with the *Thapsia garganica*. But some experiments made by M. Yvon show that the resin from the African plant has much greater activity than that from the plant grown in Europe. Podophyllum resin has been investigated by Dr. Senier, who finds that the differences in shade of this resin depend upon physical conditions, and that they do not indicate differences of physiological activity.

Willow bark, which has acquired considerable interest in consequence of the demand for salicin, has been examined by Mr. Dott, who reports the presence of lactic acid in it. The red colouring matter of rose petals has yielded to Mr. H. Senier a body having acid properties and forming crystalline salts. Coto bark has been further investigated by Messrs. Jobst and Hesse, who have succeeded in isolating from it three more crystalline bodies, paracotoin, oxyleucotin, and leucotin. Sclerotic acid, which Professor Dragendorff considers to be the active principle of ergot, is now being used in medicine, and the detailed process for preparing it has been described; the same author has obtained from ergot three other bodies besides those referred to in his first paper published on the subject in this Journal.

The Paris Society of Pharmacy, recognizing the inconvenience arising from want of uniformity in the preparation of remedies that have lately come into use, has adopted a report containing a number of formulæ drawn up by a Commission headed by M. Petit. Some of these have already been referred to; amongst others may be mentioned those for crystallized aconitine and digitalin, narceine, apomorphine, caffeine, eserine, picrotoxin, iodoform diastase, extract of malt, pancreatin, syrups of lactophosphates and chlorhydrophosphates, thymol, preparations of jaborandi, coca, and eucalyptus, etc. Joyote (*Thevetia yccali*, DC.) is the name of a Mexican plant having powerful emetic properties, which Professor Herrera thinks should be tried in medicine; and the bark of pao-pereira (*Geissospermum læve*) is said to be used as a febrifuge and antiperiodic in Brazil.

Spirit of nitrous ether has attracted considerable attention during the year, and was the subject of two papers by Mr. Rimmington, in which he discussed the causes that have led to what he considers to be unsatisfactory results. These were followed by a very important communication from Mr. John Williams, in which he described the preparation of a solution of pure nitrite of ethyl in alcohol that should certainly receive a trial in medicine. Another compound of ethyl, the bromide, has had its anæsthetic properties described by M. Rabuteau.

Dialysed iron is the name given to a basic oxychloride of iron, which promises to become one of the most valuable ferruginous medicinal agents; its preparation by dialysis has been described in several papers. Mr. Rother has also suggested an application of dialysis in the preparation of alkaloids. A formula for dialysed iron is included in the Paris report, which also contains others for ferrous chloride and ferrous bromide. The addition of hyposulphite of soda to syrup of iodide of iron to preserve it has been recommended; but Mr. Meier raises his voice against this practice, and recommends the addition of a little free hydriodic acid. The syrup of the phosphates and Easton's syrup have furnished the topics of two more papers recently, by Mr. Laurie and Mr. Masson.

A suspicion as to the true nature of the cerium oxalate of commerce caused Mr. H. Greenish to undertake its investigation, and some specimens examined showed so large a proportion of the oxalates of lanthanum and didymium present as to render it doubtful whether the therapeutic action is to be attributed to cerium alone. The preparation of lithium carbonate and other lithium compounds from lepidolite has been described by Mr.

FILSINGER. The presence of small quantities of ammonia in subnitrate of bismuth has been noted by Mr. PIPER, who considered it to be a sign of defective manufacture, but it has since been attributed to the fact that bismuth decomposes water in the presence of nitric acid, giving rise to conditions favourable to the formation of ammonia. Several investigators have recently demonstrated conditions under which calomel is converted into mercuric chloride; the results are such as make it very desirable, considering the nature of some accidents that have been attributed to the use of calomel, that the subject should be thoroughly investigated. Paraffin oil is generally considered to be without action upon metals, but Dr. MACADAM has found that this is erroneous, and that the oil is sensibly injured for burning purposes by storing it in lead, zinc, or galvanized iron vessels.

The subject of the application of the spectroscope in pharmacy has been taken up by Mr. GILMOUR, who has contributed some interesting papers in reference to it; he has also discussed the tinctorial power of some preparations as a means of ascertaining their strength and quality. A new method of preparing extracts without heat—in fact, by separating the water by congelation—is the subject of a very suggestive paper by Professor HERRERA. Several papers have shown that glycerine of tragacanth, as a pill excipient, is growing in favour; while the whole subject of pills and pill coating has been recently dealt with in two papers by Dr. SYMES and Mr. MARSHALL. Dr. SYMES also contributed a valuable paper on the use of sugar in pharmacy to the Conference. Among the more prominent remaining points having pharmaceutical interest may be mentioned Mr. URWICK's interesting solution of phosphorus in alcohol and glycerine, with the addition of albumen; the utilization of the fixed oil of stavesacre by Mr. B. SQUIRE; the use of Russian oil of turpentine, by Mr. POSTANS; phenicated camphor; carbolate of iodine; croton oil pencils; the preparation of "pearls;" a series of recipes for perfumes by Mr. SAUNDERS, and the introduction of salicylic acid into colognes for sick rooms by Mr. LEIS. Last, but not least, comes the illustrated description of a working laboratory by Mr. SCHACHT.

It will not do to take a very wide excursion into the history of pharmacy abroad. Suffice it to say that in the United States the preparation of the next pharmacopœia is an absorbing topic; in Victoria a Pharmacy Act has been passed; and in Ceylon poison regulations based on the English Pharmacy Act have been established. Much valuable work has also been done abroad in the acclimatization of medicinal plants; for instance, in the cultivation of the jalap plant in Jamaica and the balsam of copaiba and the balsam of tolu plants in India. On the other hand, the ipecacuanha experiment in India is not very successful, and the cinchona plantations in St. Helena have been abandoned.

There have been numerous meetings having special interest to pharmacists. The British Pharmaceutical Conference met at Plymouth on the 14th and 15th of August, under the presidency of Professor REDWOOD. The British Association met in the same town on the 15th of August and following days. The meeting of the British Medical Association was held in Manchester during the preceding week. Across the Atlantic the American Pharmaceutical Association held its twenty-fifth meeting in Toronto in the first week in September. There was also a discussion on the International Pharmacopœia at the International Medical Congress held in Geneva in August. Here also reference may be made to the movement among professional chemists that has resulted in the foundation of an "Institute of Chemistry."

There are many topics that, although not pharmaceutical, are of such a nature as to justify their admittance into the columns of this Journal. Of this class there have been during the past year the lectures of Professor TYNDALL and Professor LISTER on "Germs," of Sir JOHN LUBBOCK on "Flowers in Relation to Insects;" Professor BARKER on "The Molecule and Atom;" Dr. REYNOLDS on "The Influence of Chemical Constitution on Physiological Activity;" Dr. PAVY on "The Means of Detecting Sugar in the Blood;" and Messrs. DOWNES and BLUNT's Researches on the Influence of Sunlight on Bacteria. Professor FLÜCKIGER's "Holiday in Liguria" furnished a very interesting paper, and Dr. MOREL is still contributing what it is hoped will be found to be a useful account of "The Products of the Coniferæ." In the scientific world perhaps the greatest noise has been made by the telephone; the liquefaction of oxygen which has just been announced is also a most interesting fact.

New books, and new editions of old ones, have not been wanting. Our old friend 'FOWNES' has become two handy volumes instead of one unwieldy one. The 'Medicinal Plants' of BENTLEY and TRIMEN has been continued regularly. Dr. KING, of Calcutta, has given us a valuable 'Manual of Cinchona Cultivation.' KINGZETT's 'History of the Alkali Trade' is a work *sui generis*, and likely to remain a standard one. Botanists have been favoured by Mr. BENNETT with a translation of THOMÉ's 'Text-Book.' UDOY CHUNDER DUTT has described the Materia Medica of the Hindoos. PASTEUR has applied Science to Beer Brewing. Finally there have been the Year-Books of the British Pharmaceutical Conference and the American Pharmaceutical Association, and the Jahresbericht der Pharmacie of DRAGENDORFF.

The story cannot be completed without one mournful paragraph. Pharmacy has again lost a few names that have done her honour. Abroad, CAVENTOU, the discoverer of quinine, and WEDDELL, the historian of the cinchonas, have been lost by France. Germany has lost POGGENDORFF, and Switzerland has lost AUGUST HUSEMANN, but they enjoy as legacies the 'Annalen' of the one and the 'Pflanzenstoffe' of the other. In the United States a former editor of its oldest pharmaceutical journal has passed away in Professer CARSON. In England WILLIAM GOSSAGE'S name will long be associated with the alkali manufacture. JOHN HUSKISSON before he died had acquired the name of the "father of the chemical trade." ALFRED SMEE, MARTIN MURPHY, JOHN SANGER, and FRANCIS GEORGE WARRICK were names familiar to English pharmacists. Both Mr. SHENSTONE and Mr. LAIRD had acted as Presidents of local associations, whilst the former had also rendered good service to the Pharmaceutical Society as a Local Secretary.

Enough of the story has now been told to show that last year was by no means deficient in pharmaceutical life, and also to task our readers' patience. Many topics have been left unnoticed, the periodical recapitulation in the "Month" having lightened the present task somewhat. Looking back upon the multitude of subjects of interest that have appeared during a single year in this Journal, from which the materials for the foregoing sketch are entirely drawn, we feel warranted in saying that the interests and progress of pharmacy have been fairly represented. To do this again in the coming year, which we hope will be a prosperous one to all our readers, will be our earnest endeavour.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, January 2nd, 1878.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Betty, Churchill, Cracknell, Gostling, Greenish, Hampson, Hanbury, Hills, Robbins, and Sandford.

The minutes of the previous meeting were read and confirmed.

The SECRETARY read a communication from the Privy Council approving the resolution recently passed for placing chloral hydrate in part 2 of the Schedule of Poisons, and also of the examiners appointed for the ensuing year.

DIPLOMAS TO PHARMACEUTICAL CHEMISTS.

The following being duly registered as Pharmaceutical Chemists were respectively granted a diploma stamped with the seal of the Society:—

Duncalf, James Mills Woolfenden.
Mortlock, William John.
Phillips, Evan.
Tamplin, Charles Edward.
Turner, George Thomas.

ELECTIONS.

MEMBERS.

Pharmaceutical Chemists.

Blunt, Thomas Porter ....Shewsbury.
Dear, Theophilus ....London.
Duncalf, James M. W............Manchester.
Fell, John James ....Lancaster.
Giles, William Egbert.............Birmingham.
Gorrie, Daniel ....Edinburgh.
Mortlock, William John ....Huntingdon.
Peirson, Henry ....Hertford.
Robinson, William Prior..........London.
Savory, Arthur Ledsam ....London.
Tamplin, Charles Edward.........Kingston on Thames.

Chemists and Druggists.

Crawshaw, Edward ....London.
George, Charles Albert............Sheffield.
Gibson, John Pattison ....Hexham.
Lewis, Richard ....London.
Read, Thomas ....New Clee.

ASSOCIATES IN BUSINESS.

The following having passed their respective examinations, being in business on their own account and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Izod, James Hickman ....Upper Norwood.
Prebble, John George ....Norwood.
Simpson, Allwood..................Stalybridge.
Taplin, Joseph Whelan ....Paddington.
Tice, Richard.........................Norwich.
Troughton, Henry..................Lancaster.
Weatherley, Richard John......Devonport.

Modified.

Key, Hobson........................Monmouth.
Stickler, Francis Miles............South Norwood.
Strachan, James ....Orange, N.S. Wales.
Thornley, Charles ....Carshalton.

ASSOCIATES.

The following having passed their respective examinations and tendered their subscriptions for the current year were elected "Associates" of the Society:—

Minor.

Bascombe, William ....Nottingham.
Billington, Arthur ....London.
Carlton, Arthur.....................Horncastle.
Collinson Frederick William ...Alnwick.
Cowap, John William ....Stockport.
Delamar, Edward Thomas ......Edinburgh.
Fisher, John Hutchison ....Edinburgh.
Fraser, Jonathan Innes ....Elgin.
Hutton, Harry ....Warwick.
Jenkins, Henry ....Salisbury.
Longbotham, Alonzo ....Ripon.
Mansergh, William ....Burton in Lonsdale.
Payne, Henry ....Bristol.
Peet, Henry ....Gosberton Hall.
Saunders, William Josiah ......Cardiff.
Smith, Joseph ....Sneinton.
Sugden, Samuel ....Newchurch.
Will, William Watson ....Montrose.
Wilson, James ....Buckie.

Modified.

McLean, Andrew Leith Hay A..Aberdeen.
Mills, William Drew ....London.
Milne, George ....Arbroath.

APPRENTICES OR STUDENTS.

The following having passed the Prelimenary examination were elected "Apprentices or Students" of the Society:—

Baker, Henry William Burgess.Haddenham.
Beeby, Robert Berry ....Coventry.
Bennett, Frank William.........London.
Brown, Alexander ....Dumbarton.
Burnett, Joseph Fearon.........Hyde.
Coley, William Henry............Wednesbury.
Cooper, Henry Scarborough ...Grantham.
Fox, Alfred ....Hull.
Gaylard, James Ratcliff ....Uxbridge.
Godfrey, Henry ....Godalming.
Haythornthwaite, William......Giggleswick.
Hill, Albert Clarence ....London.

Holden, John..........................Burnley.
Humphrey, John Thurlbeck ...Sunderland.
Ison, Harry John..................Wellington.
John, Dan ....St. Clears.
Lamplough, Frederick William Gt. Driffield.
Last, Alfred ....Rochford.
Lockyer, Joseph Ernest ....Deptford.
Mason, Frederic Silvester ......Leicester.
Moon, George William ....Malton.
Moore, Frank ....Mirfield.
Nobbs, Arthur Perkins ....Newport. I. W.
Palmer, Frederick Henry ......Lynn.
Pinder, Robert ....Bourne.
Preston, Henry.......................Mansfield.
Provis, Charles ....Emsworth.
Salmon, Ernest Frederick ......London.
Scott, Joseph..........................Dumfries.
Smith, Joseph ....York.
Spoor, William Joseph............Milford Haven.
Taylor, James Bennett............Bedford.
Taylor, John Cleasby ....Kendal.
Thompson, John Hartley.........Sheffield.
Waters, William Allen ....Emsworth.
Webb, George Frederick.........London.
Willet, John Algernon............London,
Willis, William......................Enstone.
Williams, Stephen..................Cardigan.
Wood, John ....Leighton Buzzard.
Yeatman, Frederick James......London.
Young, Thomas......................Cheddar.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

The names of the following persons were restored to the Register of Chemists and Druggists:—

John Chirm, 23, Guildford Terrace, Guildford Street, Birmingham.

Henry Rutler Baker, 3 Spital Street, Guildford.

Reports of Committees.

FINANCE.

The report of this Committee was received and adopted, and sundry accounts were ordered to be paid.

The Secretary drew attention to the large amount of the legal expenses incurred in prosecuting two cases of personation at the Society's examinations. He thought it was a great hardship that the funds of the Society should be called upon to bear expenses really incurred for the benefit of the public, and that it showed the great need of a public prosecutor.

BENEVOLENT FUND.

The report of this Committee was read and adopted.

Mr. Owen said that he found there was no chance of securing the election to St. Anne's School of the orphan, for which a sum of money had been placed in his hands, and he had therefore returned the money to the Society, but the friends of the child had used every effort, and spent a great deal of money, and were determined to carry the election next time.

The President said the grant having been already made, the money would of course be available at the next election.

The Secretary reported that in another case the amount granted had secured the admission of an orphan, at the late election, to the above school.

An Impostor.

The Secretary drew the attention of the Council to the fact that a woman was going about soliciting charity from members of the Society, professing to be the wife of a chemist and druggist, formerly in business in Plymouth. Inquiry showed, however, that her story was utterly unfounded.

Mr. Robbins said the case had been mentioned to him by a member of the trade, who thought it was one well deserving relief from the Benevolent Fund.

The President said the person referred to had called on him, professing to be recommended by a chemist in Sloane Street, and by other persons, and telling a very painful story. He gave her a little relief, and referred her to the Secretary, in order that she might make a regular application to the Benevolent Fund Committee. He found, however, that she had not done so.

The Secretary read a letter he had received from the Local Secretary at Bridlington Quay, thanking him for a donation of £2 from his Casual Relief Fund, which he had sent for the benefit of an old man eighty years of age, formerly in business, who was now in very reduced circumstances, but who never having been on the Register nor ever connected with the Society could not have a grant from the Benevolent Fund.

The President suggested that it would be very well if the Council voted a small sum to be placed in the hands of the Secretary to meet cases of emergency, or cases which were not within the conditions imposed by the Benevolent Fund regulations.

After some conversation, the Vice-President said he would give notice of a motion to this effect for next month.

LOCAL SECRETARIES.

Mr. William Bains Cordley, Colchester, and Mr. George Elliott, Walsall, were appointed Local Secretaries of the Society.

LIBRARY, MUSEUM AND LABORATORY.

The report of this Committee included the monthly report from the Librarian, showing an average attendance in the library of 21 in the day; 10 in the evening. Books circulated: in town, 161; country, to 20 places, 36. Carriage paid, 9s. The following donations to the library had been received:—

'Elements of Pharmacy,' and
'Manual of Vegetable Materia Medica.' 2nd edition. From Mr. G. S. V. Wills.
'The Microscope in Medicine.' From Dr. L. S. Beale.
'Proceedings of the Medical Society of London.' Vol. 3. From the Society.
'Select Practical Notes and Formulæ.' From Mr. W. Canning.
'Free Phosphorus in Medicine.' By J. A. Thompson. From Mr. A. W. Postans.
'Medico-Chirurgical Transactions.' Vol. 60. From the Royal Medical and Chirurgical Society.
'The Chemists and Druggists' Diary.'
'Calendar of University College, 1877–8.' From the College.
'Smithsonian Report, 1876.' From the Smithsonian Institution.
'Experimental Researches in Pure, Applied, and Physical Chemistry.' From Professor Frankland.

The special loan of a volume of reference marked with an asterisk was reported, and the Committee recommended that an asterisk be placed against the following books:—

'Thesaurus Literaturæ Botanicæ.' (Pritzel.)
'Catalogue of Scientific Papers.' (Royal Society.)

The purchase of the following books was recommended:—

General Fund.

'Library Journal.' Vol. 1, to complete set.
Hager's 'Pharmacopœia Homœopathica.'
Stocken's 'Dental Materia Medica and Pharmacopœia.'
Oliver's 'Flora of Tropical Africa.' Vol. 3.
'Supplement to Ure's Dictionary of Arts.'
Watson's 'Compendium of Cybele Britannica.'
Beasley's 'Pocket Formulary.' 10th edition.

Hanbury Fund.

'Baker's 'Flora of Mauritius.'

The Committee also recommended that the *Pharma-*

ceutical Journal be sent to the Medical Society of King's County, U. S., in exchange for its Proceedings.

The Curator had reported that the average attendance in the Museum during the preceding month had been, in the day, 12; evening, 4. The following donations had been received :—

Specimen of *Boswellia barteru*, one of the species yielding *olibanum*, grown at Aden. From Mr. J. Collins.

Specimen of Wax obtained from Lac. From Mr. E. Fielding.

Recent Specimen of Araroba. Dr. Symes.

The Curator also reported that the Index of the Museum Catalogue had been revised, and was in the hands of the printer. Also that the Secretary of the Leicester Chemists' Association had forwarded a list of labels required, which he would send immediately, with the specimens recently authorized to be sent.

The Professors had reported very favourably of their respective classes.

Mr. Churchill said he believed many country members were not aware that they could have books from the library on paying the carriage one way. He suggested that it should be occasionally brought under their notice on the front page of the Journal.

Mr. Greenish said the matter had been brought under the notice of members many times.

The Vice-President said there could be no objection to another notice being inserted. It was a very important privilege to country members, and the more it was made use of the better.

The report and recommendations of the Committee were received and adopted.

Coventry and Warwickshire Association.

A letter was read from the Secretary of this newly formed Pharmaceutical Association, asking that it might be supplied with a copy of the Journal as it appeared, as also the Calendar and Register of the Society.

A resolution was passed authorizing this to be done.

The President read a letter from Mr. Haselden thanking the Council for the resolution of sympathy passed at the last meeting.

House.

The report of this Committee was received and adopted.

Counter Practice.

The Solicitor attended to confer with the Council on the question of "counter practice," he having been in communication with the Solicitor of the Society of Apothecaries on that subject, agreeably to instructions given him in December.

The Council resolved itself into Committee for the purpose of receiving his report, which was understood to contain an assurance that the Society of Apothecaries had never instituted, and had no desire to institute, vexatious proceedings against chemists in the ordinary exercise of their business which necessarily involves a certain amount of advice to their customers.

Law and Parliamentary.

The report of this Committee included the usual report from the Solicitor as to the conduct of cases which had been placed in his hands.

A letter had been received from the surgeon who had signed the declaration in favour of Henry Povall, 62, High Park Street, Liverpool, desiring to withdraw his signature. In the case of David Brown von Cavania, 4, Upper Fountain Street, Leeds, the magistrate who had signed the declaration enabling him to be placed upon the Register had since stated that he knew nothing of him, and that his signature must have been improperly obtained. The Committee therefore recommended that Mr. Povall's and Mr. Cavania's names be removed from the Register.

A letter had been received referring to the sale, by an unregistered person, of homœopathic preparations of scheduled poisons. The Secretary had written to the informant asking him if he could procure evidence of the sale, by the person referred to, of any substance which could be proved to be a poison within the meaning of the Act.

Chloral Hydrate and its Preparations.

The Committee recommended that a copy of the tabulated list of poisons, with the addition of chloral hydrate and its preparations, be sent to each chemist and druggist on the Register, with a footnote drawing special attention to the recent addition.

The report and recommendations were received and adopted, and the names of—

Henry Povall, 62, High Park Street, Liverpool, and

David Brown von Cavania, 4, Upper Fountain Street, Leeds,

were ordered to be removed from the Register.

Report of Examinations.

December, 1877.

ENGLAND AND WALES.

	Candidates. Examined.		Passed.		Failed.	
Major, 12th	7		4		3	
„ 13th	7	14	1	5	6	9
Minor, 12th	18		12		6	
„ 13th	20		9		11	
„ 19th	25		10		15	
„ 20th	26	89	11	42	15	47
Modified		3		1		2
		106		48		58

SCOTLAND.

	Examined.		Passed.		Failed.	
Minor, 19th	12		9		3	
„ 20th	9	21	7	16	2	5
Modified		1		1		0
		22		17		5

PRELIMINARY EXAMINATION.

Seven certificates were received in lieu of examination :—

1 Law Society.
1 Royal College of Surgeons.
4 University of Cambridge.
1 University of Durham.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, Dec. 20, Dr. Gladstone, F.R.S., President, in the chair. After the visitors had been announced, the minutes confirmed, and a list of presents to the library read, the following certificates were read for the first time :—G. S. Taylor, G H. Spring, J. V. Elsden, and A. H. Hooker.

The first paper was "*On the Bromo-derivatives of Camphor*," by Dr. Armstrong and Mr. Matthews. In preparing monobromcamphor, the authors find that it is merely necessary to add the requisite amount of bromine to the camphor heated in a water-bath, care being taken to add only a small quantity of bromine at first; heat is then applied to effect the decomposition of the resulting dibromide: on further addition of bromine the decomposition proceeds in a perfectly regular manner. The product is purified by washing with an alkali and recrystallization from alcohol. By the action of agents which convert camphor into cymene, bromocamphor is, apparently, completely decomposed. It is readily oxidized by nitric acid sp. gr. 1·3, furnishing much camphoric acid and a magnificently crystalline body at present under investigation. The authors find that if bromine be added to camphor (2 molecules of the former to 1 of the latter), and the mixture heated for a short time in the water-bath, dibromcamphor is obtained, melting at 57°–58° in colourless glistening prisms. This substance is dissolved and decomposed by nitric acid sp. gr. 1·4, furnishing a neutral substance with properties far less characteristic than the product from monobromcamphor, but no camphoric acid.

The next communication was "*On the action of Iodine on Camphor*," by Dr. ARMSTRONG and Mr. EASKELL. The authors have investigated the so-called camphin of Claus, which they obtained in quantity as a bye-product in preparing carvacrol from camphor by Fleischer and Kekulé's method. After extracting the carvacrol with sodic hydrate, a current of steam was passed through the residue: the distillate freed from camphor by extraction with dilute sulphuric acid (5 acid 2 water) was re-distilled in presence of sodium. In fractionating the product the authors found a slightly modified form of Le Bel and Henninger's fractional distillation apparatus of the greatest use (it can be obtained from Messrs. Cetti). Almost the whole passed over between 115° and 215°. The quantity below 160° was small. The quantity between 160° and 168° was very considerable. On examination it was found to consist, in all probability, of the hydrocarbon $C_{10}H_{20}$, but resembles in some respects the paraffin $C_{10}H_{22}$. The next considerable fraction boiled at 174–176°: it consisted chiefly of cymene. The higher portions, which in the aggregate constitute a by no means unimportant proportion of the entire product, contained much laurene (of Fittig, Köbrich, and Jilke), and one, if not two, hydrocarbons. The authors are continuing these investigations, and Dr. Armstrong stated that he had made much progress in the examination of the mixtures of hydrocarbons obtained from camphor by the action of the so-called dehydrating agents, for in no case, apparently, is cymene the only product. He proposes also to repeat Weyl's experiments on the action of hydriodic acid on camphor, and to prepare hydrides from cymene.

The third paper was read by Dr. ARMSTRONG, "*On the constitution of Terpenes and of Camphor.*" In the author's opinion, the generally received hypothesis that the terpenes are dihydrides of cymene is quite irreconcilable with their properties. They do not yield acids related to the hydrocarbons of the benzene series in any quantity on oxidation, neither do they furnish characteristic nitration products; moreover, they combine with bromine with great facility, they unite with the haloid acids at ordinary temperatures and combine with water, forming compounds such as terpin $C_{10}H_{18}(OH)_2$. A dihydride of cymene might be expected on oxidation to lose the "added" hydrogen, or to have its side chains affected; but the formation of compounds whose constitution is probably (Mielak and Williams) diaterebic and terebic acids is quite without analogy. The readiness with which the terpenes undergo isomeric change and are polymerized is also at variance with the above hypothesis. The evidence as to the real constitution of the terpenes is at present extremely unsatisfactory and insufficient, their conversion into cymene and behaviour on oxidation, the two most important elements for discussion, involving apparently opposite conclusions. The facility with which they form additive compounds tends, however, to support the conclusions derived from their behaviour on oxidation, *i.e.*, that they do not contain a closed chain of six carbon atoms, and, if this be the case, cymene is doubtless the end product of a series of changes. Whether the carbon atoms are all united in an open chain, or partially in a closed chain of perhaps fewer than six, seems quite uncertain. The evidence as to the constitution of camphor is equally incomplete. It is by no means established that camphor and the terpenes are so closely related as has been supposed. There is little doubt that it does not belong to the alcohols or aldehydes, but probably contains oxygen in the form in which it exists in ethylene oxide or in the ketones. From the fact that *homologous hydrocarbons* are formed with cymene by the action of the so-called dehydrating agents and other considerations, the author concludes that camphor does not contain a cymene nucleus in which the propyl and methyl groups are relatively in the "para" position. No formula hitherto proposed explains satisfactorily the ready formation of an anhydride from camphoric acid. In conclusion, the author states that the evidence as to the constitution of terpenes and of camphor is very conflicting, but that, from their entire behaviour, these bodies appear to be compounds of an altogether peculiar constitution.

The President remarked that as Dr. Tilden had a paper on a similar subject, he would ask him to read it before any discussion took place on the papers which had just been read.

Dr. Tilden accordingly read his paper "On the Hydrocarbons obtained from *Pinus sylvestris*, with remarks on the constitution of the Terpenes." 1. *Russian Turpentine Oil*; obtained as a by-product during the distillation of wood, chiefly from *P. sylvestris* and *P. Ledebourii*, for the purpose of preparing tar. Sp. gr. ·8682. 100 mm. rotated 17° to the right. It had a yellowish colour and pleasant odour. After removing small quantities of acetic acid and creasote it was distilled, four principal ingredients being ultimately obtained. Ten to 15 per cent. of a terpene boiling at the same temperature as australene 156° and identical with it chemically; 100 mm., however, rotate +23·3°. About 66 per cent. of a terpene boiling at 171° having a characteristic odour, rotation +17°, sp. gr. 0·86529 at 15°. The remaining ingredients consisted of about 7·5 per cent. of cymene and a terpene boiling at 173-175°. No solid hydrochloride could be obtained from this terpene nor any crystalline nitrochloride. In addition to the above ingredients the oil contains small quantities of viscid hydrocarbons having high boiling points. 2. *Oleum Foliorum Pini Sylvestris* obtained by distilling the leaves of the Scotch fir with water: sp. gr. ·8756, rotation = + 5° 30′. Careful fractionation yielded two terpenes corresponding in boiling point with those above described, the first boiling at 156-159°, rotation +18° 48′, and in odour resembling common turpentine; the second, constituting two-thirds of the oil, boiling at 171°, rotation = —4°, sp. gr. ·86529: no solid hydrochloride could be prepared. In addition, a little cymene and some pleasant smelling liquids of higher boiling point were obtained. The author then proceeded to discuss the constitution of the terpenes, and pointed out that there are probably only three isomerides amongst the natural terpenes, the differences in odour, action on polarized light, etc., can be accounted for without assuming any but mechanical differences of constitution. Thus we have terpenes from American and Russian turpentine, and that from the oil of the leaf of *Pinus sylvestris*, all boiling at 156-159°, sp. gr. ·860, and dextrorotatory; the terpenes from French turpentine, oil of sage, and oil of juniper have the same boiling point but are lævorotatory. The above form the first group and all yield the same nitroso-derivatives; terebene probably belongs to the same group. The members of the second group boil at 174°, sp. gr. ·85, and yield the same nitroso-substitution compounds; they are obtained from the oils of bergamot, sweet orange peel, lemon and caraway, and are all dextrorotatory. The third class comprises the two terpenes of higher boiling point (171-173°) described above, as obtained from Russian turpentine (probably Atterberg's sylvestrene) and oil of *P. sylvestris*, sp. gr. ·865, yield no crystalline monohydrochloride or nitroso-chloride. All terpenes yield by the action of bromine α cymene, *i.e.*, methyl-propyl-benzene; by oxidation they furnish carbonic and acetic acids. Cymene will not combine with hydrogen to produce a terpene; terebene has been obtained from diamylene by removing 4 atoms of hydrogen. From a consideration of the above facts the author suggests the formula—

$$\begin{array}{ccccccccccccc} & & C_3H_7 & & H & & H & & CH_3 & & H & & H \\ & & | & & | & & | & & | & & | & & | \\ H & — & C & = & C & — & C & = & C & — & C & = & C & — & H \end{array}$$

for α terpene. Similarly by shifting C_3H_7 and CH_3 one atom of carbon to the right the formula of β terpene, whilst by shifting the propyl and methyl groups two atoms in the carbon chain, that of γ terpene is obtained. These three formulæ furnish a cymene identical in each case. As regards camphor, the author is disposed to consider it as a benzene or cymene derivative, notwithstanding the fact that he has represented the terpenes as consisting of an open chain of carbon, the reasons for which constitution conclude his paper.

The President thought that it would be convenient to discuss the new facts brought forward by Dr. Tilden before proceeding to any arguments as to the theoretical views propounded; he was interested to know if the mechanical differences existing in the structure of the various members of the terpenes involved any difference of odour or whether the odour was due to oxidized substances.

Dr. Wright had some hesitation in accepting only three modifications of the terpenes. Thus the oils of orange peel and lemon were classed together; yet whilst the former yielded 80-90 per cent. of cymene, the latter furnished only 15 to 20 per cent. Moreover their boiling points were 2°-3° apart, and admitting there were at least four terpenes it was difficult to see how the proposed formula could form the same cymene by a simple reaction.

Mr. Kingzett agreed generally with Dr. Tilden, but pointed out that all terpenes by aerial oxidation formed peroxide of hydrogen and that cymene similarly yielded peroxide of hydrogen. On the whole he was inclined to believe that terpenes were dihydrides of cymene. He had found on oxidizing large quantities of oil of turpentine that the American oil oxidized slowly, the Russian oxidized four times as quickly, whilst the Sweedish was still swifter; the French oxidized at about the same rate as the Russian. The purer the oil the less readily did it oxidize. Camphor he regarded as resembling the alcohols in its constitution. The constitution as expressed by structural formulæ represents the way in which a body splits up when subjected to a certain mode of decomposition and as the products differ according to the mode, the derived formulæ cannot represent true constitution.

Dr. Tilden in reply to Dr. Wright thought that the difference in the yield of cymene from the oils of lemon and orange was due rather to a difference in mechanical than in chemical constitution.

Dr. Witt pointed out that one benzophenol was converted into its isomer with great evolution of heat, so that here there was an instance of two isomers having a different physical constitution.

Dr. Armstrong objected to dividing the terpenes into three classes, because there were the camphenes, which must constitute a fourth class. The formula of diamylene, on which Dr. Tilden founded his formula of terpene, was not by any means established. That Dr. Tilden's formula only accounted for three classes of terpenes he regarded as but a slight objection; there was no doubt that our present formulæ were insufficient.

The President said that such discussions were valuable not only for adding to our knowledge, but for revealing our ignorance; it would be necessary, as science advances, to revise our theories. Our present formulæ simply represented our present state of knowledge, and we must not expect them to survive, but to change for something more true and more perfect. Another point raised was, how far we are to distinguish between the chemical and the mechanical structure of a body. After some remarks as to the value and interest of the physical properties of a body, Dr. Gladstone concluded by stating that if cymene was contained in these terpenes, he should have expected their dispersion to have been higher.

The next paper was "*On Citric Acid as a constituent of imperfectly ripe Mulberry Juice*," by Dr. Wright and Mr. Patterson.—A large quantity of unripe mulberries was expressed, furnishing a turbid, light brown liquid, having a very acid taste. This was subjected to analysis, and found to contain 70·16 grams of total solids per litre. The solid matter consisted of citric acid, 26·83 grams, malic acid, 7·82 grams, glucose, 2·74 grams, ash, 9·4 grams. Mucilage portion, etc., 23·37 grams per litre. The presence of citric acid was confirmed by the preparation and analysis of the lime salt. In conclusion, the authors pointed out that the juice of imperfectly ripe mulberries, as it contains such a quantity of citric acid, and 3·26 grams per litre of potash salts (calculated as carbonate), may be valuable as an antiscorbutic and as a substitute for lime juice.

The next communication was made by Mr. Thomas "*On Cuprous Chloride and the absorption of Carbonic Oxide and Hydrochloric Acid Gas.*" The author, after many trials, found the following method for the preparation of the solution of cuprous chloride to give the best results. A long, narrow, 4 oz. stoppered bottle is filled three parts full with copper turnings, 6 grams of ordinary hydrous cupric chloride, and 20 c.c. of strong hydrochloric are introduced, and the bottle shaken until the $CuCl_2$ is dissolved; 10 c.c. of water are run in so as to float on the acid liquid, the bottle is then violently shaken; the solution becomes colourless instantly and after the addition of 30 c.c. of water is ready for use. The author finds that such a solution absorbs carbonic oxide with facility, but that when the free hydrochloric acid is suddenly neutralized with potassic hydrate as much as 63 per cent. of the carbonic oxide is again liberated and will remain unabsorbed. If the neutralization be effected slowly, about 4 per cent. only will be set free. To avoid any error from this reaction the author neutralizes the hydrochloric acid with ammonia before introducing the cuprous chloride solution. He prepares his solution thus: Some of the above cuprous chloride solution is poured into a small porcelain crucible, and to it is added by means of a fine pipette ammonia (1 of ·880 to 1 of water) until the slightest shade of blue remains permanent. This solution is introduced at once into the absorption tube by this method. Neither free ammonia nor free acid is introduced whilst the reagent absorbs carbonic oxide nearly as well as the original acid solution. The absorption is complete in half an hour. It is stated (Sutton's 'Volumetric Analysis,' p. 367) that sodic phosphate and sodic sulphate owe their absorbent powers, for hydrochloric acid gas, to their water of crystallization. The author has found that this is not the case, but that these substances form with HCl acid salts and sodic chloride. Ammonic sulphate in saturated solution is, however, the most convenient reagent, and by adding an equal volume of such a solution to the above cuprous chloride solution, the hydrochloric acid is neutralized without the liberation of any carbonic oxide. Or the solutions can be mixed before introducing them into the obsorption tube, as the mixture absorbs carbonic oxide with facility.

After the thanks of the meeting had been given to the authors for their respective communications, the Society adjourned to Jan. 17th, when the following papers will be read—

On the action of reducing agents on Potassium Permanganate, by F. Jones.

On the Alkaloids of the Aconite family. Part II. *Alkaloids of Aconitum Ferox*, by Dr. Wright and Mr. Luff.

On the Action of Sulphuric Acid on Copper, by Spencer Pickering.

Communications, Letters, etc., have been received from Mr. Hanley, Mr. Harrison, Mr. Holgate, Dr. Morel, Messrs. Kilner, Mr. Davies, Mr. Sainsbury, Mr. Haffenden, Mr. Willmott, Mr. Langbeck, Mr. Prebble, W. G. W., C. E. S., Syrupus, Apprentice.

We are compelled to postpone the answers to several communications.

THE ARTICULATING TELEPHONE.

The articulating telephone of Professor A. Graham Bell has attracted an amount of popular interest such as few, if indeed any, of our most remarkable modern inventions have approached. The handiness of the instrument and the conditions of simplicity and perfectness under which it has been introduced into this country have conduced largely to these favourable opinions and results.

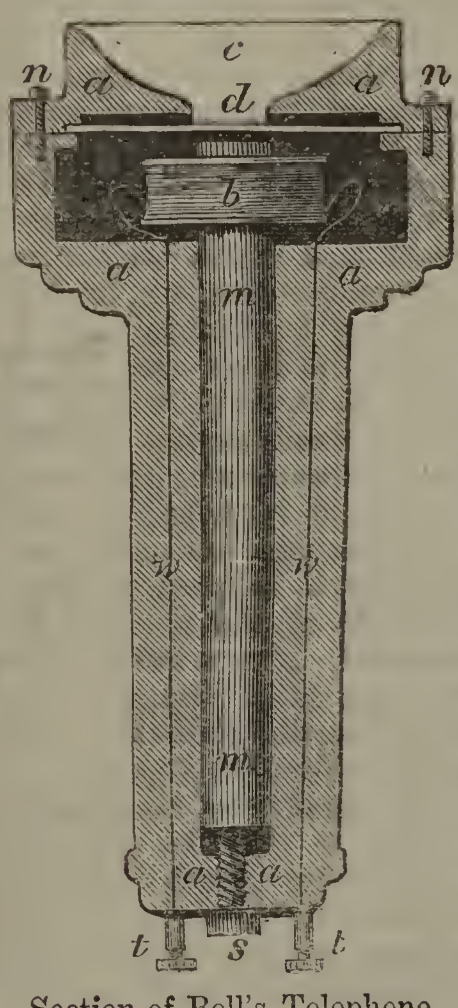
Sound is produced by vibrations of the air, and musical notes depend upon the respective particular numbers of vibrations per second of time. Vibrations of the air are produced if electric currents are passed through an electro-magnet, and the contact of its armature made and broken. If, therefore, this be done more than sixteen times per second, distinct tones are produced by the vibrations. This is the fundamental principle of the electrical telephones. The notes or sounds they emit are not transmitted in the sense that the vibrations of musical notes were actually and mechanically transmitted in the early experiments, in which, by connecting the sounding-boards of two pianos by a wooden rod, the strings of the one were caused to respond to the playing of the other; but the sounds received by hearers are reproductions, by means of electrical currents of peculiar qualities, of the sounds spoken by the converser.

The discovery of this "galvanic music," formed by the rapid magnetization and demagnetization of iron bars, is attributed to an American physicist, Page, in 1837; and the first telephone which produced rudimentary musical sounds at a distance is said to have been made by Reiss, of Friedrichsdorff, in 1861.

The tone of a musical note is dependent on the number of vibrations in time only; the intensity of the sound depends on the amplitude or extent of the vibrations; and the *timbre*, or quality, on the peculiarity of the motions of the moving particles of air in the waves produced in the atmosphere. The vibrations producing musical notes can be communicated to an electric current and reproduced at any distance by the rapid charging and discharging of an electrical condenser by simple intermittent or pulsatory currents, as was done by Cromwell Varley in 1870, and still more perfectly and publicly last year at the Promenade Concerts at the Queen's Theatre in London. It is the speciality of Professor Bell's telephone that the *timbre* or quality of the sound is reproduced; and thus it has been rendered practicable to carry on conversation by actual words between any two points in electrical communication however distant those points may be apart.

The instrument which Professor Bell has produced is very compact, being enclosed in a wooden case not much bigger than an ordinary single opera glass. For the transmission of words the broad end is spoken into: and for the comprehension of speech produced the broad end must similarly be held to the ear. For conversational purposes two instruments are needful, otherwise both parties may be trying to talk, or be listening together, at the same time and some confusion of purpose arise.

It is not essential, in a concise notice like the present, to trace in detail the various stages of the development of the invention; but it is notable that two lives have been concerned in the ultimate results. The inventor's father, Mr. A. Melville Bell, of Edinburgh, was, many years ago, well known for the attention he gave to the mechanism of speech, and the son in this way has, from his earliest years, been an associate in numerous experiments and researches on the musical relations of vocal sounds—indeed, the immediate origin of the articulating telephone appears to have been laid in a continuation of such researches. Every vowel has its particular pitch; and Professor Bell, whilst resident in Canada, carried on a series of experiments with tuning-forks held in front of the mouth, the results of which he communicated to our countryman, Mr. A. J. Ellis, from whom he learnt that he was only following in the footsteps of Helmholtz, who had already advanced to the extent of reproducing vowel sounds artificially by electrical means. From that period Professor Bell devoted his attention to the study of electricity as a means of advancing telephony, under the idea of the great practical utility of transmitting by musical sounds several telegraphic messages simultaneously. By an arrangement of tuning forks with resonators to reinforce the sound Helmholtz had found that, by varying the loudness of the forks by the influence of resonators so as to combine musical tones in different proportions, he was enabled to copy the *timbre* of certain vowel sounds. In this composite character of articulate sounds was a clue of primary importance. A harp was made of steel rods, attached to a powerful permanent magnet, which vibrated in the presence of an electro-magnet; and a similar arrangement was repeated at the other end of the electrical circuit. By the vibrations of a permanent magnet in the neighbourhood of an electro-magnet, a current of electricity is produced, the intensity of which is proportional to the velocity of the motion of the magnet, and its polarity is dependent on the direction of the motion. If then a vowel sound can be produced by vibrating simultaneously a number of these rods, a current of electricity will be transmitted to a line which will produce the same sound upon a similar harp at the distant end of the connecting wire. If vowels are sung into a piano, the pedal being down to allow free vibrations of the strings, not only will the voice be echoed back, but approximations to the quaities of the particular vowel sounds will be heard: and theory shows that if the piano had a very much larger number of strings to the octave, a *fac-simile* would be produced.



Section of Bell's Telephone.

A simple metal disc may be regarded as a harp with an infinity of forks or strings, and if by the vibrations of such a disc, under the influence of a musical note or vocal sound, characters can be given to an electric current similar to the motions of a particle of air concerned in the production of that sound, then the transmission of that current to the metal disc of a distant instrument should set up in it like mechanical or molecular motions, which, there transferred from its surface to another portion of the atmosphere, should repeat, or rather reproduce, in it sounds like those produced at the actuating origin. This particular species of electrical current Professor Bell terms undulatory.

The figure represents a section of one of Professor Bell's telephones, *half* the actual size. The wooden case is indicated by shading, and is lettered *a*. Within the cylindrical handle is the permanent magnet (*m*), above which is the soft iron core of the electro-magnet, with its surrounding coil or bobbin of fine insulated wire (*b*), contained in a cavity or chamber turned out of the expanded head of the case; the ends of the conducting wires from the bobbin pass from within the handle to the terminals (*t t*), to which is afterwards attached the cord by which the instrument is secured to the electric carrying wires. In front of the pole of the compound magnet is a small disc of ordinary tinned or japanned sheet iron (*d*) about the size of a crown piece. The insertion of this disc is managed in this way: The wooden box or cylindrical head is cut horizontally across, and a further slice being taken off the roof in the upper portion, the disc is gripped all round its outer margin by the bevelled edges of the two halves of the box when these are brought tightly together by screws. Over the central portion of the metal disc (*d*) is an orifice about half an inch in diameter which is expanded outward into a bell-mouth form (*e*), for speaking into or listening from. At the bottom of the wooden handle is a copper screw for adjusting the distance of the pole of the magnet (*m*) from the metal disc (*d*). Here is the whole affair: and simple enough. So simple indeed, that one wonders at the extremeness of its simplicity.

Batteries are dispensed with altogether; for it was found that even the residual magnetism left in the electro-magnet was sufficient; hence, the substitution of the permanent magnet. Enclosing the whole of the magnet in a coil of insulated wire was also found unnecessary; it was needful to surround the pole of the magnet alone. The needful extent of area and thickness of the metal disc has been also worked out, and experiments have shown that by varying the size, diameter and thickness of the iron plate, comparatively little change is brought about; the chief difference being a peculiar effect on the quality of the voice. Professor Bell states that he has produced distinct articulations from iron plates all the way from one inch to two feet in diameter, and from one sixty-fourth to three-eighths of an inch in thickness. If the plates be of uniform thickness and the diameters varied, there is with the small plate a perfectly distinct articulation, but a nasal twang. Enlarge the diameter, the nasal sound disappears; and a point is obtained when a good quality of telephonic voice is obtained. Increase the diameter yet more, and a coarse hollow drum-like effect is induced, which advances with the enlargement of the plate, until a reverberating sound is reached. If now the thickness of the plate be increased this effect disappears, and distinctness of articulation is again attained. But if the thickness be increased beyond this point, a return is made to the nasal quality of sound. The inference from these effects is that the vibrations which give rise to the articulate speech of the telephone may be molecular and not due to the vibration of the plate as a whole; but as audible sounds are said to be produced by vibrations of $\frac{1}{25000000}$ of an inch, this point is open to further very delicate investigations.

In laboratory experiments with artificial resistances, there is no impediment whatever to the free use of the Bell instruments through circuits equivalent to 6000 miles; and, indeed, there seems no practical limit to the distances at which conversations can be conducted. The longest actual distance which the inventor has been able to avail himself of has been the telegraph line from New York to Boston, in the United States, 258 miles. At the last meeting of the British Association, Mr. Preece asserted that he had conversed with others up to distances of thirty miles, and that through a quarter of a mile of wire he had heard Professor Bell "breathe, laugh, sneeze, cough, in fact make any sound the human voice can produce." It must be understood, however, that although messages spoken in the ordinary voice, or even whispered, are distinctly audible after miles of transmission, without any effort, this takes place only when the instrument is held like an ear-trumpet close to the ear; persons of the very quickest hearing fail to catch what is said at little more than a foot or two away. The most remarkable feature of Professor Bell's telephone, is its decided tendency, nothwithstanding its own metallic *timbre*, to represent the qualities of the speaker's voice.

Conversations were recently carried on through the submarine telegraph cable between Dover and Calais. This cable has four wires, and whilst one was in use for the telephone, the other three were carrying Morse messages between London and Glasgow to Paris, Calais and Lille. Nevertheless, the voice message was perfectly distinguishable. This cable is twenty-one miles and three quarters in length, and has a copper resistance of 236 British Association units. Telephonic intercourse was kept up along it for over two hours, in French and English speech, as well as by tunes played by a musical box. Conversations have also been also carried on through the postal wires between Manchester and Liverpool, and, still more recently, by Mr. Preece and Mr. Wilson, through the submarine cable between Dublin and Holyhead, a distance of a hundred miles. The inductive influence of other lines of telegraph wires in contiguity with the one in telephonic use is, however, rather embarrassing when those other wires are busy; but this influence, it is said, can be overcome and negatived.

The widest application of the telephone is, without doubt, only a mere question of time; for the one point that actual conversation can be carried on by every person who can speak, and that, too, without any special training in the manipulation of instruments or symbols, will ultimately ensure to telephonic telegraphy the preference over every other system.

THE TURPENTINES AND RESINOUS PRODUCTS OF THE CONIFERÆ.

BY DR. JULIUS MOREL,

Professor of Chemistry in the Industrial School, Ghent.

(*Continued from page* 344.)

In studying the various kinds of commercial turpentines mention has been made, according to the actual state of science, of their composition, and it has been evident how that composition is variable according to the species examined. Whatever may be the method of extraction of the essential oils, which will next be dealt with, whether from the turpentines or from the juniper or savin, they all resemble each other in a certain number of characters, and group themselves around oil of turpentine, which may be taken as a type. Further, all the essential oils of the Coniferæ are hydrocarbons that readily absorb oxygen from the air, and combining with it become resinified under its influence. Iodine reacts with them energetically and produces a detonation.

XV. OIL OF TURPENTINE.

Synonyms.—L.: Oleum Terebinthinæ; Oleum volatile Pini s. Laricis.—G.: Terpenthinöl.—F.: Esprit de Térébenthine; Essence de Térébenthine; Erypèle de Térébenthine.

Botanical Origin.—This is very various. In fact all the turpentines which contain a suitable proportion of volatile oil can yield such products varying but slightly in their properties. According to Planchon the commercial oils of turpentine are divided into the *French*, produced especially from the turpentine of *Pinus maritima* and *P. Pinaster;* the *German*, yielded by *Pinus sylvestris*, L., *Abies pectinata* and *A. excelsa*, DC.; the *Venetian*, extracted from *Larix Europœa;* and the *English*, a product extracted from the American turpentines yielded by *Pinus Tœda*, L., and *P. australis*, Mich. All these volatile oils are grouped under the common name of oil of turpentine, because of the analogies that exist between them; their distinguishing characters, as will be seen, are especially based upon their rotatory powers, some being dextrogyre and others lævogyre.

Preparation.—Oil of turpentine is prepared by submitting to distillation one or other of the turpentines that have been described. Thus obtained it is known as "crude" (*brute*), and generally contains certain acids, such as acetic acid, formic acid, and even some of the resin acids. In order to purify it it is submitted to rectification by redistilling it from water and carbonate of potash, carbonate of soda, or even lime.

In America the oil is prepared in copper stills capable of holding 500 to 2000 kilograms of turpentine. The distillation is effected without the use of water, and the oil passing through the worm is collected in the barrels in which it is to be carried away. When the rectification is effected with alkaline carbonates or lime, these bodies saturate the free acids and remain in the retort; the water that the oil still retains is removed by a fresh distillation over fused calcium chloride.

Dragendorff has made numerous experiments upon the rectification of essential oils, and especially with oil of turpentine. The following are his remarks upon the subject in the *Pharmaceutical Journal* (3rd ser., vol. vi., p. 641):—

"For this purpose they may either be carried over by a current of steam, or the oil may be distilled, with about six volumes of water, so that one part of the oil shall remain behind in the retort. In the former case, it must be laid down as a rule that the current of steam shall reach the oil under a pressure exceeding *one* atmosphere, or at a temperature above 100° C. The fact that the oil, of which the boiling point often lies far beyond 100° C., will pass over with the aqueous vapour has in it nothing surprising. It is otherwise in the distillation of oils which contain water dissolved in them. If in this case water and oil occur together in the distillate, they pass over at a pressure of one atmosphere and at a temperature not over, but under, 100° C., as Dragendorff has proved. The oil, therefore, becomes modified in its boiling point by the water present; and this is in accordance with what has already been observed by Magnus that liquids which are not miscible with each other, when heated together, will distil at a temperature lower than the boiling point of the most volatile."

For oil of turpentine, according to the quantity of water, the boiling point is between 96·5° and 98·5° C.

Dragendorff made his experiments "in a tubulated glass retort containing 200 c.c. of oil of turpentine, and into which a glass tube passed almost to the bottom. The latter was connected by means of tubing, as short as possible, and packed with cotton, with a flask in which water was heated to strong ebullition." The distillate produced was colourless, mobile, and of good odour; also the exact quantity of water required was used, so that the loss through becoming dissolved in the water distilling over was the smallest possible.

Properties.—Oil of turpentine, when pure, is colourless, of oleaginous consistency, and variable in density, boiling point and rotatory power, according to the kind of turpentine from which it has been extracted. It has a strong characteristic odour and a hot and burning taste. It is soluble in absolute alcohol, ether, chloroform, benzol, carbon bisulphide, and the fixed and volatile oils. Dilute alcohol dissolves it less readily; it requires 4 volumes of 90° alcohol, 8 volumes of 88°, and 12 volumes of 81°. Shaken with water, oil of turpentine communicates to the water its smell and taste. Oil of turpentine volatilizes without decomposition between 150° and 160° C. Cooled to —17° C. it deposits a crystalline hydrocarbon that liquefies at —7° C. The presence of oxygen in unrectified oil of turpentine, and even in some rectified oils, can be demonstrated by the addition of a little metallic sodium, which undergoes oxidation immediately, and hydrogen is set free. Chloride of antimony produces a very energetic reaction, accompanied by the evolution of heat and the formation of a yellow resinous mass. Iodine produces an energetic reaction with oil of turpentine, accompanied by a detonation louder in proportion as the oil is more recent. Nitric acid also reacts very energetically upon it. A mixture of nitric and sulphuric acids will give rise to such an elevation of temperature as to inflame the oil.

Gaseous hydrochloric acid forms with most of the oils of turpentine a combination, one portion of which separates under the form of crystals resembling camphor in their appearance. This is an "artificial camphor," having a rotatory power equal to, and in the same direction as, that shown by the oil that has been used in its preparation.

If exposed to the air, oil of turpentine easily becomes resinified by the action of oxygen, and besides the resin a certain amount of formic acid is formed. The resinous matter that is formed under such circumstances does not resemble any of the natural resins at present known. Moreover there is no evidence at present of the formation of resins by the simple oxidation of volatile oils. However, Hlaziwetz and Barth have obtained substances that approach very closely to the resins of the Coniferæ, by heating oil of turpentine, oil of savin, and other oils with an alcoholic solution of caustic potash in sealed tubes.

The presence of resin in oil of turpentine can be recognized not only by evaporating carefully after previous distillation, but by the addition of ammonia, which determines a white crystalline precipitate, and even the more or less complete solidification of the mass, according to the proportion of resin it contains. The presence of a centigram of colophony in 20 c.c. is sufficient to give with caustic ammonia a characteristic turbidity.

In contact with water, and especially in the presence of a small quantity of nitric acid, oil of turpentine will form a hydrate which is inodorous, tasteless, and soluble in hot water, alcohol and ether. This product has been described under the names hydrate of "terpilene" and "terpene."

According to C. T. Kingzett (*Pharm. Journ.* [3], vol. vii. p. 225), oil of turpentine, when oxidized by air in the presence of water, yields peroxide of hydrogen and camphoric acid (both of which may result from the action of water upon camphoric peroxide $C_{10}H_{14}O_4$), acetic acid, camphor, and certain other less definite substances. The oil itself increases in specific gravity, and contains after this treatment certain oxidized bodies, among which is a further quantity of this camphoric peroxide. Kingzett's process is now being carried out commercially in this country, the product being sent out as an antiseptic under the name "Sanitas."

Characteristic Reactions.—The physical and chemical characters of oil of turpentine that have been briefly given are not sufficient to enable an analysis of that substance to be made with certainty. It has only been since the appearance of the valuable memoir of Dragendorff, in the *Pharmaceutical Journal* in 1876, that we have been able to state precisely by the aid of a series of reactions whether the product offered in commerce is really pure. The reagents employed for this purpose are six in number.

1°. Chloroformic Solution of Bromine (1 part of bromine to 20 parts of chloroform).—Added in the proportion of 10 to 15 drops to 1 drop of oil of turpentine, crude or rectified, after a time it is completely decolorized.

2°. Impure Hydrate of Chloral, especially that which gives with oil of peppermint an intense red colour, is a very good reagent. If a few drops of this solution are added to one drop of oil of turpentine (pure or crude) placed in a watch glass, at first no coloration is produced, but after some time the oil is coloured pale red.

3°. Alcoholic Solution of Hydrochloric Acid, which can be employed either in the concentrated or dilute form. 1 drop of oil of turpentine (crude or rectified) treated with 15 to 20 drops of the reagent gives, when this is concentrated, a brownish yellow colour which disappears promptly leaving the mixture colourless. With the reagent diluted the coloration is less intense and disappears more slowly.

4°. Pure Concentrated Sulphuric Acid is employed by bringing into contact in a watch-glass 2 or 3 drops of the acid and 1 drop of the oil. A deep red colour is produced which becomes slightly paler with crude oil, but becomes blood red with the rectified oil.

5°. Frohde's Reagent, which contains 1 centigram of molybdate of sodium* in 1 c.c. of strong sulphuric acid, added in the proportion of 3 drops to 1 drop of oil of turpentine (crude or pure), determines a brownish coloration, which passes to a blood red. This reaction is more definite than that with sulphuric acid.

6°. Fuming Nitric Acid, added in the proportion of 3 to 5 drops to 1 drop of the oil (crude or pure), determines a very energetic reaction and produces a red colour that passes to brown.

7°. Picric Acid—5 to 10 drops of the oil added to 5 centigrams of this acid dissolves it with difficulty in the cold, but easily when heated, and gives with a pure oil a yellow solution that upon cooling yields a crystalline deposit. Ether dissolves this yellow matter and upon shaking the ethereal solution with water this vehicle separates a portion of the picric acid. The crude oil gives the same reaction, but an elevation of temperature brings the yellow solution to a blood red colour.

Quantitative Determination of Oil of Turpentine.—Osse, according to the statement of Dragendorff, was occupied in 1875 with this important question, not only for oil of turpentine but essential oils in general. The process is based upon the extraction of the essential oils by means of a solvent having a low boiling point, evaporation at the ordinary temperature of the solution so obtained, and weighing the residue. The solvent employed is light petroleum spirit, boiling below 40° C., which has been previously freed from its odour by distillation in the presence of fat. As might be expected, the evaporation of the petroleum spirit carries with it a certain quantity of essential oil, but the loss was found to be very small in operating upon small quantities, evaporating at a temperature about 15° C. in a current of dry air, seizing exactly the point of the complete disappearance of the solvent, and then closing hermetically the vessel in which the evaporation has taken place and weighing. The following is the method of procedure adopted by Osse:—

The solution is evaporated in a current of dry air (underneath a bell glass resting upon a ground glass plate) until the residue no longer presents more than a slight odour of petroleum; then it is weighed. The weighings are repeated several times after the watch-glass containing the oil had been exposed to the air for *one* minute. Starting at the point when the weighings show a constant diminution of weight per minute, after several weighings, the loss of the last is noted; from this is obtained what Osse calls the coefficient of evaporation. Osse admits that for oils of which the coefficient of evaporation exceeds one milligram per minute, commencing with the first weighing there is evaporated, besides the petroleum spirit, a quantity of essential oil equal to the coefficient of evaporation, and in his calculation of the quantity of essential oil found he adds as many times the coefficient of evaporation as evaporations and subsequent weighings have been made.

Oil of turpentine is one of those of which the coefficient of evaporation exceeds one milligram per minute; it is necessary therefore in making a quantitative analysis to have recourse to the correction just described. The following are results obtained by Osse:

0·0277 gram of oil of terpentine, dissolved in one c.c. of petroleum spirit, gave—

At the 1st weighing	0·0460	gram of residue.	
„ 2nd	0·0260	„	„
„ 3rd	0·0205	„	„
„ 4th	0·0170	„	„
„ 5th	0·0135	„	„

The difference between the 3rd and 4th and the

* Buckingham recommends the substitution of this salt by molybdate of ammonium.

4th and 5th weighing being 0·0035 gram, this figure was taken as the coefficient of evaporation. Therefore to the result of the 3rd weighing=0·0205 gram was added 0·0035×2=0·007, the total being 0·0275 gram. The same experiment, repeated a second time, gave 0·0267 gram. The difference therefore did not exceed 3·61 per cent. of the weight of the substance examined.

Osse also made some experiments with carbon bisulphide alone and combined with petroleum spirit; the results obtained were less satisfactory than those with spirit.

Composition.—Oil of turpentine, as met with in commerce, is a mixture of various hydrocarbons of analogous composition, corresponding to the formula $C_{10}H_{16}$, or multiples of that formula. These hydrocarbons vary among themselves in their boiling point and rotatory power. Berthelot has shown that if, instead of employing the usual processes of distillation, the precaution is taken of previously incorporating with the crude turpentine a mixture of carbonate of potassium and carbonate of lime, and afterwards distilling, then heating in a water-bath to a temperature between 60° and 80° C., a well defined hydrocarbon is obtained, answering to the formula $C_{10}H_{16}$, which is mobile, very refrangent, has a density of 0·863, boils at 151° C., and has, when prepared from common turpentine (from *Pinus maritima*, etc.), a rotatory power of 42·30° to the left.

(*To be continued.*)

NOTE ON THE SPECIFIC GRAVITY AND STRENGTH OF DIALYSED IRON.*

BY E. B. SHUTTLEWORTH.

There exists, at present, some difference of opinion in regard to the specific gravity of the ordinary medicinal solution of dialysed iron. In a paper read at the last meeting of the American Pharmaceutical Association, Dr. Pile stated the specific gravity of a solution containing 5 per cent. of oxide to be 1·029. In making some remarks on the subject, Dr. Squibb gave the sp. gr. at 1·03—(the third decimal figure I do not exactly recollect—while Professor Diehl said that according to Dr. Wagner, of Buda, by whom the remedy was first introduced to the medical profession, it should be 1·046. The latter statement is borne out by Dr. Hager and Mr. Grossinger, who examined Wagner's preparation, and it is also repeated or accepted in a number of papers which have since appeared.

In order to reconcile these difficulties and to determine the point for my own satisfaction, and also to ascertain whether the test of specific gravity may be relied on as an indication of the strength of this preparation, I have made a number of experiments, of which the results are subjoined.

It was premised that a thoroughly dialysed solution would contain more iron for a given specific gravity than one in which the process had not been completely carried out. This was of course found to be true, but not to the extent which might be at first imagined. The rule holds perfectly good with regard to solutions in which the diffusion has only just commenced, but after two or three days most of the hydrochloric acid, chloride of sodium, or chloride of ammonium will have passed through the septum, while a considerable portion of the chloride of iron will remain. Such a solution will not show much difference in iron strength to that containing nothing but the oxychloride.

* From the *Canadian Pharmaceutical Journal* for December, 1877.

I think that the differences above alluded to may be in great part accounted for by the supposition that the drying of the oxide was not carried in each case to the same extent. If 100 grains of a thoroughly dialysed solution be evaporated on a water-bath and the product be weighed when apparently dry, the quantity of residue will be much greater than if the drying be continued until the weight is constant. This residue, if heated in an evaporating dish over an open flame, will again lose weight, and if the product be placed in a platinum capsule and brought to a red heat a still further diminution will be observed. Wagner's solution, referred to by Professor Diehl as of sp. gr. 1·046, was estimated for the normal oxide—that obtained by calcination; Dr. Pile probably estimated his solution by evaporation over a water-bath, though, as far as my own experiments are concerned, I have not been able to obtain a solution of quite so low a specific gravity and which would yield 5 per cent. residue in a pulverulent condition, *if weighed at once and while warm.*

This brings me to a point which to the uninitiated would certainly, to say the least of it, be very puzzling. If the warm and apparently dry residue be weighed and then allowed to cool, it will be found to be appreciably heavier. In one hour five grains will have increased perhaps six per cent.; and after a night's exposure—according to the hygroscopic condition of the air—the five grains may have become six.

The following table shows the percentage weights obtained from several strengths of a solution which had been dialysed for twenty-four days, and which did not blacken infusion of galls:—

Sp. Gr.	Pulverulent on Water-Bath.	Well Dried on Water-Bath.	Exposed during one night.	Calcined.
1·046	—	5·6	—	5·0
1·040	5·5	5·0	6·0	—
1·038	5·2	4·7	5·6	4·3
1·034	5·0	4·3	—	—

It will thus be seen that three of the above solutions might be described in common language as containing five per cent. of oxide, though only the first is properly of that strength.

Taking into account the liability of strong and well dialysed solutions to become gelatinous, I think a liquor of 1·010 yielding, when evaporated and well dried over a water-bath, five per cent. of residue, best fitted for medical use. Such a solution keeps well; it can be readily estimated by the pharmacist—a simple evaporating dish being all that is required—and, moreover, the strength corresponds as nearly as possible with that of the ordinary tincture of perchloride of iron.

A word in regard to the asserted tastelessness of dialysed iron. I have now on hand a solution which has been dialysing for forty-two days and is quite gelatinous. It cannot, however, be strictly described as tasteless. Though it is not in the least ferruginous it is slightly styptic, and produces, when applied to the tongue, an effect similar to that of astringents. This is, I think, to be attributed to the precipitation of oxide, which occurs the moment the solution comes in contact with the saliva, thus giving rise to the sensation alluded to.

Provided, then, that a solution is deprived of ferruginous taste, that it is not distinctly *blackened* by infusion or tincture of galls, and does not give direct evidence of containing hydrochloric acid, I think the test of specific gravity may be, for common purposes, relied on.

PRESERVATIVE PROPERTIES OF EUCALYPTI.*

BY THOMAS TAYLOR.

In consideration of a request to investigate the preservative properties of the Eucalypti, I have made a series of experiments, as follows: Twelve glass jars, each

* Extract from the Report of the United States Commissioner of Agriculture.

holding one quart, were arranged side by side. In six of them I placed a quantity of the leaves of several species of the *Eucalyptus*, taking care that each jar should contain the leaves of a distinct species. The jars were then filled with pure water. Ground stoppers were used to exclude air and dust from the solution. Each jar was numbered, respectively, from one to six. No. 6 contained leaves of the *Eucalyptus globulus*. Seven other jars, numbering from seven to thirteen, were filled with solutions, and various plant leaves, as follows: No. 7 contained a solution of sulphate of quinine in the proportion of about 3 per cent. of the alkaloid. In this solution I immersed a foreign grape leaf. No. 8 contained a grape-leaf and pure water; No. 9, a grape-leaf and pure acetic acid; No. 10, equal parts water; No. 11, a large cinchona-leaf and a weak solution of the essential oil of the *Eucalyptus globulus*, made by immersing a few leaves of that plant in pure water, by which the water became impregnated with the oil. No. 13 contained water, a grape leaf, and about half an ounce of the flowers of sulphur. At the termination of ten days I found that nearly all the plant-leaves had fermented; the exceptions were those contained in numbers 6, 9, 10, 11, and 13. Although eucalyptol oil is very sparingly soluble in water, its weak solutions prove highly antiseptic and deodorizing; and when the amount of albuminoids held in solution is reasonably limited, they are preserved. Solutions of the alkaloids, and some of their medicinal preparations, may, therefore, be prevented from decaying by fermentation when alcohol cannot be used successfully with them. The foregoing results induced me to extend my experiments to other well-known essential odorous oils, first, to ascertain their relative value as antiseptics and deodorizers; second, whether their oxidizing power is proportional to the strength of their odours; and, third, their immediate chemical action on the soluble alkaline sulphides of potassium and ammonium. For this purpose I arranged a series of test-tubes, about ten inches in length by one in diameter, each of which I filled to within half an inch of the top with water, adding a few drops of an essential odorous oil, combining the mixture as well as could be done by shaking it. All of the essential oils are sparingly soluble in water. In this series of experiments I used the oils of bergamot, spearmint, cloves, caraway, cinnamon, lavender, peppermint, lemon, winter green, rosemary, origanum, and cajeput. The results demonstrate that several of them decompose the sulphide of potassium quickly, while others, although highly odorous, are slow deodorizers, and do not seem to decompose these sulphides under the conditions stated. Rosemary, peppermint, wintergreen, and lavender are of this class.

If concentrated solutions of the oils of pennyroyal, tincture of myrrh, the oil of rose geranium, and oil of horse-mint are combined in separate test-tubes with sulphide of ammonium, it will be found that pennyroyal and myrrh produce a heavier precipitate than either of the other two oils, rose geranium and horse-mint.

The oil of cloves oxidizes quickly the potassium of the sulphide and precipitates sulphur when both solutions are combined in concentrated form, and it also decomposes this sulphide when it is highly diluted; but it exhibits no decomposing properties when combined with the sulphide of ammonium. Concentrated sulphide of potassium and ammonium exhibit but very slight action on cajeput. Origanum decomposes concentrated sulphide of potassium, while it exhibits no reaction on the sulphide of ammonium. Turpentine and eucalyptol oil have a similar action on the concentrated solutions of potassium and ammonium sulphides; but the eucalyptol exhibits a higher precipitating power than turpentine or any other of the essential oils with which I have experimented.

It is generally believed that the atmosphere of pine forests is highly favourable to invalids suffering from pulmonary complaints, and it has been supposed that the oxidation of the oil of turpentine exuded from pine-trees, and of other essential oils, such as the odorous oils of flowers in the air, is attended by the formation of ozone, inasmuch as the oxidized oils and the air in their vicinity exhibit the reaction of ozone with potassium iodide and starch. Kingzett attributes the active properties of the oxidized turpentine oil to the formation of monohydrated terpene oxide $C_{10}H_{16}O.H_2O$, which was shown some time ago by Sobrero ('Ann. Ch. Pharm.', p. xxx. 106) to be formed when turpentine oil containing water is exposed to the sun's rays in a vessel filled with oxygen (see page 887, Watt's 'Chemistry,' second supplement), and it has been shown that the air of the country contains an odoriferous and oxidizing principle which imparts to it a peculiar odour and the power of bluing iodized red litmus paper; also of decolorizing blue litmus paper without previously reddening it, and of destroying bad odours. This principle is called ozone.*

When a varnish containing commercial turpentine is applied to a bronzed surface, the metallic powder is oxidized by the turpentine. If copper-bronze powder is combined with turpentine, the bronze is first oxidized and ultimately dissolved by it. Since, then, turpentine has an acid reaction on copper bronzed, it will necessarily have a reaction on the alkaline metals. When common oil of turpentine is added to the sulphide of potassium, the potassium is oxidized, and sulphur precipitated. In this way we may be able to explain *in part* the deodorizing action of essential oils on soluble sulphides and gaseous sulphur compounds. To test this, I poured an ounce of turpentine into a transparent glass quart jar, in the atmosphere of which I suspended a sheet of bibulous paper which was saturated with a composition of the iodide of potassium and starch. The mouth of the jar was quickly covered with a sheet of glass to exclude the action of the air. Within ten minutes the paper appeared brown. The turpentine had oxidized the potassium and liberated the iodine, which in turn coloured the starch purple; but, to render this fact more apparent, I combined a drop of turpentine with a drop of the composition of iodide of potassium and starch. When the composition became visibly brown to the naked eye, and was placed under a suitable power of the microscope, it was observed that many of the starch granules were stained purple by the iodine. Subsequent experiments with concentrated eucalyptus oil and the starch composition gave similar results. Had these experiments been made in a pine forest or plantation of *Eucalypti*, the liberation of the iodine, and consequent coloration of the starch-paper, would have been attributed to the presence of ozone in the atmosphere. Nearly all the essential oils give similar results when combined directly with the iodide of potassium and starch. Since the preceding experiments were made, I have placed a paper moistened in the starch composition in an inclosed atmosphere of turpentine, placing the jar containing it in a dark closet; but the action of the turpentine vapour seemed to be as powerful in darkness as in the presence of light.

Some suppose that ozone, or active oxygen, is in great abundance in the atmosphere of eucalyptus plantations, and, as a consequence, the poisonous gases of marshy districts in their vicinity are decomposed by it, ozone acting the part of an acid; while others have supposed that such unhealthy regions are purified by the rapid absorption of the marsh-waters, owing to the very great rapidity of the growth of the eucalyptus family. It is not my purpose to discredit the views of those who attribute so much importance to the production of ozone under such conditions, but to remind those who insist that oxidation of the gases of malarial districts, and the consequent improved healthy condition of them, in the presence of the essential oils of the eucalyptus family, or of other odoriferous plants, are not necessarily the result of ozone. Any acid or substance having an acid reaction will oxidize the potassium of iodide of potassium. My

* Ozone is supposed to be oxygen in a positive state, or allotropic form, having acid properties.

experiments demonstrate that eucalyptol, turpentine, benzole, or any of the essential oils will oxidize potassium when it is combined with iodine or sulphur; and we are, therefore, in a position to explain how the favourable changes and purifications of the atmosphere to some extent are affected, independent of the theory of ozone. Turpentine of commerce contains formic and succinic acid (Löwig); but turpentine itself is an oxidizable body, as has been shown, and will oxidize some foreign bodies in the atmosphere. Mix turpentine of commerce with caustic potash, and suspend in its atmosphere a slip of paper moistened with the starch mixture; after the lapse of twelve hours it will be found that the starch is colourless or tinged yellow, instead of a very dark purple; in this case demonstrating that the presence of an alkalic atmosphere may modify the oxidizing conditions. Place half an ounce of turpentine in a quart jar, and put in the jar a test-tube containing the sulphide of ammonium, which is very volatile, taking care that only the gases of each liquid will come in contact. Suspend in this mixed atmosphere a slip of the starch-paper * and exclude common air. After the lapse of twelve hours it will be found that the test-paper is saturated with the sulphide of ammonium, and no tinge of purple or other indication of free iodine is observed; in this case the atmosphere is highly alkaline.

If to an aqueous solution of iodide of potassium and starch a few drops of commercial turpentine be added, by agitation a purple colour will appear, first on the top, but ultimately the entire mass will appear beautifully stained. If a portion of the liquid be examined under a suitable power of the microscope, it will be seen that the starch granules have become swollen and are tinged a blue-purple. The granules have an appearance of partially-boiled starch, and remain suspended for a long period in the liquid. Slips of iodized starch-paper prepared with *very* weak solutions of iodide of potassium, hung in an inclosed atmosphere of turpentine, take a very slight tinge after a lapse of twelve hours. The same changes are observed when other essential oils are used, but when a saturated solution of the iodide of potassium and starch are used instead, a very deep colour is quickly obtained. Sometimes the colour will approach to blackness, but it is in reality a deep purple, as seen under the microscope. When the oil of bergamot is used with the weak solutions, a very slight change is effected; but should a drop of the starch mixture fall into this oil, it will make a very deep stain. Nearly all the essential oils behave in a similar manner under similar conditions. The vapour of benzole, supposed to be chemically pure, does not give any appreciable colour to iodized paper; but when droppings of the starch mixture are immersed in the benzole from ten to twenty hours, they become deeply stained brown or purplish. It will be seen that various substances of a very dissimilar character, chemically considered, give acid reaction; and those who favour the ozone theory in eucalyptus, coniferous, and other essential oils, will do well to consider the facts above recited. It is only by a full and faithful consideration of all the facts which relate to the changes and conditions that affect the (ozone) test-paper that a knowledge of its value or worthlessness may be understood.

The fleshy sides of the skins of animals may be preserved from putrefaction by rubbing on them eucalyptus oil. It may also be combined with plaster, and injected into the veins and arteries of animals for the purpose of preservation.

As a result of actual experiment, I find that beef or any animal matter may be preserved by it. I placed two ounces of solid beef in a glass jar with a few drops of this oil, securing the contents from contact with the atmosphere by means of a glass stopper. At the expiration of three months I examined the beef and found it fresh, and on cutting into it the fresh surfaces appeared of a healthy flesh colour. I examined the surface by removing portions of it and placing them in the usual manner under a power of about 350 diameters, but no organic germs of any kind were visible. I next removed the beef from the jar, and exposed it to an atmosphere of about 75 deg. F. Within twenty-four hours afterward the beef dried up, and became very hard, showing no sign of mouldiness or putrefaction. In consideration of these facts, I deem it probable that eucalyptus oil may be safely employed, and with advantage, in cases of humid gangrene, as it certainly will preserve animal matter from decay, and deodorize that which is putrescent.

The preceding experiments demonstrate that eucalyptus oil, turpentine, and, indeed, nearly all the essential oils, possess an oxidizing property. To speak in figurative language, they have the power to burn up or decompose some products deleterious to health, which are always present in malarial regions, and are well known as products of animal and vegetable decay.

* Paper dipped in a solution of iodide of potassium and starch.

CARDAMOM CULTIVATION IN MYSORE.*

Some time in February or March the felling party, one half of them provided with axes, and the rest with large hack-knives for clearing the underwood, proceed to the forest and commence operations by building, near some stream, a temporary hut to shelter them at night. The next morning the head man of the party, who is necessarily well acquainted with the forest, and who has previously chosen the sites for the projected gardens, points out to the coolies the trees that are to be felled. Half of the party then commence to clear the underwood, while the remainder set to work with their axes and fell the large forest trees. The Coorgs have an idea that it is of great importance that the ground should be well shaken by the fall of some heavy tree, and if from any cause a tree does not crash down with sufficient force, they fell another across it. Each plot generally consists of about the tenth part of an acre, and care is taken to leave about twenty or thirty yards of jungle between each garden, as well as not to make too many gardens in one year, lest there should be a too great and sudden diminution of the moisture, which is so much required by cardamom plants. From fifty to one hundred gardens are made annually, until the whole jungle is under cultivation. If represented on a plan a cardamom jungle fully cultivated would be not unlike a checkered board. In May, during the early rains of the south-west monsoon, the young plants shoot up in all the cleared grounds, but especially near to the root and stem of the fallen tree. By the October following they will have grown three or four inches, and by the ensuing February will have attained a height of about one foot, with from eight to ten leaves on each plant. The seed ripen in October, and in the fourth year, or about three years and a half from the springing of the plant, a small crop, called by the Coorgs "God fruit," will be gathered. At this time each rhizome will have thrown up two feet; the garden must be annually weeded. When trees have reached the height of about four feet, or say in the third year, a little culling will be required, for each plant must have six feet of clear ground left round it. In removing superfluous plants, care must be exercised in preserving the strongest and healthiest specimens. In the fifth year the plants will give a good crop, and will probably continue to do so for the following seven years, when they will begin to present a sickly and exhausted appearance. It will then be necessary to select some large trees from the surrounding jungle, and fell them right across the sickly plots. This is generally done during the months of February and March, when the lands were originally prepared for cardamoms, but may also be done with great advantage

* Reprinted from Elliott's 'Planter in Mysore.'

some month earlier. Young plants will then spring up as before, and many of the old plants will have their stems and racemes killed by the fall, but from their rhizomes fresh stems will shoot, and the plants will bear with increased vigour for the next eight years, when the same process of renovation will have to be gone through again. The year in which the forest trees are thus felled the cardamom plots naturally give but little or nothing, and during the ensuing year but a light crop will be gathered; but this very much depends upon the quality of the soil, and on this also depends the early or late coming into bearing of the original garden. A cardamom jungle if thus carefully worked never becomes exhausted, and the cultivation may be continued on the same land for an indefinite period. One rhizome will often have over twenty stems, and, as these die off (and they seldom last longer than seven or eight years), fresh ones spring up to supply their place. The fruit is occasionally borne on the upper part of the stem, but this is extremely rare, and I may mention that in Munzerabad I have never seen or heard of an instance of this departure from the ordinary habit of the plant. When from the stem four racemes are thrown out it is called by the natives the true or full crop; if three only, three-quarter crop; if two, half crop; and if only one, quarter crop. One raceme will have from eight to fourteen branches, and each branch from three to six pedicles. When the plant is grown under the most favourable conditions these branches are grown close together; when, however, the conditions are unfavourable, the racemes are long and weak, and the branches far apart.

TANNING MATERIALS OF SOUTH AMERICA.*

BY PROFESSOR MAX SIEWERT.

The tanning of heavy leather is one of the principal occupations of the northern provinces of the Argentine Republic. This country struggles under difficulties unknown in Europe, on account of the climate, which frequently causes the putrefaction of the skins during the process of tanning. It is therefore necessary to abridge as much as possible the duration of the operation. No rational method is followed in the manufacture, which is entirely empirical as yet. The tanners of the Old World prefer to employ the bark of the oak, which, although it does not possess a large quantity of tannin, produces an excellent article when the operation has been well conducted.

But the oak is not indigenous here, and has not yet been imported. The carob tree (Spanish algarrobo), which might be called the oak of the country, from its slow growth and general aspect, unfortunately does not possess a bark rich in tannin.

Nevertheless, we have the cebil in two varieties—the red and the white—forming in the provinces of Tucuman, Salta, and Jujui, immense forests, which cover the mountain slopes to a considerable height. The bark of the red cebil contains more tannin than that of the oak, but it has the unsuitable property of giving a characteristic red colour to the hides, which, above all, appears when the tanning is completed and drying commences. This disadvantage having made it desirable to find a tanning material which will give the customary appearance to the skins, all the trees of our flora have been submitted to chemical analysis. I have separately investigated the wood, bark, and leaves, and the subjoined table gives an adequate idea of their tannic importance. The figures speak for themselves, but I will add such descriptive and general information on them as seems necessary.

Red Cebil (*Acacia Cebil*, Gries.).—Experience, as well as chemical analysis, teaches us that the mature tree produces the greatest quantity of tannin, and that when the bark of old trees is used, the exterior layers, which are in general the hardest, should be rejected. I cannot affirm from my investigations that the trees of the plains contain more tannin than those of the mountains. The analyses not giving one constant result, I have been led to believe that the differences which have been frequently met with are all individual, and independent of the composition of the soil.

Experiments, the object of which was to isolate the tannin combined with the lime of the bark by boiling this with carbonate of soda, gave 1 per cent. of increase. The quantity of carbonate of soda was calculated from the weight of lime contained in the ash. It is remarkable that the wood holds no trace of tannin, whilst the leaves generally give one-half the quantity found in the bark.

White Cebil.—This tree is distinguished from the red species by its leaves, which are more finely feathered, and by the facility with which its bark dries and ceases to take part in the circulation of the tree. It therefore results that the tannic acid is very rapidly decomposed in the exterior of the bark, and becomes oxidized or else withdraws to the interior, according as the bark dries. The proportion of tannic acid contained in the exterior and interior parts of the bark is as one to ten.

The young trees of the two species of cebil contain almost the same quantity of tannin; their wood contains a little, and the quantity in the leaves is somewhat superior to the half of that found in the bark of good quality.

White Quebracho (*Aspidosperma Quebracho*).—The trees which bear this name in the province of Cordoba do not belong to the same species as the white quebracho of Salta. I do not believe that the climate could cause a variety of this tree; in my opinion they are different species. The leaves of the quebracho of Cordoba are armed at their extremities with small thorns, which the species of Salta does not possess. The form and size of the leaves are alike, although those of the northern province are thicker. The aspect of the trees is also the same, although the quantity of tannin is very different.

The white quebracho of Salta is very similar to the German oak, and little inferior to the red cebil, whilst its leaves are one of the richest tanning substances in all the Republic, since they contain 27·5 per cent. Moreover, the tannic solution of the bark, as well as that of the leaves, is almost colourless; the red colour imparted to the hide may therefore be prevented, by operating with a mixture of the cebil and the white quebracho.

Espinillo (*Acacia Cavenia*).—This tree is more disseminated in the country than the algarrobo. It attains a greater or less height, according to the nature of the soil, but never exceeds twelve feet. It is recognized by its tender and finely feathered leaves and numerous thorns and fruit. The wood and leaves contain but little tannin (0·56 and 0·93 respectively); the bark (5·84), even if it contained more, it would not serve for tannin, because it is too thin and too difficult to separate from the trunk. The fruit, on the contrary, is rich in tannin, and although the seeds contain a very small quantity (12·03), the husks or shells contain 33·2 of pure tannin.

Algarrobo, black and white (*Prosopis Algarrobo.*—These two magnificent representatives of the Mimosa family thoroughly overspread our country. Unfortunately in the populated districts they will soon disappear, on account of their slow growth, the small care taken of them, and the complete want of new plantations. The wood of the algarrobo is of extraordinary strength, therefore it is employed for all purposes.

It is not known why the designations, black and white, have been given to the two species. The flowers of both are white; the leaves of the black algarrobo are more finely feathered, and its fruit spotted with black and red, is a little longer and narrower than that of the species called white, whose wood is dark brown, whilst that of

* From the *Journal of Applied Science*, January 1, 1878.

the species called black is much lighter in colour and almost white in the young trees.

When the aged white algarrobo, with a trunk of more than a foot in diameter, is cut, a black and viscous liquid, bitter to the taste, escapes from the vessels nearest the bark; it contains much tannic acid.

The leaves, the bark and the wood of the two species of algarrobo are equally poor in tannin; they are therefore of no interest to tanners. Their economic importance is however great, not only on account of their magnificent timber, but also for the fruit, which is an excellent food for domestic animals and even for man. A glance at the following analysis will prove this assertion:—

	Fruit of Black Algarrobo.		Fruit of White Algarrobo.
Water	16·26	...	10·84
Fat	0·26	...	0·43
Sugar	37·63	...	25·21
Starch	11·24	...	16·71
Protein	7·37	...	10·25
Cellulose	11·79	...	
Organic acids, pectin and non-nitrogenous nutritive substances	14·20	...	23·31
Ash	1·25	...	2·03
	100·		100·

The sugar in the fruit is identical with that contained in the grape and the apple, consequently it is very fermentable: therefore, the country people make an alcoholic sparkling drink from the fruit after macerating it in water, which they call aloja. That of the black algarrobo is preferred for this purpose, and the fermentation is caused by the protein substances which it contains. Here is the composition of the ashes of these fruits:—

	Black Algarrobo.		White Algarrobo.
Silicate of Lime	2·70	...	—
Silicate of Potash	—	...	5·84
Sulphate of Lime	4·23	...	6·82
Phosphate of Lime	26·20	...	24·92
„ Magnesia	—	...	8·70
Carbonate of Lime	5·14	...	—
„ Magnesia	9·30	...	2·73
„ Potash	7·11	...	31·05
Chlorate of Potash	44·99	...	19·50
Oxide of Iron	0·33	...	0·44
	100·		100·

The ashes, entirely destitute of soda, manifest such a large quantity of the salts of potash and of the phosphates, as to prove that this fruit is clearly of great importance as food. In several districts of the country it is collected by the population, and forms their principal nourishment during the winter.

The algarrobillo, the wild walnut, the tipa, the coco or cochuchu (*Xanthoxylum Coco*), the tala (*Celtis Tala*), the lapacho (*Tecoma asper*, Gries.), the chanar (*Gourliaca decorticans*), and the cedar, are only of secondary importance to the tanner. We will make special mention, however, of the lecheron and the molles.

Lecheron.—In its leaves, its height, and its branches, this tree bears an external resemblance to the willow of Europe, and, like it, prefers a humid or marshy soil.

Its name, derived from *leche* (Spanish for milk), is due to its property, when a leaf or branch is cut or broken, of exuding a species of white sap, similar to the milky juice of the euphorbia. The leaves contain but one-third part of the tannic acid of the bark, and the wood is entirely destitute of it. Although the bark only contains ten per cent. of tannin, it merits attention from its freedom from colour. The lecheron, moreover, has the advantage of being widely disseminated, and it grows much more rapidly than the cebil.

Molles.—In this country a number of trees and plants are designated by this name, although they bear no resemblance to each other, either in appearance of leaves, flowers, or fruit, and in reality belong to different families.

To distinguish them a qualifying term is added to the generic name, such as molle for drinking, molle for tanning, molle for dyeing, etc. The "molle a biber," literally good for drinking (*Lithrœa Gilliesii*), is a handsome tree, found in the mountainous regions, which is utilized in different ways. The sweet and aromatic fruit is employed, as also an infusion of its leaves, in the manufacture of a refreshing drink, slightly alcoholic, a species of "aloja." The leaves contain 0·25 of colourless tannin; infused in water they serve as a black dye, and also to prepare a species of ink. Molle for dyeing and tanning is a species of *Duvana*. This variety contains more tannin than the preceding, and is used both for dyeing and for tanning. For this purpose the fruit is gathered before its maturity, when it is no larger than a grain of vetch.

The sprouts of a year old, despoiled of their leaves and fruit, do not contain more than 4·6 per cent. of tannic acid, whilst the leaves and fruit contain from 19·2 to 20. This variety of the tree does not exceed the height of twelve feet, and its leaves are very small. It is, therefore, difficult to procure large quantities; nevertheless, were the inhabitants to take the trouble to pick the leaves and the fruit from the dried branches, something could be made out of this rich tanning substance, especially in view of the fact that it is almost colourless.

Tannic acid contained in 100 parts of the following substances, previously dried in the air:—

Trees.	Wood.	Bark.	Leaves.
Red Cebil, young	—	9·20	6·60
„ full grown	—	13·00	
„ old	—	14·40	
„ with carbonate of soda	—	15·50	
White Cebil, adult	2·14	8·00	7·30
„ old outside parts	—	1·17	
„ „ inside parts	—	11·84	
White Quebracho, Cordoba	0·27	—	0·10
„ „ Salta	—	12·00	27·50
Red „ „	—	7·41	—
Flexible Quebracho, Cordoba	0·21	—	0·12
Algarrobillo	0·18	—	0·18
Black Algarrobo	0·35	2·40	0·22
White „	0·29	2·64	0·27
Wild Nogal, or Walnut	5·00	6·40	2·74
Young Tipa	—	4·00	2·83
Old Tipa	—	2·64	
Lecheron	—	9·68	3·33
Cochuchu	6·13	4·36	—
Lapacho	1·36	2·72	4·76
Tala	0·32	—	0·21
Chanar	0·51	—	0·55
Cedar	5·61	6·83	—
Molle (for drinking)	—	—	8·55
Molle (dye stuff)	—	—	19·2
Algarrobillo of Guayacan, Salta	—	4·60	21·11

THE MEDICINAL CHLORINE-DERIVATIVES OF ALCOHOL.*

Among the chemicals which have been adopted into the list of medical agents, the chlorine-derivatives of alcohol occupy a very prominent place. Starting from the single chloroform, which came into use about 1831, their number has since then steadily increased, until there are now no less than about ten such compounds. Many of these are so closely allied in properties, that a sharp determination of boiling-point and specific gravity is necessary to distinguish them. In determining the

* From a paper by J. Biel, in *Pharm. Zeit. f. Russl.* 1877, No. 11, and a paper in *L'Union Pharm.*, 1877, 181, with additions by Ed. N. R. From *New Remedies*, October 1877.

boiling-point, it may be incidentally remarked, the thermometer must not dip into the liquid, but must be wholly immersed in the vapour of the boiling liquid, and the latter must be carefully distilled to dryness.

Since nearly all these bodies are at present obtained as by-products in the preparation of chloral hydrate, we shall first describe the preparation of the latter, as carried on at a large scale.

Chloral Hydrate. Into a series of 30 to 40 large glass carboys, each of which contains 108 to 144 pounds of 98 per cent. alcohol, a current of chlorine gas, washed and dried by sulphuric acid, is passed without intermission for twelve to fourteen days. In the beginning of the operation the action is sufficiently energetic to necessitate the cooling of the carboys, while towards the end they must be warmed to 60 and 75° C. (140 to 167° F.). As soon as the liquid in the carboys has reached a specific gravity of 1·400, the chlorination is interrupted, the chlorinated alcohol is transferred to copper stills lined with lead, and carefully boiled with an equal weight of sulphuric acid. This causes the elimination of large quantities of *ethyl chloride* gas (hydrochloric ether C_2H_5Cl), hydrochloric acid, and a whole series of by-products, which are condensed. After a while, chloral passes over, which boils at 94° (C. 201·2° F.). A rise of the thermometer to 100° C. (212° F.), indicates that all chloral has passed over, and the distillation is stopped. The distilled chloral, a colourless liquid, is neutralized with chalk, again distilled, the distillate brought into contact with just sufficient water to form the solid hydrate, and rapidly cooled off. The mass thereby congeals, and forms the product known as "chloral hydrate in crusts." More recently this is being displaced by chloral hydrate crystallized from boiling chloroform, which forms brilliant pellucid rhombohedra, and is much more capable of resisting change by exposure to air than the ordinary kind.

Soon after the discovery of chloral, a number of works on the largest scale were erected for its preparation; but competition soon lowered the market price of the product to such a degree that it became a question of life and existence with some manufacturers to find use for the large quantity of apparently useless by-products obtained. In this way Kraemer, of Berlin, who was supplied with material by Schering's factory, discovered in these accompanying products large quantities of *Monochlorinated ethyl chloride*, or *Dichlorethane* ($C_2H_4Cl_2$, æthyliden-chloride), and afterwards, together with Pinner, he discovered a new chloral, which was named *croton-chloral*, and which was examined therapeutically by Liebreich, who proved it to be a valuable agent. Kraemer also believed to have recognized in the mixture small quantities of *ethene chloride* ($C_2H_4Cl_2$, Dutch liquid); but this was disproved by Geuther, Stapf, and Staedel.

To arrive at a clear understanding of the origin of these secondary products, it is necessary to study the chemical reactions occurring during the generation of chloral:

Chlorine acting upon anhydrous alcohol produces in the first place *aldehyde:*

$$C_2H_6O + Cl_2 = C_2H_4O + 2\,HCl$$
$$\text{alcohol} + \text{chlorine} = \textit{aldehyde} + \text{hydrochloric acid.}$$

This, with more alcohol, forms *acetal:*

$$C_2H_4O + 2C_2H_6O = C_2H_4(C_2H_5O)_2 + H_2O$$
$$\text{aldehyde} + \text{alcohol} = \textit{acetal} + \text{water,}$$

which, by substitution of chlorine for hydrogen, forms *trichloracetal:*

$$C_2H_4(C_2H_5O)_2 + Cl_6 = C_2HCl_3(C_2H_5O)_2 + 3HCl$$
$$\text{acetal} \quad \text{chlorine} = \textit{trichloracetal} + \text{hydrochloric acid.}$$

This yields, with the generated hydrochloric acid, *chloral alcoholate* and *ethyl chloride:*

$$C_2HCl_3(C_2H_5O)_2 + HCl = C_2HCl_3(C_2H_6O_2) + C_2H_5Cl$$
$$\text{trichloracetal} + \text{hydrochloric acid} = \textit{chloral alcholate} + \textit{ethyl chloride.}$$

Most of the latter is decomposed with some of the still present alcohol to *ether:*

$$C_2H_5Cl + C_2H_6O_2 = (C_2H_5)_2O + HCl$$
$$\text{ethyl chloride} + \text{alcohol} = \textit{ether} + \text{hydrochloric acid}$$

which is converted by fresh chlorine into mono-, bi-, tri-, and finally, *tetrachlorinated* (*ethylic*) *ether:*

$$(C_2H_5)_2O \text{ or } C_2H_5.O.C_2H_5 + 4Cl_2 = C_4H_6Cl_4O \text{ or } C_2H_5.O.C_2HCl_4 + 4\,HCl$$
$$\text{ether} + \text{chlorine} = \textit{tetrachlorinated ether} + \text{hydrochloric acid.}$$

During the subsequent distillation with concentrated sulphuric acid, the generated chloral alcoholate splits into *chloral* and *ethyl-sulphuric acid:*

$$C_2HCl_3(C_2H_6O_2) + H_2SO_4 = C_2HCl_3O + H_2O + (C_2H_5)HSO_4$$
$$\text{chloral alcholate} + \text{sulphuric acid} = \text{chloral} + \text{water} + \textit{ethyl-sulphuric acid,}$$

and the tetrachlorinated ether undergoes the same change:

$$C_2H_5.O.C_2HCl_4 + H_2SO_4 = C_2HCl_3O + HCl + (C_2H_5)HSO_4$$
$$\text{tetrachlorinated ether} + \text{sulphuric acid} = \textit{chloral} + \text{hydrochloric acid} + \textit{ethyl-sulphuric acid,}$$

and the ethyl-sulphuric reacts with muriatic acid to form *sulphuric acid* and *ethyl chloride:*

$$(C_2H_5)HSO_4 + HCl = H_2SO_4 + C_3H_5Cl$$
$$\text{ethyl-sulphuric acid} + \text{hydrochloric acid} = \text{sulphuric acid} + \textit{ethyl chloride.}$$

On the other hand, if chlorine continues to act upon tetrachlorinated ether, there is produced *pentachlorinated ether*, $C_2H_5.O\text{-}C_2Cl_5$, which has a specific gravity of 1·650, and *does not yield chloral*, when treated with sulphuric acid. This is the reason why, in the manufacture of chloral, the current of chlorine gas is interrupted, when the liquid in the carboys has reached a specific gravity of 1·400.

From the *ethyl chloride* generated during the process, chlorine produces the following substitution-products:—

(C_2H_5Cl ethyl chloride, or chlorethane);
$C_2H_4Cl_2$ di-bhlorethane (æthyliden-chloride);
$C_2H_3Cl_3$ tri-chlorethane);
$C_2H_2Cl_4$ tetra-chlorethane);
C_2HCl_5 penta-chlorethane);
C_2Cl_6 carbon hexachloride, or rather carbon trichloride, a crystalline substance identical with that produced by the action of chlorine gas upon the Dutch liquid.

A very variable mixture of the middle members of this series is at present an article of commerce under the name of *Liquor anæstheticus.* Another similar mixture, containing the lower members, is the *Æther anæstheticus Aranii*, boiling between 64° and 100° C. (140-212° F.); and the *Æther anæstheticus Wiggers*, which contains the higher chlorides, and boils between 100 and 140° C. (212–184° F.)

As regards the other chloral, *croton-chloral*, or, as it is now more correctly termed, *butyl-chloral*, the investigations have not yet led to such detailed results. We are, however, certain that it is produced by the chlorination of two associated molecules of aldehyde. As croton-chloral its formula would be $C_4H_3Cl_3O$; but as butyl-chloral its formula is $C_4H_5Cl_3O$.*

(*To be continued.*)

* The name *croton*-chloral is owing to the relationship of this compound to *crotonic* acid found in *Croton Tiglium.* Crotonic acid, isomeric with methacrylic acid is $C_4H_6O_2$; croton-aldehyde, C_4H_6O; croton-chloral, $C_4H_3Cl_3O$. Starting from *butyric acid*, $C_4H_8O_2$, we have butyl-aldehyde, C_4H_8O, and butyl-chloral, $C_4H_5Cl_3O$.

The Pharmaceutical Journal.

SATURDAY, JANUARY 12, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE LIQUEFACTION OF THE GASES.

DURING the last fortnight a considerable amount of interest has been excited in the scientific world, and in fact outside of it, by the announcement that what had been foreseen as possible by the father of modern chemistry, but had foiled the utmost efforts of DAVY, FARADAY, and others to realize, had been demonstrated almost simultaneously by a French iron-master and a Swiss ice manufacturer, and that oxygen, nitrogen, and hydrogen, the gases which had longest resisted compression into the liquid state, had been at last conquered. A century ago, LAVOISIER, exercising his scientific imagination, theorized as to what change might take place in the substances that compose the globe if the temperature underwent a violent change, such, for instance as might follow were the earth suddenly transported to a region where the ordinary temperature exceeded that of boiling water, or into a very cold one similar to those occupied by Jupiter and Saturn. In the latter case he conjectured that the water at present forming our rivers and seas, and most of the liquids known to us, would be transformed into solids, whilst the atmosphere, or at least a portion of the aeriform substances of which it is composed, would cease to exist in the state of an invisible fluid, but would become liquid, producing new, and at that time, unknown liquids. How universal this change would be is shown by these latest researches of MM. CAILLETET and PICTET.

The first to accomplish the conditions necessary to the liquefaction of a permanent gas were probably MONGE and CLOUET, who at the end of the last century claimed to have liquefied sulphurous acid gas by cooling; NORTHMORE, who in 1805 liquefied chlorine; MORVEAU who liquefied ammonia; and STROMEYER, who liquefied arseniuretted hydrogen gas. Very little regard was paid to these experiments, however, at the time, the results being partially, but as it appears probably erroneously, attributed to the presence of small quantities of water. But the true advance began in 1823, when FARADAY, whilst examining, at the suggestion of Sir HUMPHREY DAVY, the solid hydrate of chlorine, found that when this substance was heated to 100° in a sealed tube it was decomposed, forming two layers, one consisting of chlorine in the liquid state, which it had assumed through the pressure resulting upon the dissociation, and the other of water, containing a little chlorine in solution. DAVY, who claimed to have foreseen this as an alternative result, immediately made some other experiments in the same direction, and at the same meeting of the Royal Society to which he communicated FARADAY'S memoir, he stated that he had liquefied hydrochloric acid gas by partially heating a sealed tube containing muriate of ammonia and concentrated sulphuric acid, and that he believed by substituting carbonate for muriate of ammonia carbonic acid might be obtained in the liquid state.

FARADAY continued his researches, and a few weeks later he was able to announce that by similar means he had succeeded in condensing to a liquid not only carbonic acid, but also sulphurous acid, sulphuretted hydrogen, euchlorine, nitrous oxide, cyanogen, and ammonia, and to describe some of the properties belonging to them as liquids. Experiments made at the same time, however, with oxygen, hydrogen, fluoboracic acid, fluosilicic acid, and phosphuretted hydrogen gases failed, although all of them were subjected to great pressure. In the same year Sir HUMPHREY DAVY published a memoir on the application of liquids formed by the condensation of gases as mechanical agents.

The research was continued by other investigators at home and abroad, but with little result beyond some modifications in the processes, although in 1835, THILORIER succeeded in carrying the condensation further, and obtained carbonic acid as a solid, it being the first gas brought to that condition. In 1845 FARADAY took up the work again, moved partly by the hope, as he says, of seeing "nitrogen, oxygen and hydrogen, either as liquid or solid bodies, and the latter probably as a metal." Although he was foiled in each of these particulars, he was successful in many others, using the combined influences of pressure and cold, the memoir describing his research and results forming virtually the latest stage in the history of the subject until within the last few weeks. All the known gases, with the exception of oxygen, hydrogen, nitrogen, nitric oxide, carbonic oxide and coal gas, were successively condensed to liquids, and many of them to solids. With respect to the ultimate fate of the remainder, FARADAY'S opinion may be estimated from his cautious remark that after carrying the pressure of oxygen to 58·5 atmospheres, the cement of a joint gave way, and he "could carry the observation no further with that apparatus."

It was left for CAILLETET to resume the progress in this investigation, and a few weeks since it was announced that nitric oxide, one of the few remaining refractory gases, had given way under his manipulation. On the 24th of last month the French Academy of Sciences was gratified by the announcement that oxygen had at last been liquefied in Geneva by PICTET, but greater was the surprise when it appeared that the Secretary of the Academy had had in his possession for nearly three weeks a sealed packet, stating that, CAILLETET, following up his recent work with nitric oxide, had attained a similar result with oxygen and carbonic oxide. Only another week elapsed and then CAILLETET was able to show that the end was full in view, for whilst nitrogen and atmospheric air had been unmistakably liquefied, hydrogen submitted to similar conditions gave indications that admit of little or no doubt that it had passed from the gaseous to the liquid state. The methods adopted by these investigators in obtaining their remarkable results will be found amply described in another part of this Journal.

It will be obvious upon reading the account given that the work is not yet done. Neither M. CAILLETET nor M. PICTET has obtained more than a momentary glance at the precious liquids. Before the research can be said to be complete a way must be found of obtaining and retaining these bodies in the liquid form, so that their nature and properties may be more closely studied. Nevertheless, that such good work has been done by two investigators, who appear to be engaged also in business pursuits, is a notable fact in the scientific history of their respective countries.

THE CHEMISTS' BALL.

No doubt many of our readers will have made themselves acquainted with the subject matter of an advertisement that has already appeared in respect to the Chemists' Annual Ball. To ensure as far as possible, however, that the subject shall not escape notice, it will be as well, perhaps, to repeat here that the Twelfth Annual Ball is to be held on Wednesday next, in Willis's Rooms. A list of the Stewards, from whom tickets may be had, will be found on another page. This annual gathering has now become so firmly established in the good opinion of many of our pharmaceutical brethren that it would be almost an impertinence to do more than call attention to the fact that the next is close at hand.

DEATH OF FRANCOIS VINCENT RASPAIL.

THE death has been announced from France of M. RASPAIL, who has played many parts during his long life, and created no inconsiderable stir both as a would-be medical and political reformer. Originally intending to follow the legal profession, he became successively botanist, zoologist, chemist, and doctor, but, above all, a politician. In camphor he saw, or pretended to see, a panacea, and camphor formed the basis of the specialities that have become associated with his name. M. RASPAIL was born in 1794, but it will be remembered that so recently as 1874 he was condemned to a fine and one year's imprisonment for an offence which was the outcome of his extreme political opinions.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A MEETING of the above Association will be held at 17, Bloomsbury Square, on Thursday evening, January 17, when a paper will be read by Mr. ALLEN, on "Some Odds and Ends of Science some Two Hundred Years Ago."

Provincial Transactions.

ABERDEEN SOCIETY OF CHEMISTS AND DRUGGISTS.

The opening lecture of the recently formed joint Society was delivered on Tuesday, December 18, 1877, by Mr. D. Ritchie, Market Street.

Mr. James Paterson (of William Paterson and Sons) occupied the chair, and remarked on the good attendance, expressing a desire that the meetings would be alike patronized by masters and assistants.

Mr. Ritchie then delivered a very interesting lecture upon the "Chemical Composition and Formation of the Various Tissues of the Human Body," amply illustrating his lecture with specimens of blood and bone, separated into their various proximate constituents; also with a display of life-sized diagrams of the osseous, muscular, nervous, and arterial systems. The demonstrations from these objects were listened to with great attention and were much appreciated by the large audience.

Hearty votes of thanks to the Lecturer and Chairman terminated the proceedings.

The next lecture is to be delivered during the present month by Mr. Miller, of the Sandilands Chemical Works, upon the "Coal Tar Products."

The Society's social meeting is expected to take place during February.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

ASSISTANTS' SECTION.

The second meeting of the present session was held in Anderson's College, on Wednesday, 19th Dec. In the absence of the Vice-President, Mr. R. A. Taylor took the chair. The minutes of last meeting having been read and confirmed, Mr. W. Simpson was unanimously elected President in room of Mr. Boa, resigned.

Mr. W. Paris then read a paper on "Phosphorus," in which he described the various processes which have been employed in manufacturing it from its accidental discovery by Brandt in 1677 up to the present time, and explained, by equations, the present method of manufacturing it from bone ash. He also gave the method of purification, and said he believed phosphorus was best administered medicinally in solution in cod liver oil.

At the close of the paper the reader was awarded the usual vote of thanks.

The desirability of having a festival in direct connection with the Assistants' Section, came up for consideration. After a number of the members had spoken in favour of the movement, Mr. G. Arnott proposed and Mr. W. T. Law seconded that a supper be held.

Mr. Ballock moved, as an amendement, that a conversazione and ball be held, which was seconded by Mr. De Nauce.

On a vote being taken the motion was declared carried by a large majority. A committee was afterwards appointed to carry out arrangements.

Mr. W. Philp was elected Assistant-Librarian, and Messrs. Arnot, Blain, and McLeish members of Committee. After a few new members were proposed and elected, the meeting was brought to a close.

Proceedings of Scientific Societies.

PARIS ACADEMIE DES SCIENCES.

THE LIQUEFACTION OF OXYGEN, NITROGEN, HYDROGEN, AND ATMOSPHERIC AIR.

Towards the end of last month considerable interest was excited by the announcement that the liquefaction of oxygen had been effected at Geneva by M. Raoul Pictet, on the 22nd of December. When, however, the subject came before the Academy of Sciences at its *séance* on the 24th, the interest was heightened by the announcement that M. Pictet had been to some extent anticipated, in that M. Cailletet, who a short time since succeeded in liquefying binoxide of nitrogen, had also effected the liquefaction of oxygen and of carbonic oxide on the 2nd of December, although in consequence of some consideration as to his pending election to the body instead of the fact being published at once a record of it had been entrusted in a sealed packet to the custody of the Secretary to the Academy on the 3rd. At the sitting of the Academy on the 31st December it was announced that M. Cailletet had succeeded in liquefying nitrogen, hydrogen, and atmospheric air. The following account of the operations by which these results were effected is taken from *Comptes Rendus* of December 24 and 31.

To give M. Cailletet precedence. The following are the terms in which M. Cailletet communicated his success with oxygen and carbonic oxide to his old master, M. Sainte-Claire Deville, and which formed the basis of the sealed packet:—

"I am anxious to tell you first and without the loss of a moment that I have to-day liquefied carbonic oxide and oxygen. I am, perhaps, wrong to say liquefy, for at the temperature obtained by the evaporation of sulphurous acid, *i.e.*, —29° and 300 atmospheres, I do not see the liquid, but a fog so thick that I may conclude it to be a vapour very near its point of liquefaction. I am writing to-day to M. Deleuil for protoxide of nitrogen, by the help of which I shall, no doubt, be able to watch the flow of a stream of carbonic oxide and oxygen.

"P.S. I have just made an experiment that puts my mind at rest. I compressed hydrogen at 300 atmospheres, and after cooling at —28°, I allowed it to expand suddenly. There was no trace of fog in the tube. My gases (CO and O) are therefore near upon liquefaction, this fog being produced only with vapours near liquefying. M. Berthelot's anticipations are, consequently, being completely realized."

The following is the more detailed account read before the Academy on the 24th of December:—

"If oxygen or pure carbonic oxide be enclosed in a tube of the form I have previously described, and placed in the compression apparatus already exhibited before the Academy,* and then the gas be brought down to a temperature of —29° by means of sulphurous acid at the pressure of about 300 atmospheres, these two gases retain their gaseous condition. But if they are suddenly allowed to expand, so as to produce, according to Poisson's law, a temperature of at least 200° below the initial temperature, immediately an intense fog produced by the liquefaction and perhaps solidification of the oxygen or carbonic oxide become perceptible.

"This phenomenon is observed also on the expansion of carbonic acid and the protoxide and binoxide of nitrogen when under strong pressure.

"This fog is produced with oxygen even when the gas is at the common temperature, provided time is given for the escape of the heat it acquires by the mere act of compression. This I demonstrated by experiments conducted on Sunday, December 16, at the chemical laboratory of the Ecole Normale Supérieure, before a number of scientific men, among whom were some members of the Academy of Sciences. I had hoped to find at Paris, together with the materials necessary for the production of a high degree of cold (protoxide of nitrogen or liquid carbonic acid), a pump capable of taking the place of my compression apparatus at Châtillon-sur-Seine. Unfortunately, a pump well-fixed and suited to this kind of experiment could not be found at Paris, and I was obliged to send to Châtillon-sur-Seine for the refrigerating material for collecting the condensed matters on the walls of the tube.

"To know whether oxygen and carbonic oxide are in a liquid or solid form in the fog, would require an optical experiment, more easy to imagine than to carry out, on account of the form and thickness of the tubes containing them. Chemical reactions will also allow of the demonstration that the oxygen is not transformed into ozone in the act of compression. These questions I shall endeavour to solve with the help of apparatus which I am now having made.

"Under the same conditions of temperature and pressure even the most rapid expansion of pure hydrogen gives no trace of nebulous matter. There remains therefore only nitrogen to study, and the small solubility of this gas in water leads me to suppose that it will be very refractory to any change of condition."

At the meeting of the following week, however, M. Cailletet was able to report a great advance towards the solution of this problem in the following "Note on the Condensation of Reputedly Incoercible Gases":—

"I have continued my experiments upon the liquefaction of gas, and I am happy to announce that I have succeeded in liquefying nitrogen and atmospheric air. Hydrogen itself has given indications of liquefaction as will presently appear. The following are some details of my experiments:—

"*Nitrogen.*—Pure and dry nitrogen, submitted to a pressure of about 200 atmospheres, at a temperature of +13°, and the pressure then suddenly relaxed, is condensed in the clearest manner. There is produced at first a matter similar to a powdery liquid (*liquide pulvérisé*), in particles of an appreciable volume; then the liquid gradually disappears from the sides towards the centre of the tube, forming at last a sort of vertical column directed along the axis of the tube itself. The total duration of the phenomenon is about three seconds.

"These appearances leave no doubt of the true character of the phenomenon. I first made the experiment at home, at the temperature of —29°, and I repeated it yesterday, a great number of times in the laboratory of the Normal School, in the presence of several scientific men and members of the Academy, among whom I may mention, with his consent, the venerated M. Boussingault.

"*Hydrogen.*—Hydrogen has always been regarded as the most incoercible gas, because of its slight density and the nearly complete conformity of its mechanical properties with those of a perfect gas. It was therefore only with extreme distrust as to the result that I decided to submit it to the same tests as have determined the liquefaction of the other gases.

"In my first attempts I could not recognize anything unusual, but as it often happens in experimental science the habit of observing the phenomena leads to being able to recognize signs under conditions where at first they passed unperceived. This is what occurred with hydrogen. In repeating only to-day, in the presence of MM. Berthelot, H. Sainte-Claire Deville, and Maseart, who have kindly authorized me to invoke their testimony, I have succeeded in observing indications of the liquefaction of hydrogen, in conditions of evidence which did not appear doubtful to any of the learned men who witnessed the experiment. This has been repeated a great number of times. In operating with pure hydrogen, submitted to a pressure of about 280 atmospheres and then suddenly released, we have observed the formation of an excessively fine and subtil fog suspended throughout the length of the tube and which disappeared suddenly. The appearance of this fog, notwithstanding its extreme subtility, has appeared incontestable to all the scientific men who have witnessed the experiment to-day, and they have taken care to repeat the experiment several times so as not to allow of any doubt as to its reality.

"*Air.*—Having liquefied oxygen and nitrogen, the liquefaction of air had been thus demonstrated; however

* This apparatus, which is described in the *Comptes Rendus* for November 5 last, is a hollow steel cylinder in which the gas is compressed by means of a hydraulic pump with the intervention of a layer of mercury.

it appeared to me to be interesting to make the direct experiment, and as might be expected, it has succeeded perfectly. It is unnecessary to say that the air had been previously dried and deprived of carbonic acid. Thus has been confirmed the exactitude of the views put forward by the founder of modern chemistry, M. Lavoisier, upon the possibility of making air assume the liquid state, producing matters endowed with new and unknown properties."

M. Pictet, although obtaining virtually the same results, worked in a somewhat different manner. The apparatus used is thus described by him (*Comptes Rendus*, Dec. 24, p. 1215):—"A and B (fig. 1) are two double-action suction and force pumps, coupled together on the 'compound' system, one creating a vacuum in the other in such a way as to obtain the widest possible difference between the pressures of suction and forcing. These pumps acts on anhydrous sulphurous acid contained in the cylindrical receiver, C. The pressure within this receiver is such that the sulphurous acid is evaporated at 65° below zero. The sulphurous acid is forced into a condenser, D, cooled by a current of cold water, where it liquefies at a temperature of 25° above zero, and at a pressure of about $2\frac{3}{4}$ atmospheres. As it liquefies the sulphurous acid returns to C, through a small tube, *d.* E and F are two pumps similar to A and B, and similarly coupled. They act on carbonic acid combined in a

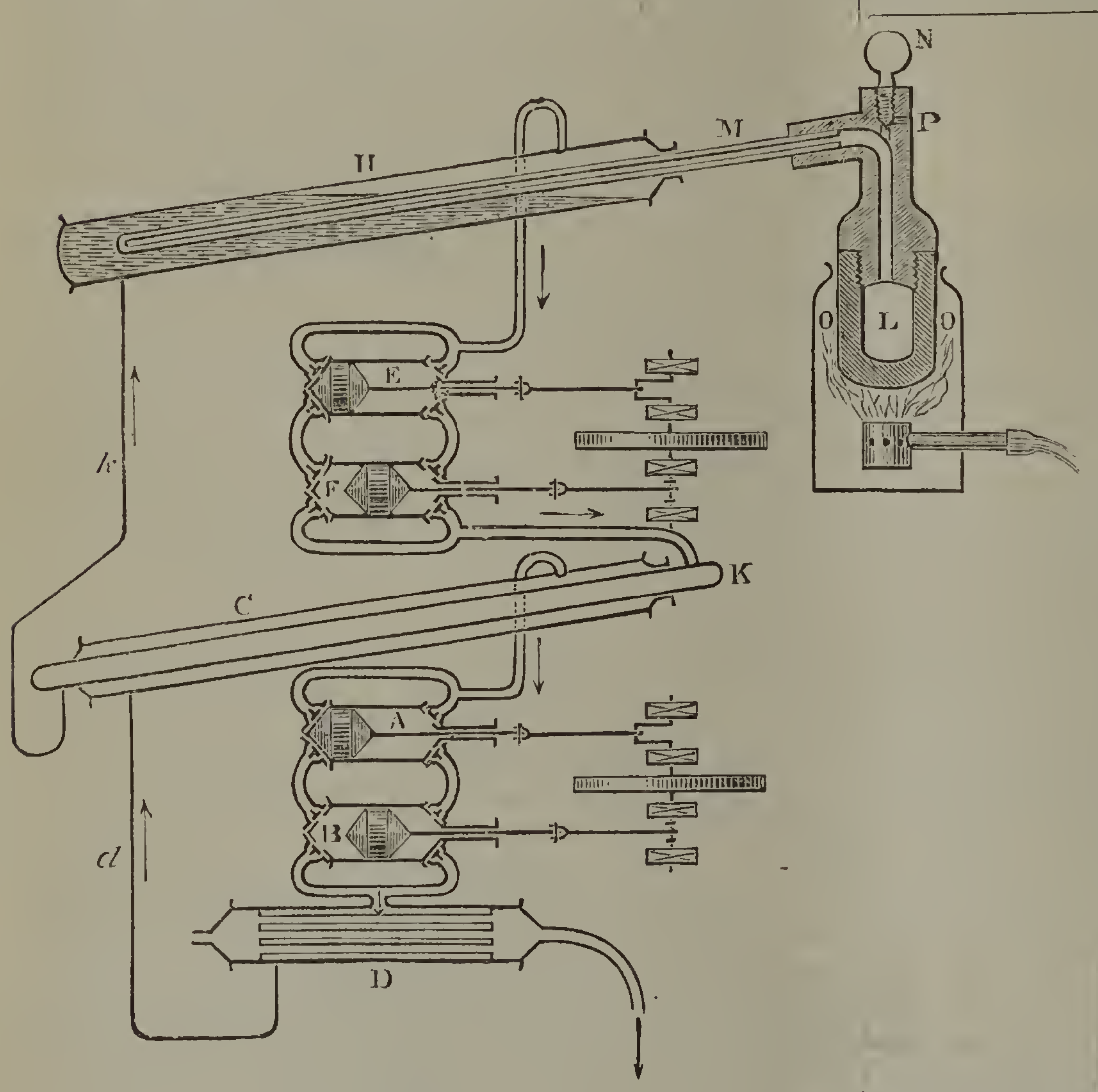


Fig. 1.

cylindrical receiver, H. The pressure in this receiver is such that the carbonic acid is evaporated in it at 140° below zero. The carbonic acid, driven back by the pumps, is forced into the condenser, K, inclosed in the sulphurous acid receiver, C, which is at 65° below zero: the carbonic acid is here liquefied at the pressure of 5 atmospheres. It returns gradually, as liquefied, through the small tube, K, to the receiver, H.

"L is a wrought-iron retort, sufficiently thick to resist a pressure of 500 atmospheres. It contains chlorate of potassium, and is heated so as to give off pure oxygen; it communicates by means of a tubulure with a slanting tube, M, made of very thick glass, one metre long, which is surrounded by the carbonic acid receiver, H, the temperature of which is 140° below zero. A tap, N, in the neck of the retort, allows of the opening of an orifice, P, which communicates with the air. After the pumps, worked by an engine of 15 horse power, have been kept in action for several hours, and when all the oxygen has been given off by the chlorate of potassium, the pressure in the glass tube is 320 atmospheres, and the temperature is 140° below zero. If the orifice, P, be now suddenly opened, the oxygen escapes with violence, producing an expansion and absorption of heat sufficient to cause a liquefied portion to appear in the glass tube and spirt from its orifice upon sloping the apparatus. It may be added that the quantity of liquefied oxygen contained in the tube, one metre in length, and 0·10 m. in internal diameter, occupied about two-thirds of its length and issued at the orifice, P, in the form of a liquid jet."

After the close of the same sitting, M. Dumas received a communication from M. Pictet, stating that the experiments had been successfully repeated and giving further details, from which the following is an abstract:—

"The object at which I have been aiming for three years past is to demonstrate experimentally that molecular cohesion is a general property of bodies without any exception. If the permanent gases cannot be liquefied it would be necessary to conclude that their constituent particles do not attract each other, and are thus exempt from this law. To succeed by experimental means in bringing the particles of a gas into the closest possible proximity, and thus accomplish its liquefaction, certain indispensable conditions have to be complied with, which I summarize as follows:—(1) To have an absolutely pure gas, free from any trace of a foreign gas; (2) to have at command very powerful means of compression; (3) to obtain an intense degree of cold, and the abstraction of heat at these low temperatures; (4) to have a large surface of condensation maintained at these low temperatures; (5) to be able to utilize the expansion of the gas under considerable pressure to the atmospheric pressure, which expansion, added to the preceding means, compels liquefaction. These five conditions being fulfilled, we may formulate the following problem:—When a gas is compressed at 500 or 600 atmospheres, and kept at a temperature of —100° or —140° and then allowed to expand to the pressure of the atmosphere, one of two things must happen. Either the gas, obeying the action of cohesion, becomes liquid, giving up its heat of condensation to the portion of the gas, which expands and is lost in the gaseous form; or, under the assumption that cohesion is not a general law, the gas passes beyond absolute zero, that is, becomes inert, a dust without consistence. The work of expansion would be impossible, and the loss of heat absolute.

"Impressed with the certainty that thermodynamic equations rest upon fixed numerical forms, I sought to contrive some mechanical means for realizing the conditions summarized above, and selected a complex apparatus that I may describe as follows:—

"I took two suction force pumps such as I use industrially in my ice-making apparatus. These I coupled so that the suction of the one corresponds to the compression of the other. The suction in the first communicates with a tube 1·10 m. long, filled with liquid sulphurous acid. Under the influence of a perfect vacuum the temperature of this liquid is rapidly lowered to —65° or even —73°, the extreme limit which has been obtained. Into this tube of sulphurous acid there passes a second smaller tube, measuring six centimetres in exterior diameter, and of the same length as the tube in which it is enclosed. These two tubes have a common bottom. In the central tube I compressed carbonic acid produced by the decomposition of Carrara marble with hydrochloric acid. This gas was dried, then collected under an oil-gas holder of one cubic metre capacity. With a pressure varying between four and six atmospheres carbonic acid is easily liquefied under these conditions. The fluid flows down by its own weight into a copper tube four metres in length and four centimetres in diameter.

"Two pumps, coupled in the same way as the first pair, volatilize the carbonic acid in the gasometer, and the long tube filled with the liquid acid. Admission to the pumps is regulated by a three-way tap; a screw-regulating tap intercepts, if desired, the entry of liquid carbonic acid into the long tube; it is placed between the carbonic acid condenser and this long tube. When the regulating tap is closed, and the two pumps suck up the vapour from the liquid carbonic acid contained in the four-metre tube, the lowest temperature is produced that can be got: the carbonic acid solidifies, its temperature falling to about —140°. The work of abstracting heat is kept up by the pumps, which have a joint cylinder capacity of three litres per stroke and make 100 strokes per minute. Both the sulphurous acid tube and the carbonic acid tube are enclosed in sawdust and baize to prevent radiation.

"Into the interior of the carbonic acid tube there passes a fourth tube, five metres in length, fourteen millimetres in external diameter and four millimetres in internal diameter, which serves as the oxygen compressor. This long tube is surrounded by solid carbonic acid, and the whole of its surface is brought to the lowest temperature that it is possible to obtain. These two long tubes are connected at the lower ends with the carbonic acid tube; consequently the small tube goes beyond the other by about one metre. This portion I bend towards the ground, giving both tubes a slightly inclined position, but still near enough to the horizontal as shown in the subjoined sketch. The small central tube is bent down

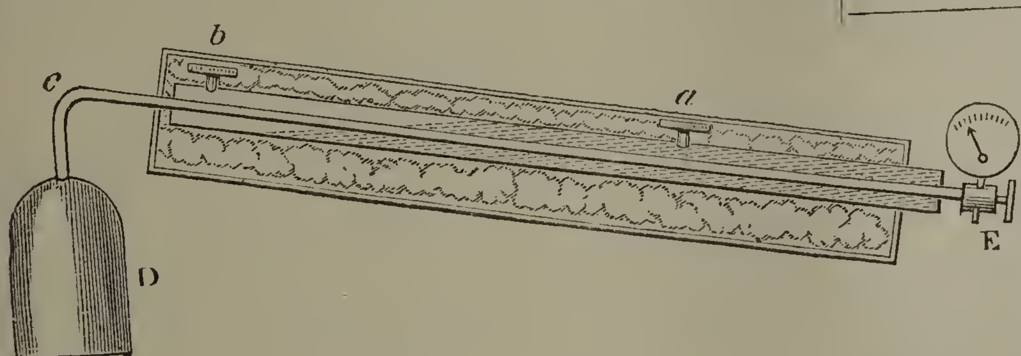


Fig. 2.

a. Opening for liquid carbonic acid.

b. Exit of vapours, corresponding with action of pumps.

at *c*, and screwed into the neck of a strong cylindro-conical retort, made of wrought iron, the walls of which are 35 millimetres thick. Its height is 28 centimetres, and diameter 17 centimetres. This retort contains 700 grammes of potassium chlorate and 256 grammes of potassium chloride mixed together, fused, pulverized and placed in the retort perfectly dry. I heat the retort when the double circulations of sulphurous acid and carbonic acid have lowered the temperature to the point desired. The chlorate of potassium is decomposed slowly at first, but tolerably rapidly at the end of the operation. A pressure-gauge at the end of the long tube enables me to watch the pressure and the progress of the reaction. It was made on purpose for me by Bourdon, of Paris, this last summer, and is graduated up to 800 atmospheres.

"When the reaction is finished the pressure exceeds 500 atmospheres; but it almost immediately falls, stopping at 320 atmospheres. If the screw-tap, E, at the end of the tube be opened at this moment, a jet of liquid may be distinctly seen escaping with extreme violence. If the tap be then closed a few seconds later, a second jet may be obtained, this time less abundant. Pieces of charcoal, slightly kindled, placed in this jet, ignite spontaneously with incredible violence. I have not yet been able to collect the liquid on account of the force with which it is projected; but I am now endeavouring to combine a cooled gauge, which may, by means of cloths, retain a little of the liquid.

"Yesterday (Monday, December 24th, 1877), I performed this experiment a second time before a good part of the members of our Physical Society, and we had three well-defined jets, one after the other. I cannot yet give the minimum pressure necessary, for it is evident that I must have had an exaggeration of the pressure produced by an accumulation of the gas in the retort, which resisted condensation in the narrow space represented by the inner tube.

"I intend using a similar apparatus to attempt the condensation of hydrogen and nitrogen, and I rely especially on my ability to maintain low temperatures with ease, by means of my four large pumps, worked by steam-power.

"I believe that it is in this direction particularly that it is necessary to work to effect the rebellious condensations, since the tension of saturated vapours is a direct function of the temperature. I am having a plan of my apparatus drawn up, and it will be my pleasure and duty to send it to you in the course of the week. I have learned with great interest that M. Cailletet has arrived at the same result with myself, and almost at the same moment. I have no idea as to what his process may be, but we shall doubtless enter into correspondence before long, and exchange our ideas on this interesting subject."

PATHOLOGICAL SOCIETY OF LONDON.*

Lactic Fermentation and its Bearings on Pathology.

BY JOSEPH LISTER, F.R.S.

A few years ago, it would have seemed very improbable that the souring of milk should have any bearings upon human pathology; but the large, influential, and highly interested audience that listened to Dr. Burdon Sanderson's lecture at the University of London yesterday was of itself sufficient evidence that the question of the essential nature of fermentative changes occupies a foremost place in the minds of pathologists at the present day.

In reading reports of discussions with regard to diseases presumably of such a nature, for example, the discussion that took place with regard to pyæmia in this Society some time ago, it has struck me that medical men were disposed to begin at the wrong end, so to speak, in this matter, to look at it from the clinical rather than from the physiological point of view.

It seemed to me that, in order that any sure steps should be taken with regard to the elucidation of the nature of presumably fermentative diseases in the human subject, the first thing should be that we should have clear ideas, distinct opinions, positive knowledge with regard to the more simple forms of fermentation, if I may so speak—more simple because they can be conducted and observed, investigated in our laboratories. It may be said, indeed, that such information has been already afforded to us by the researches of Pasteur and others who followed in his wake; and I must confess, Mr. President, that, for my own part, I should be much disposed to take such a view. But this opinion is by no means universal in our profession. We find men of very high position, both as physiologists and pathologists, expressing the view that, though in various fermentative changes, such, for example, as putrefaction, we do find organisms present, yet these organisms, these bacteria

* Address delivered Tuesday, December 18, 1877.

may, for aught we know, be mere accidental concomitants, not causes, of the fermentative changes. Some time ago I made an attempt in the special case of the lactic fermentation to decide this point one way or the other to the complete satisfaction of my own mind. So far as I am able to judge, I did succeed in this endeavour; and it occurred to me that it might not be without interest to the members of the Pathological Society to see with their own eyes the preparations, or samples of the preparations, which resulted from this inquiry, and on which my conclusions are based, before, from the lapse of time, they had lost their value. At the same time, I should not have presumed to bring this matter before the Pathological Society, if I were merely to bring forward what has been already sufficiently explained on a former occasion; but, while very briefly bringing forward those matters, I wish at the same time to place before the Society certain points that have not yet been published with regard to this particular fermentation.

First, I wish to make remarks regarding my method of experimentation, which, in its present simplified form, has never been published. The method of experimenting depends, in the first instance, upon the fact which experience has now amply demonstrated, that, if we have a pure glass—pure, that is to say, of anything living—such as this liqueur glass, have it covered over with a glass cap, and again this covered with a glass shade, such as I have here, and, for convenience, the apparatus reposing on a plate of glass; having this arrangement of pure glasses, if we have in such a glass any organic liquid, whatever it may be, so far at least as my experience has gone (and it has been considerable), if the liquid be pure from organisms in the glass, so long as this arrangement is maintained intact, no organisms will occur in the substance; or, in other words, although the atmosphere gains access to the interior of the glass—for the glass cap does not fit at all, the glass shade is not designed to fit, but may happen to project beyond the glass plate so as to leave a distinct palpable gap—it does not affect the result, but the double protection of the glass cap and the glass shade, while not excluding the gases of the atmosphere, excludes effectually the atmospheric dust, and, if the dust be excluded, organisms are prevented from occurring.

The glasses are obtained pure by means of heat. I find that exposure to a temperature of about 300° Fahr. for two hours is sufficient, so far as my experience is concerned, to destroy the life of all living material. But it is not enough that the glasses should be heated; it is necessary that the air that enters them during cooling should be filtered of dust. This I provide for by heating a cast iron box, the door of which I have brought; the box itself is too cumbersome to bring. This door has its circumference in the form of a considerable groove capable of being packed with a mass of cotton-wool. This door can be screwed up by nuts against the edge of the box, so that the edge of the box becomes firmly pressed against the cotton-wool. The cotton-wool then will serve as an effectual filter of the air that passes in during cooling; but then it is essential that the box should be so arranged that it may be equably heated. This cotton-wool has been used for several experiments, and you see it is only slightly browned; it is not singed. This is provided for by having the box heated by a large Bunsen's burner; between the Bunsen's burner and the bottom of the box are three shelves to prevent the heat from acting directly on the bottom of the box; at the same time, the box is covered over with a cover which confines the heat and compels the heated air to pass round the box and escape at the top of the cover. By these two means combined, the shelves below and the cover round about, we get the result which you see indicated here. The cotton at the top of the box is just in the same degree browned as the cotton at the bottom. Into such a box we may put a dozen glasses like these. We have a thermometer packed with cotton-wool in an aperture in the top of the box, to let us know when the temperature of 300° has been attained. When this temperature has been continued for two hours, the Bunsen's burner is extinguished, cooling is allowed to take place; and, when the apparatus is perfectly cooled, then the glasses are removed, and we are sure that they are taken out perfectly free from living organisms.

In the next place, how shall the organic liquid be introduced pure into such a glass? In my last publication on this subject, an exceedingly complicated method of decantation was described, enough, I confess, to deter anyone from repeating similar experiments. I am happy to say that we now manage the thing in a comparatively simple manner. The means of decanting is a flask of this form, having a bent spout large at the commencement and comparatively narrow in its shorter terminal part. The result of this arrangement is that, when a liquid is poured from such a flask, and then after the pouring the flask is returned to the erect position, the end of the nozzle is always valved by a drop of liquid. The large size of the first part of the spout prevents it from acting like a syphon. There is always a guarding drop at the orifice; regurgitation of air never can take place through the nozzle. The mouth of the flask has been previously covered with cotton-wool; and any air that enters the flask during the pouring out of the liquid passes through the cotton, and is filtered of its dust by so doing. As I have already explained, the guarding drop at the end prevents the regurgitation of any air through the orifice of the nozzle. When the decantation is complete, a piece of rag dipped in carbolic acid lotion is applied to the orifice, and by that means, by capillary attraction, the drop is sucked out, and a piece of pure carbolized cotton-wool is then applied. A convenient mode of carbolizing is to treat the cotton-wool with a solution of one part of carbolic acid and one hundred parts of anhydrous ether. The ether flies off and leaves the carbolic acid behind in a highly pungent and antiseptic condition. The nozzle having been deprived of its drop, the carbolized cotton cap is tied—and here is a little projection on the spout to secure the tying—and then the liquid, provided it is pure to begin with and the flask is pure, will remain ready to hand a week, or even a month or a year hence, according to your convenience.

Now, as to the protection of the liqueur-glass that is to be charged. Suppose I were going to charge this glass, say from this vessel—a flask of the same kind charged with Pasteur's solution on the 7th of August of the present year, which, you observe, remains as pure and as clear as when it was first prepared, although from it have been charged various liqueur glasses—I should remove the cotton-cap from the nozzle, and the instant that was done should slip the end of the nozzle into the opening which exists in this half of an India-rubber ball which had been previously steeped in a solution of carbolic acid and water. The India-rubber absorbs into its consistence carbolic acid, so that, even though dry after such steeping, it is powerfully antiseptic. The moment the cotton-cap is removed, this cap of caoutchouc is applied with its concavity downwards, and then I proceed to decant. I take off the glass cap, and instantly substitute the cap of India-rubber; the flexible India-rubber acting as a hinge. Fluid is poured in, while the antiseptic cap securely excludes any living organisms; and then, the instant the process is complete, the glass cap is replaced and the shade put on. The hemispherical form of the cap prevents lateral currents of air from depositing dust on the end of the nozzle of the flask, and a second glass, a third glasss, or a dozen glasses may be so charged; and experience shows that by this mode of procedure such a dozen glasses, provided the flask has been pure and the liquid pure in it, will remain with their contents unaltered till they dry up through atmospheric influence.

The last point is, how do we get the flask in a pure state with a pure liquid in it? The flask is purified with its caps of cotton over the mouth and nozzle by being put into the hot box. That is so far simple; we have, therefore, a pure flask to begin with.

Next, we wish to introduce into it a pure liquid. There is one liquid which we may very easily get in the pure state with very little trouble indeed, and that is unboiled urine, provided we have a healthy urethra to deal with and a healthy bladder. All we have to do is to apply the 1 to 40 carbolic acid solution to the glans penis and the meatus urinarius of the patient; then, taking off the cotton-cap, apply to the orifice the glans penis. The glans penis takes the place of the caoutchouc cap, and urine passes in, no regurgitation of air being possible. As soon as the act of micturition is over, a carbolized cotton-cap is tied over, and as surely as you do that will you have the unboiled urine, with its vesical mucus (which used to be regarded as the special ferment of urine) remaining for any length of time perfectly unaltered, without any bacteric development whatever.

But, suppose we have to deal with a liquid like milk, where we cannot have it pure to start with, we must purify it by heat. I do not know what I may find in this densely populated metropolis; but in the comparatively pure metropolis which I have lately inhabited, Edinburgh, I have never yet found any organism which resisted the temperature of 210° continued for half an hour; I mean to say in the moist state. I have found no organisms in a liquid continue fertile after exposure to 210° Fahr. for half an hour. I say 210°, and not 212°, which is boiling point, because the way in which we have proceeded is, after introducing the liquid into the flask, to immerse the flask in boiling water, and, in consequence of a certain degree of evaporation which takes place through the cotton, the temperature in the flask is prevented from ever rising fully to the boiling point. You do not have ebullition take place, and that is a great convenience, as we have no frothing; but you have a temperature somewhat short of 212°; we may say 210°. All we have to do then, having got the flask pure, is to introduce the liquid into the lower part of the flask, with a view to immersion in a saucepan of boiling water; but there must be the most scrupulous care taken that the liquid so introduced shall not come into contact with the upper parts of the interior of the flask; for, if they do, they will fail to be acted on by the full heat of the water in the saucepan. Now, the mode in which I filled my flasks in my first experiment of this kind was, having provided myself with a rag dipped in carbolic acid lotion, I took a long funnel and purified the exterior of the funnel with carbolic acid lotion, which answers just as well (1 to 20 lotion) as exposing it to the gas-flame or the spirit-lamp. I then passed the funnel down through the rag, which I had previously wrapped round it; then poured in the liquid, then withdrew the funnel, taking scrupulous care that the drop at the end of the funnel does not touch the sides of the flask; then substituted a carbolized cotton-cap, and immersed the flask in the saucepan. If I proceeded in this way with Pasteur's solution, with turnip-infusion, with simple water, with other materials I need not describe, I always had success; but, when I did the same thing with milk, time after time, to my great disappointment, I failed altogether. What was the explanation of the failure? Some persons might have said: "Oh! the explanation is very easy to find. There are in the milk complex molecules ready to develop, though as yet chemical substances, into living beings, and, because of the complex constitution of the milk, therefore it is that you fail; whereas your Pasteur's solution is a comparatively simple material, and your turnip-infusion, compared with milk, is simple." I felt sure that that was not the explanation, but that there must be some defect in my method of procedure. It may perhaps have occurred to some of you what that defect was; it was simply that, if we pour in any liquid through a funnel, we invariably have air passing with it. Air-bubbles appear upon the surface of the liquid, and those bubbles bursting carry with them their dust, and it may be that that dust may be deposited upon the upper part of the interior of the flask. But why should you be more likely to succeed with Pasteur's solution than with milk? Simply for this reason: that milk is a material which serves as a pabulum for almost all organisms. I once met with a bacterium, and only once, that would not live in milk; for it appears that almost all varieties of bacteria (which appear to be excessively numerous) will live in milk, whereas it is only a comparatively small proportion of bacteria that, if put alive into Pasteur's solution, will live in it at all. How, then, was the difficulty to be overcome? Of course, when we saw what the difficulty was, there was no great difficulty in overcoming it. It was done by substituting a syphon for the funnel. Here is the syphon that I used, consisting partly of two glass tubes, partly of India-rubber, with a stopcock in the course of the India rubber. This syphon is charged with water, the temperature of which should be higher than that of the air, so that there will be no dissolved air given off to form air-bubbles. Then suppose this is the fluid you wish to introduce into the flask. We pass one leg of the syphon into it, then turn the tap and permit a sufficient amount of fluid to flow out for all the existing water to escape from the syphon, and then we proceed just as with the funnel. Carbolized rag is wrapped round the end of the syphon; and, just as the cotton-cap is removed from the pure flask, a carbolized rag is put on; the syphon is slipped down, the tap is turned, and the liquid is introduced without the introduction of the smallest bubble of air. When a sufficient quantity of the liquid has been so passed in, the tap is turned, and then the syphon is withdrawn, scrupulous care being taken that it does not touch the inside of the flask; then a carbolized cap is instantaneously substituted for the carbolized rag, and the charging is completed.

Now, I have said that, before I saw my mistake as regards the use of the funnel, I never succeeded with milk. Since I have adopted this method, I have charged many flasks, and never failed. Here is a flask of boiled milk, that is to say, exposed to a temperature of 210°, on the 7th of August, and here it remains, I venture to say, as pure as it was immediately after the exposure to the heat. Now, I venture to say that this failure and correction of the failure are instructive, as showing how the development of organisms, under circumstances in which we wish that they shall not develop, is liable to be explained by fault on our part, defect in our own manipulation.

Having said so much with regard to our method, I will proceed as quickly as I can with the facts that I wish to bring before the Society. I selected the lactic fermentation as one peculiarly favourable for the purpose of investigation: first, because the lactic fermentation is a very remarkable change in milk, a very conspicuous fermentation in its results, conspicuous in the solidification that ensues, conspicuous in the marked souring that takes place; and, in the second place, because the ferment which causes the lactic fermentation is a rare ferment, speaking of the world generally, and, if it be a rare ferment, it is not likely that any accidental defect in the manipulation will lead to its introduction. I say it is a rare ferment; in dairies it seems to be universal, but in the world in general it is rare. If you charge a series of glasses like this with boiled milk, and take off their caps, exposing them to the air for half-an-hour at different times in the day, or exposing them in different rooms, say for half-an-hour, so far as my experience goes, you will be certain to have fermentative changes result, you will be certain to have organisms produced; but, so far as my experience goes, you will be certain not to have the lactic fermentation take place, you will be certain not to have the coagulation and the souring, and you will not find the peculiar organism to which I have given the name Bacterium Lactis, which I have represented here as it occurs in curdled milk, and which, as I left one of those microscopes, was to be seen in souring milk of yesterday.

This bacterium is a motionless bacterium, occurring most commonly in pairs, frequently in threes, fours, or even more. You always find these, as far as I know, in souring milk; but you will not find them under the circumstances to which I have alluded as the result of mere exposure to the air. The glasses I have brought before you here illustrate the same point as regards unboiled milk; these little glasses have been repurified in the hot-box in the way described, each one bring fitted with a little test-tube cap. The milk was received from the cow into a pure glass, purified by heat, within about two yards of a dairy—in a little orchard beside a dairy—and from the pure vessel it was transferred with a syringe and a purified pipette into the several glasses. Here we had unboiled milk to deal with. Every one of these twenty-four glasses has undergone fermentative changes, and, though I have not yet had the opportunity of examining them microscopically, I have not the least doubt that they all contain organisms, because, in a former experiment, performed in the same sort of way with half the number of glasses, I saw similar appearances to a considerable extent to those which are the only doubtful ones, and I found on examination that those appearances did depend on organisms. I say the only doubtful ones, because there are some here with regard to which inspection with a pocket-lens is quite sufficient to show that organisms are present. No fewer than seven of these twenty-four glasses have filamentous fungi in them; apparently — I have not yet examined them microscopically—of five different species. In spite of the care which I then took, organisms entered into all those glasses, but in not one of them did the lactic fermentation take place; all had fermentations of other kinds. Some of these milks, if members of the Society will examine them, will be seen to be exceedingly peculiar, indeed beautiful; there are scarlet or almost vermilion coloured spots, for example, here; some have a golden-yellow aspect, less seen by this light than by daylight. Numbers of different organisms have developed here, but not a bacterium lactis, or at all events nothing that caused the lactic fermentation.

Here, again, I have a set of glasses with which the same experiment was performed, only still more carefully. In this case, the experiment was more rigorously conducted, and here, in the majority of the glasses, at first sight you will suppose that no change at all had occurred; and in two of them I found, at the end of six weeks, that there was no indication whatever of any organisms. I tapped one of them and found the milk still perfectly fluid, of normal taste and reaction and without any organisms in it; showing that unboiled milk, as coming from the healthy cow, really has no ferment in it capable of leading to lactic fermentation, or any other fermentation, or to any organic development whatever.

The same scarcity of the lactic ferment is found in water as in air. If I prepare a series of glasses of boiled milk, and add water to them, say from an ordinary tap, a corresponding result is obtained. A very instructive mode of performing the experiment is to add very small drops of water by means of a syringe having a graduated nut, revolving on a fine screw on the piston-rod so that you are able to have exactly one hundredth of a minim—each degree on the nut corresponds to one hundredth—expelled at your pleasure. If I take water from the tap, and introduce one hundredth of a minim into, say ten glasses of boiled milk, which I do by simply taking off the cap and applying the hundredth to the surface, and applying the cap without loss of time, the result is that you get in some of the glasses certainly fermentative changes and organisms, but you do not get the lactic fermentation. And what is extremely interesting is, that you get different fermentations in different glasses, and some glasses escape altogether. That proves at once this important truth, that the fermentative agency in water, the existence of which was pointed out by one of the members of this Society, Dr. Burdon Sanderson, long ago, is not in the form of any matter dissolved in the water, but in the form of suspended particles of some kind or other; for, if it were dissolved in the water, every equal-sized drop would produce an equal effect. But some glasses escape altogether, and those which are affected are affected with different kinds of fermentation.

If the cream happen to be thick, you will see just at the spot of inoculation in course of time the first appearance of alteration when the bacterium happens to be a motionless bacterium, indicated, perhaps, by some curious colour—a vermilion tint, in one instance—spreading gradually over the cream, the vermilion part shown by the microscope to teem with bacteria, the uncoloured part free from bacteria, and so forth. But various as the fermentations were, there was no instance of the lactic fermentation, *i.e.*, curdling and souring of the milk. Therefore, you see, Mr. President, from these facts, that the souring of milk instead of being what one might suppose *à priori*, perhaps, from seeing it constantly occur in course of time in all milk brought from a dairy—instead of supposing it to be something inherent in the nature of the milk—is something which, whether in boiled milk or in unboiled, requires the introduction of something from without, and that something a scarce article, both in air and in water, except in dairies. I may say that, even in a dairy, I once exposed a glass of boiled milk by taking off the glass shade and glass cap for a quarter-of-an-hour, thinking very likely I should find the lactic fermentation as the result, as I should have had if I had introduced the smallest quantity of milk from any one of the pans. It so happened that I did not get the lactic fermentation even there; I got a filamentous fungus, and I got a bacterium also, but a bacterium associated with a most extraordinary alteration—a degree of viscidity that I dare say was never seen before—a viscidity that reminded one of the drops that bead the spider's web. By introducing a mere needle into the top of the liquid, I could draw it up a yard and two inches before the barely visible thread broke. That was the special fermentation that resulted from exposure on that occasion, even in the dairy; it so happened that no particles of the lactic ferment had been floating in the air so as to fall into that glass.

Well, then, this particular fermentation, from the conspicuousness of its effects and the rarity of the ferment, seemed a particularly favourable one for investigation.

(To be continued.)

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Friday evening, January 4th, when a paper by Mr. Shapley, on "Blood Chemically and Microscopically considered," was read by the Secretary.

After a short review of the work done by the principal investigators of this substance, the author proceeded, with the assistance of a table, to enumerate the compounds contained in blood, and state the percentage of each, the more important, including fibrin, albumin and colouring matter, receiving special attention. Coagulation was explained and the theories which have been advanced as reasons for coagulation were entered into, the one most probably correct being that of Schmidt, which depends upon the formation of fibrin from fibrinogenous and fibrinoplastic elements after the removal of the blood from the body. Corpuscles, their shape, size, and microscopical appearance, were next described, and the paper was concluded by illustrations of the absorption spectra of freshly drawn arterial and venous blood, and of hæmatin.

The paper was followed by a considerable discussion, and after passing a unanimous vote of thanks to Mr. Shapley, the meeting adjourned.

Parliamentary and Law Proceedings.

Death from Chloral.

On December 21st, Dr. Diplock held an adjourned inquiry at South Kensington, touching the death of Mrs. Amelia Cleverly, a widow, 70 years of age. From the evidence given on the former occasion, it appeared that the deceased was found dead in bed on the morning of the 23rd ult. A bottle that had contained syrup of chloral was found in her room. A *post-mortem* was made, and the medical evidence showed that deceased had swallowed sufficient chloral to kill four persons. Mr. John Mark Brock, assistant to Mr. G. Hardy, chemist, 10, Fulham Road, Brompton, was sworn, and stated that deceased, accompanied by a woman, came to the shop on the evening of the 22nd ult., and was served with sixpennyworth (an ounce) of chloral syrup, which contained 80 grains of chloral. The deceased said she had been in the habit of taking chloral, and after being served she was instructed as to the quantity to take. In reply to a juryman, the witness said the label on the bottle was not marked "Poison," as it was not necessary. The jury returned a verdict "That deceased died from accidentally swallowing an overdose of syrup of chloral."

Thr Charge of Adulterating Beer with Salt.

On Dec. 31st, James Scott, landlord of the Wellington beerhouse, Bromley, appeared before Mr. De Rutzen at the Thames Police Court, to answer an adjourned summons taken out at the instance of the Metropolitan Board of Works for the Poplar district for selling beer adulterated to the extent of 63 grains of salt to the gallon. The case was reported before and adjourned for judgment.

Mr. De Rutzen now said one thing was clear, namely, that the defendant did not adulterate this beer by putting salt into it, because the evidence of the foreman of Messrs. Truman, Hanbury and Buxton, the brewers who supplied the beer, and scientific witnesses, was to the effect that if the public analyst had been a little more careful he would have found a greater portion of salt in the beer than he did. They further said that the salt found was only the natural product of the malt, hops, and saccharine matter which they use in brewing, and that they put no salt in the beer. The delivery note given by the brewers to the defendant amounted to a warranty that the article supplied was of the same substance, quality, and nature as that ordered, and it appeared that the defendant sold it in the same state. The defendant, therefore, came within the 25th section of the Food and Drugs Act, and the summons would be dismissed, but as he did not give notice of the defence he was going to set up he would have to pay £10 costs.

Attempted Poisoning by Sugar of Lead.

On January 2nd, Alfred Bellchambers was charged at Woolwich with attempting to poison his wife. Mr. Robertson, surgeon, said that he was called by the prisoner to attend his wife, and told her that she had been taking lead poison, when she replied in the prisoner's presence that she had taken sugar of lead accidentally by putting it into her tea in mistake for carbonate of soda. The prisoner confirmed this statement, and when witness saw the woman again next day, and remarked that the poisoning must have been going on for some time from the quantity of lead in her gums, they both said that it had been going on for a long while. On Monday, having received a hint, witness spoke plainly to Mrs. Bellchambers, when she made a statement which induced him to inform the police. Some sugar of lead and a mixture of tea were produced by the witness. In cross-examination by Mr. Whale, on behalf of the prisoner, Mr. Robertson said that sugar of lead could not well be mistaken for carbonate of soda, being heavier and of a bluish colour. He had not heard that the prisoner's wife had used it for a lotion. Mr. Balguy remanded the prisoner, and refused to accept bail.

Poisoning by Potassium Cyanide.

On January 2nd, Mr. John Humphreys held an inquest at the Hope Tavern, St. Luke's, on the body of Frederick Bailey, aged 45, a hairdresser. On Monday the deceased suddenly left the room, at the rear of his shop, and went to a show-case in the shop, and drank a quantity of cyanide of potassium used in his business for the purpose of hair dyeing, returning to the parlour with the empty glass. For some past he had given way to intemperate habits. Death ensued shortly afterwards. The jury returned a verdict of Suicide whilst in an unsound state of mind.

Poisoning by Sulphuric Acid.

On January 2nd, Mr. Humphreys held an inquest at Bethnal Green, touching the death of Emma Cox, a single woman aged 24. It appeared that on Sunday last, the deceased and a younger sister had an altercation, and the father reprimanded both the girls. The deceased left the table, and in a few minutes afterwards she was found vomiting in her bedroom. A surgeon who was fetched found that the deceased had taken nearly three ounces of sulphuric acid. She died a few hours afterwards from the effects of the poison. Verdict, Suicide whilst in an unsound state of mind.

Dispensing Memoranda.

[50]. Extract. Ergotæ Liq.—Will you kindly allow me to make some observations concerning dispensing memorandum No. 50? The answer of Mr. A. W. Gerard to No. 50, extr. ergotæ liquidum, induced me to repeat the test, and having no more sediment at my disposition I evaporated some of the liquid extract and reduced the organic matter to coal. I washed the remnant repeatedly with hot distilled water, acidulated the collected liquids with hydrochloric acid, and ascertained the presence of potash with bichloride of platinum. Chloride of barium produced a white precipitate in the liquid, which is partly soluble in nitric acid, and gives with molybdate of ammonia a yellow precipitate, consisting of molybdic acid, ammonia, and phosphoric acid. The undissolved part of the white precipitate melted with carbonate of potash, dissolved in hot distilled water, and filtered, gives with chloride of barium a white precipitate = sulphuric acid; so much for the presence of phosphate and sulphate of potash. The sulphate not being so easily soluble in water as the phosphate, I must conclude that the crystals found by "Young Pharmacist" consist of sulphate of potash.

H. W. Langbeck.

[52]. A short time since I had the following prescription to dispense:—

℞ Ext. Hyoscyami . . . . gr. iij.
Pil. Rhei Co. . . . . gr. iv.
Ft. pil. cap. j. h. s. s. Mitte xij.

Will some of the readers of the Journal kindly inform me whether they would have sent out 7 grain pills or divided the mass into 24, and directed two for a dose?

Henry Cumber.

[53]. Can you inform me if the following can be dispensed so as to form an "inseparable mixture," as I have been told it has been by a first-class London house?—

℞ Ol. Amygd. Dulc.
Liq. Ammoniæ, P.L. . . . . . āā ℥j.
Spt. Rosmarini, P.L. . . . . . ℥vj.
Ol. Ess. Limon. . . . . ℥j.
M. Ft. lotio.

H. B. Sainsbury.

[54]. Could anyone suggest a method of making a suitable pill of the following—not a bolus:—

℞ Kreosot. . . . . ♏ ii.
Pil. Rhei Comp. . . . . grs. ii.
M. Ft. pil.

Aderyn.

[55]. Kindly inform me how to make a clear solution of the following:—

℞. Pot. Chlor. . . . . ʒi.
Acid. Salicylic. . . . . ʒss.
Sp. Juniper. . . . . ℥vi.
Aq. Camph. . . . . ad ℥viii.
M. Ft. mist.

AN APPRENTICE.

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[56]. I shall be glad if any of your readers will inform me how they would dispense the enclosed prescription:—

℞. Phosphori . . . . gr. i.
Micæ Panis. . . . . ʒi.
Aq. . . . . q. s.
Ft. pil. xx. j. bis die. s. d.

C. E. S.

Notes and Queries.

[569]. OIL OF STAVESACRE may be utilized for external application by working it up after the manner of unguentum simplex, substituting oil of stavesacre for almond oil.—G. HERBERT.

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[571]. BLUE COLOUR.—Solution of sulphate of copper mixed with an excess of solution of ammonia until the first formed precipitate is dissolved and diluted with distilled water gives a fine blue colour that will not form a deposit.—H. W. LANGBECK.

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[573]. SILVERING LIQUID.—C. H. A. will find the following very useful:—

Take—
Chloride of Silver . . . . 3 parts.
Cream of Tartar, in fine powder . . 20 ,,
Common Salt, in fine powder . . . 15 ,,

Mix and rub with a little water into a thin paste, then spread with a soft paint brush over the cleansed metal, and when dried, polish with precipitated carbonate of lime. I have silvered in this way spoons, forks, scales, and even copper vessels used in the preparation of syrups containing acids.—H. W. LANGBECK.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE DEATH POINT OF BACTERIA.

Sir,—In my paper on "Putrescible Liquids," communicated to the Pharmaceutical Conference in the autumn of 1877, I stated that bacteria and their germs were utterly destroyed when placed in a temperature of 150° Fah. and upwards, providing the heat were continuously applied for a period of from three to six days. This was quite a new point in the inquiry, inasmuch as all previous experimenters had sterilized their infusions by actual boiling, the periods varying from five minutes to as many hours. It affords me much gratification to find my statement now corroborated by no less an authority than Professor Tyndall himself. In a long and able article on "Spontaneous Generation," published in the *Nineteenth Century* for the present month, the Professor says:—"An infusion which will resist five hours' continuous exposure to the boiling temperature will succumb to five days' exposure to a temperature 50° below that of boiling." This is precisely my own experiment re-stated. Be it observed that not until now (three months after the date of my paper) has the Professor advanced so far, his previous method consisting of "discontinuous heating," or boiling at intervals. In my own plan no tedious boilings or elaborate protecting media are required. Liability to error ceases and certainty of result ensues. Working in an atmosphere of 120° and above, with my sterilized infusions in open vessels and freely exposed to the air, I could get no results whatever, simply because heat being a true germicide no living matter could exist within its range. Am I too sanguine in anticipating that ere long simple heat will vie with, if not supersede, those elaborate antiseptic dressings which are fast becoming the *sine quâ non* of successful surgical practice?

I need scarcely say, however, that there is still much to learn on this subject. The theory of "softening," as applied to these supposed desiccated germs, I believe to be erroneous, except so far as the softening may be co-existent with their partial or actual development. Again, the fact that a properly prepared saline solution will nourish and sustain bacteria and yet be without vivifying action on bacteria germs is suggestive of much that has yet to be worked out and explained. Nevertheless, the results obtained in the practical application of the germ theory by means of antiseptics are (so far as they can be fairly observed) sufficiently clear and conclusive.

I have only to add that the infusions of hay, cucumber, beef, etc., prepared some months since without boiling, as above intimated, are still quite clear and pellucid and free from all signs of infusorial life.

King's College Hospital. W. WILLMOTT.

G. S.—(1) *Trifolium arvense*; (2) *Calamintha officinalis*; (3) *Bryonia dioica*; (4) *Carpinus Betula*; (5) *Gnaphalium uliginosum*.

J. B. C.—Respecting the subject of your question we have received a letter from the Board of Inland Revenue stating that the Acts relating to the Stamp Duty on Medicines do not extend to Ireland, but that medicines exported from Great Britain for sale in Ireland or elsewhere require to be stamped before exportation.

J. G. Prebble.—See *Pharm. Journ.* for July 15, 1876, p. 42.

W. P. Harrison is recommended to submit the powder to an analytical chemist for examination.

A. Davis.—The regulations respecting dispensing in the Naval Hospitals will be found in the Pharmaceutical Society's Calendar and in the present series of this Journal, vol. iii., p. 364. There is no similar appointment in the army to be obtained without enlisting.

S. V. Holgate.—We should think the whole of the preparations would be liable for the reason named and because they are recommended for the relief of human ailments.

W. J. W.—Apply at Apothecaries' Hall.

M. Hanley.—The form for making the preparation has not been published.

Vaseline.—There are now several preparations of the nature indicated in the market.

B. N. S.—The only really valuable book on the subject in the English language is Wilson's 'Bryologia Britannica,' which is now out of print and very scarce. A new edition of it will probably be issued this year. Stark's 'History of British Mosses' is a small work, very useful for details of structure but useless as regards classification.

Poison Bottles.—With respect to the communication from Mr. Robertson, of Elgin, in last week's Journal upon this subject, we are informed that Messrs. Kilner Bros., of Thornhill Lees, near Dewsbury, have for some past supplied bottles in blue glass, with two sides ribbed, and the words "Not to be taken" on a plain side. It has not been found practicable to make the letters different in colour to the bottle.

The "London Glass Bottle Company" remark that blue fluted poison bottles are made, but not greatly used, owing to their extra cost, and express an opinion that if their use for poisons were made compulsory there would be fewer accidental poisonings.

The "Barnsbury Glass Company" are of opinion that ruby and myrtle green glass, indicating danger and caution, might be substituted for blue glass in poison bottles, and state that this would not add to the cost of production.

COMMUNICATIONS, LETTERS, etc., have been received from Professor Dragendorff, Mr. Langbeck, Dr. Schacht, Mr. Fairlie, Mr. Urwick, Mr. Morris, Mr. Slatter, Mr. Bate, Mr. Baldock, B. H., W. G. F., Aderyn.

LOBELIA INFLATA: ITS PROXIMATE PRINCIPLES.

BY WILLIAM H. D. LEWIS, PH.C.

Lobelina, the active principle of *Lobelia inflata*, was first isolated by Proctor* in 1836, and subsequently by Bastick in 1851. The former, who in 1841 studied the drug more particularly, dissolved out an impure acetate in alcohol, triturated it with magnesia, and removed the alkaloid by agitating with ether, which was allowed to evaporate spontaneously. By dissolving the *lobelina* thus obtained in water and dilute sulphuric acid, boiling with purified animal charcoal, and removing as before by the use of magnesia and ether, it was deprived, to a certain extent, of colouring matter.

Bastick† adopted for the separation of the active principle a process similar to that recommended by Liebig for obtaining hyoscyamia. It differed from Proctor's method only in the use of sulphuric acid instead of acetic, and of lime and carbonate of potash in the place of magnesia as a means of removal from the acid. The alkaloid was freed from colouring matter by dissolving in alcohol, agitating the solution with purified animal charcoal until decolorized, filtering, and evaporating until the residue no longer lost weight.

Richardson's‡ process consists in dissolving the precipitate obtained by the addition of potassio-mercuric-iodide to an infusion of the drug, in ammonia, and, after removing the mercury with hydric sulphide, the iodine with nitrate of silver, and the excess of silver with hydric sulphide, concentrating the solution, and allowing the nitrate of lobelina to crystallize out. No directions are given for separating the alkaloid from this salt, but in the present experiments it was accomplished by dissolving in a small quantity of water, and triturating for several hours with an excess of calcined magnesia. The lobelina was then extracted from the solution by agitating with successive portions of amylic alcohol and allowing the latter to evaporate spontaneously. Lobelina may also be prepared from the cold infusion of the drug by precipitating with phosphomolybdic acid, collecting the precipitate on a filter and washing thoroughly with cold water; then, suspending in water and, after triturating for some time with carbonate of barium, extracting with alcohol, ether or amylic alcohol. In all of these methods there is difficulty in separating the alkaloid from colouring matter. By the following process the lobelina was obtained in a much purer state than by any of the methods above described.

The powdered drug is mixed with purified animal charcoal, and, after moistening with water to which a small quantity of acetic acid has previously been added, it is packed firmly in a percolator and allowed to macerate for several days. More of the menstruum is then poured on and the percolation continued as long as the percolate possesses any bitterness. The solution is then gently evaporated to the consistency of an extract, triturated with an excess of calcined magnesia, and the filtered liquid agitated with amylic alcohol, which is decanted and allowed to evaporate spontaneously. The lobelina may be further purified by dissolving in water, and filtering through animal charcoal. In this case the alkaloid is retained in the charcoal, from which it may be removed by ether or by amylic alcohol. Sulphuric acid may be used in the place of acetic, but, as the latter forms a salt more soluble in water than any other, it is to be preferred.

Lobelina, as obtained by either of these methods, is of a light yellow colour and the consistency of honey. It has a strong alkaline reaction and forms crystallizable salts with acids (not acetic), but is itself uncrystallizable, in this respect differing from hyoscyamia.

Caustic alkalies decompose it readily, hence it cannot be prepared from the plant by the ordinary methods of obtaining the non-volatile alkaloids; neither can it be separated by distillation, as conia or nicotina. It has a somewhat aromatic odour, and a sharp acrid taste. It is lighter than water but dissolves in it to a yellow colour. It is also soluble in alcohol, chloroform, ether, benzol, petroleum, naphtha, amylic alcohol, bisulphide of carbon, and many fixed and volatile oils. Petroleum naphtha dissolves it sparingly, and amylic alcohol freely from acid solution. The fixed and volatile alkalies with water dissolve it with more or less decomposition.

Nitric and hydrochloric acids dissolve it to a yellow colour. Sulphuric acid decomposes it with the formation of a red brown colour, which is intensified on the addition of a fragment of bichromate of potassium. Fröhde's reagent reacts the same as sulphuric acid. On exposure to the air lobelina slowly resinifies. In aqueous solution it is precipitated red brown by iodine in solution of potassic iodide, and white by tannic acid, the latter precipitate being soluble in ammonia and in excess of the precipitant. Potassio-mercuric-iodide gives a pale yellow precipitate, slightly soluble in excess, and nitrate of silver a white precipitate, soluble in ammonia and nitric acid. Chloride of gold produces a pale yellow precipitate, insoluble in hydrochloric acid. Acetate of lead throws down a white acicular precipitate. Chloride of platinum gives a yellow precipitate, which swims on the surface of water, and is slightly soluble in it. Sulphate of iron precipitates it brown. Mercuric chloride does not affect the solution. Gallic acid produces no change. Albumen is not coagulated. Ammonia gives a white precipitate; metatungstic and picric acids also produce precipitates. On the addition of phosphomolybdic acid a yellowish white precipitate results, which on the addition of ammonia, changes to a blue sediment, dissolving, on continued addition, to a faint blue colour, and gradually becoming colourless. This solution is unchanged by boiling.

Richardson (*loc. cit.*) asserts that when lobelina is boiled with dilute sulphuric acid no glucose is formed. In the present experiments this was not found to be the case. Continued boiling is necessary and a dilute solution of acid, but a certain amount of glucose is invariably produced. Dilute potassic hydrate may be used in the place of the acid with the same result. Lobelina is also decomposed when heated at 212° F., unless in combination with an acid.

The peculiar acid in the drug, called *lobelic acid*

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* "On Lobelina: the active principle of *Lobelia inflata*, and on some other proximate principles of the seed of that plant." —*American Journal of Pharmacy*, vol. xiii., vol. ix. p. 98.

† "Lobelina, a volatile organic base from *Lobelia inflata*." By Mr. William Bastick.—*Pharmaceutical Journal*, 1st series, vol. x., p. 270.

‡ *American Journal of Pharmacy*, iv., series ii., p. 293.

by Pereira,* was examined more in detail by Proctor (*loc. cit.*) who, in 1836, had mistaken it for gallic acid.

It may be best prepared by adding a solution of sulphate of copper to the decoction of the drug as long as a precipitate falls, washing the precipitate on a filter, suspending in water, and passing in sulphuretted hydrogen until the mixture becomes of a uniform deep brown hue. The solution is then gently heated, and the cupric sulphide formed is removed by filtration. The filtrate is now carefully evaporated, and from the residue thus obtained the lobelic acid is extracted with boiling ether. On the evaporation of the ether a yellow crystalline mass was obtained, having a decided acid reaction. By dissolving in cold ether and evaporating, the acid is obtained in small acicular crystals.

Lobelic acid is soluble in water, alcohol, and ether, and is non-volatile. In water solution it is precipitated green by sulphate of copper, the precipitate being soluble in acetic acid and the alkalies. Ferric chloride produces a brown precipitate, but slightly soluble in acids or alkalies. Acetate of lead gives a copious yellow precipitate; nitrate of silver a white precipitate, becoming of a red brown colour on standing. Mercuric nitrate gives a dirty white precipitate, while chloride of barium produces no change in the solution.

The decoction, obtained by boiling two ounces of the drug in a pint of water for half an hour, and filtering, is of a red brown colour. It is rendered slightly turbid on the addition of alcohol; becomes brown, then yellow, when treated with ammonia; yellow, then red, when sulphuric acid is added, and is not turned blue by iodine. On the addition of the metals mentioned under lobelic acid, precipitates are obtained of a darker colour than those obtained with a solution of the pure acid.

Lobelina exists in the plant as a salt of lobelic acid—the *lobeliate of lobelina.* It was prepared by Proctor, and by the writer, by mixing aqueous solutions of the two principles, concentrating slightly, and allowing the salt to crystallize out, it being but moderately soluble in water. On boiling it is decomposed, and on treating with alkalies or acids the lobelina undergoes the glucose fermentation.

The acrid principle of the drug, called *lobelacrin* by Enders, and described by him in Flückiger and Hanbury's 'Pharmacographia,' pp. 357-9, I am forced to believe is simply this salt—the lobeliate of lobelina—with possibly an excess of lobelic acid. It is directed to be prepared by exhausting the drug with spirit of wine, and distilling in the presence of charcoal; the charcoal is then to be washed with water and treated with boiling alcohol. This, on evaporation, gives a green extract, which is purified with chloroform. Warty tufts are thus obtained of a brown colour, soluble in ether and chloroform, only slightly soluble in water. They possess, of course, the acrid taste of lobelia, and are decomposed by boiling with water; by acids and alkalies they are resolved into sugar and lobelic acid.

In the present operations these tufts were found to have an acid reaction. They are soluble in alcohol, chloroform, ether, and amylic alcohol. Nitric and hydrochloric acids dissolve them colourless. Sulphuric acid blackens them.

* 'A Treatise on Materia Medica,' by Jonathan Pereira, vol ii., p. 584.

On dissolving in alcohol and applying solutions of iodine in iodide of potassium, tannic acid, potassic-mercuric-iodide, nitrate of silver, acetate of lead, chloride of platinum, and the other reagents named under lobelina, precipitates are obtained, identical in solubility and reaction with those produced with a solution of the alkaloid alone. Sulphate of copper, ferric chloride, mercuric nitrate, and the other precipitants of lobelic acid also give precipitates resembling those produced by the use of the decoction or a solution of the pure acid. After the removal of the precipitate formed on the addition of potassic-mercuric-iodide, no sugar could be formed by boiling with potassa or dilute sulphuric acid. A dilute solution, applied to the eye, causes instant and excessive dilation of the pupil. A small quantity, administered to a cat, caused violent retching and vomiting and much prostration.

In 1840, Pereira announced the existence of "a volatile acrid principle (oil?), called *lobelianin*, an acid (peculiar), resin, gum, etc."

Water distilled from lobelia is asserted to possess the "peculiar smell and nauseous acrid taste of the plant." In one experiment he obtained "a film of what appeared to be a solid volatile oil."

Proctor (*loc. cit.*), however, from an extended course of experiments finds the distillate to be entirely without the acrid taste of the herb. The present writer found the light brown liquid which comes over when the herb is distilled with water, to have the odour of lobelia somewhat intensified, but nothing that could be said to approach the characteristic taste of the plant. On the addition of sulphuric acid it is turned darker. Ferric chloride also darkened it without causing a precipitate. Tannic acid produced no change. Phosphomolybdic acid gave a yellow precipitate which dissolved to a green colour in ammonic hydrate, the solutions becoming yellow on boiling.

According to Reinsch,* the odour of the plant is due to an indeterminate amount of volatile oil, having "a bland taste and pungent odour." The aqueous distillate undoubtedly contains most of this oil, together with indeterminate matter resulting from the decomposition of the lobelina.

In the analysis of the writer above quoted, a "peculiar substance" is mentioned, to which he has applied the name *lobeliin.* It was evidently supposed to be the active principle of the plant. It was obtained by treating an alcoholic extract with ether, evaporating and digesting with alcohol of ninety-four per cent., again evaporating the solution, and dissolving the extract in water. This solution has an acid reaction, is of a brown colour, tastes slightly bitter and leaves a pungent after-taste, similar to that of tobacco. On evaporating it, the lobelin remains. It is soluble in water and alcohol, not in ether. The aqueous solution is not rendered turbid by ammonia, but the colour is slightly increased. Acids effect no alterations in it. Tincture of iodine renders even a weak solution turbid, and produces a reddish—brown colour. Nitrate of mercury gives a light yellow, and nitrate of silver a white precipitate, the latter quickly changing colour and assuming a reddish-brown tint. "Acetate of lead, acetate of copper, bichloride of mercury do not react on it."

Reinsch admits that the lobeliin thus obtained

* 'Analysis of Lobelia,' by Reinsch. *Pharmaceutischer Central-Blatt*, No. 31, July 5, 1843.

was not pure. It was evidently not considered as a vegetable base. In the original paper as found in the *Pharmaceutical Journal*, III., p. 125, no mention is made of its having an alkaline reaction, although Husemann reports Reinsch as claiming it to be a "yellow, gum-like, hygroscopic substance, *with an alkaline reaction*."

It is evidently a very indefinite compound. Some traces of lobelina possibly escape decomposition and afford the tests with iodine, tincture of galls, nitrate of mercury and nitrate of silver. Owing to the small amount present no precipitate was obtained with acetate of lead which reacts with lobelina only in concentrated solution. These precipitates may also be due in part to the presence of lobelic acid with which the lobelina exists in combination in the plant. Much indeterminate matter must also accompany these two principles.

The substance isolated by Colhoun* as the active principle of the drug, and called by him *Lobelia*, has since been shown by Proctor (*loc. cit.*), to be the hydrochlorate of lobelina.

The so-called "mucous gum" and "vegetable gluten" of Reinsch, obtained respectively from the decoction and tincture of the plant, as well as the "resin" mentioned by Pereira, were prepared, but were not deemed of sufficient importance to justify extended investigation.

University of Michigan School of Pharmacy,
Nov., 1877.

* "On Lobelina, the Active Principle of *Lobelia inflata*," by S. Colhoun, M., *Journal of Philadelphia College of Pharmacy*, Jan., 1834.

NOTES ON THE MEDICINAL PLANTS OF LIBERIA.

BY E. M. HOLMES, F.L.S.

Curator of the Museum of the Pharmaceutical Society.

Although many of the productions of the Western Coast of Africa are known by name, yet comparatively little has been recorded concerning the plants used in medicine by the natives, especially in Liberia, where the people are very jealous of Europeans. The nephew of the late president of that country, Dr. Roberts, believing that there are in Liberia some plants sufficiently valuable to be used in medicine in other countries, has promised to send over various kinds for trial in this country, through his business agent Mr. T. Christy of Fenchurch Street, and it is proposed from time to time to notice in this Journal such of them as can be identified.

"FEVER PLANT" (*Ocymum viride*, Willd.).—This is an erect somewhat shrubby plant, about three feet high, with ovate lanceolate acuminate leaves from one to two inches long, the leaves being crenate at the margin and abundantly dotted underneath with oil glands. From *O. gratissimum*, L., a closely allied species, it differs chiefly in its lesser size and in the teeth of the calyx being less united. The plant when rubbed or chewed gives off a strong odour like that of lemon thyme (*Thymus citriodorus*, Schreb).

Lindley states that *Ocymum viride*, is used in Sierra Leone as a remedy for the fevers prevalent in that country.

Dr. Roberts assures me that in Liberia it is the common remedy for fever of any kind, and that he has entirely substituted it for quinine in his practice, since he finds it much cheaper and equally effectual. It is given in the form of infusion, a wineglassful being administered at intervals until perspiration is freely induced, the patient being kept warm in bed.

The thyme-like odour of the plant suggests that its properties may possibly be due to the presence of thymol, a substance which has recently attracted some attention, and deservedly so, since it belongs to the highly antiseptic group of phenols, and can be taken internally with much less danger than carbolic acid. The knowledge we possess of the properties of *O. viride*, and a few other species nearly allied to it, still further strengthens this supposition. *O. canum*, Sims, *O. gratissimum*, L., in India, and *O. crispum*, Thunb., in Japan, are used to restrain mucous discharge in catarrh; *O. sanctum*, L., is used in India, according to Ainslie, as a febrifuge, and a decoction of the seeds of *O. gratissimum* is used in Brazil for gonorrhœa. Dr. Waitz found the same plant cure aphthæ in children when ordinary European remedies failed. *O. tenuiflorum*, L., is used as an aromatic stimulant in Java.

Dr. Lewin, in Virchow's 'Archives,' has lately pointed out that thymol, in the proportion of 1 part to 1000, is capable of arresting various processes of fermentation, and recommends it as a remedy for stomachic fermentation and dilatation, and in diseases depending upon the action of living organic germs, such as diphtheria. He states also that it arrests excessive secretion from mucous membranes. From the above remarks it will be seen that the properties of the fever plant very closely resemble those of thymol. It remains to be determined, however, whether its efficacy is due to thymol alone or to some other constituent as well.

"HÆMORRHAGE PLANT" (*Aspilia latifolia*, O. and H.).—This is a herbaceous plant belonging to the natural order Compositæ, from one and a-half to four feet high, with spreading branches and opposite very rough foliage. The leaves are ovate, acuminate, minutely serrate, and very hard to the touch, owing to the leaf being covered with very short rigid hairs. The flowers are yellow and about the size of those of the fleabane (*Pulicaria dysenterica*, Gaertn). The florets of the ray are neuter, a feature which readily distinguishes this genus from those African genera to which it is most nearly allied. From the other African species of the same genus, it is known by the pappus being almost obsolete, by the shape of the leaves, and by the scales of the involucre being equal in height to the florets of the disc. The account given by Dr. Roberts of the hæmostatic properties of this plant partake of the marvellous. He states (*in litt.*) that the natives always prefer to use it to any treatment adopted by the Europeans. He further says that he has witnessed its use in several cuts where the arteries have been severed, the leaves and flowers being pounded together and applied to the wound, the hæmorrhage stopping in a few minutes and the wound healing rapidly without any other application. The decoction, in doses of ℥ss three times a day, is used in hæmorrhage from the lungs. Dr. Roberts is not sure, however, whether the dried plant would answer as well, as he had only seen the fresh plant used. The properties of this plant certainly are worth investigation, so that it may be determined whether its action is merely mechanical, like that of matico, or whether its juice, like that of *Jatropha*

Curcas, L., possesses an inherent property of coagulating the fibrine of the blood.

Small Senna (*Cassia occidentalis*, L.).—The leaves of this plant are used in Liberia as a purgative, and are known under the above name, while those of a plant with larger leaves, apparently a *Croton*, are known as "large senna." The materials as yet received are not sufficient to identify the latter plant. According to the 'Plants Médicinales de Maurice,' Dr. Livingstone brought to the Botanical Gardens at the Mauritius the seeds of this plant, which he stated that the natives in the interior of Africa roasted and used like coffee. It is now naturalized in the Mauritius, and is said to be used occasionally with good effect in certain cases of asthma and also as a fomentation in some diseases of the skin. According to Macfayden a decoction of the root possesses diuretic properties and the leaves are used by the negroes, when smeared with a little candle grease, as a substitute for adhesive plaister. Martius states that in Brazil, where the plant is called *Gaja marioba*, the root is used in incipient dropsy and in obstructions and weakness of the stomach, it being considered a powerful stimulant to the lymphatic system. It does not appear that the seeds, leaves, or roots are so used in Liberia. *C. occidentalis* is also common in both the East and West Indies.

Pipybras (*Scoparia dulcis*, L.).—This scrophulariaceous plant, which is common in tropical countries in all parts of the world, is used in Liberia for gravel and kidney complaints. A wineglassful of the decoction is taken when cold, three times a day, tea and coffee being forbidden during its use. The leaves are broadly lanceolate, serrate, thin and smooth. The two-valved fruit when mature dehisces septicidally, showing the placenta and seeds free in the centre. The plant is herbaceous, one to three feet high, and much branched, the leaves and branches being usually in whorls of three. The small white flowers have remarkably slender short pedicels and are arranged in a racemose manner.

Sassy Bark (*Erythrophlœum Guineense*, Don).—This tree which is abundant in Liberia, is only used as a poison. Its medicinal properties have only recently been investigated by Dr. T. Lauder Brunton.* The plant has already been figured in this Journal and a full description of it given.†

NOTE ON GERANIUM OIL.

BY PROFESSOR DRAGENDORFF.

In the year 1876 I described in the *Pharmaceutical Journal* a number of reactions by which the more important essential oils could be recognized and distinguished from each other. Part of the oils used in the experiments referred to, upon which I based my statements, were prepared in my laboratory, but some of them were obtained from commercial sources. Among the latter, for the purity of which I could not guarantee, there were a French and a Turkish geranium oil. Through the kindness of Mr. H. W. Langbeck, Leman Street, Whitechapel, London, my attention has been called to the fact, that a good freshly rectified reputed geranium oil, derived from a species of *Andropogon*, does not correspond in its reactions either with the Turkish or the French oil. Mr. Langbeck, who is engaged in the rectification of geranium oil for commercial purposes, was so kind as to send me a sample of his manufacture, and upon the ground of experiments that I have made with this oil I can entirely confirm his opinion.

The oil which Mr. Langbeck has sent to me is perfectly colourless, and has an agreeable geranium odour; it decolorizes bromochloroform, and does not acquire with it any colour even after standing some time. With chloral it forms an almost colourless mixture. In alcoholic hydrochloric acid it dissolves equally colourless, but becomes very slowly reddish, and subsequently of a turbid red-brown colour. The oil is dissolved by concentrated sulphuric acid with a dark gamboge colour, but with it as well as with Fröhde's reagent it soon assumes a brown colour. A mixture of alcoholic hydrochloric acid and chloral forms with it, as pointed out to me by Mr. Langbeck, a rose-coloured solution.

The difference between the results obtained in my former experiments and the present is probably hardly to be referred to difference in age of the oils used. I conjecture that they were obtained from different plants, and that either both of the oils formerly examined by me were actually prepared from the rose geranium, or from a species of *Andropogon* different from that from which the oil of Mr. Langbeck was obtained.

Dorpat.

NOTES ON INDIAN DRUGS.

BY W. DYMOCK.

(*Continued from page* 522.)

Urticaceæ, Gen. ? Sp. ?—*Local name*, Pokli.

Herbaceous plant, with serrate leaves and minute green flowers; found in Goa. The fresh roots are tuberous and spindle-shaped, eight to twelve inches long, one to two inches in diameter; they diverge from a central woody stock, and are covered by a thin brown scaly epidermis; they consist of a thick cortical portion and a soft central woody part easily cut when fresh. Sections examined under the microscope show a layer of cells beneath the epidermis loaded with red colouring matter, and within this a vascular system of jointed vessels, which also contain red pigment. The remainder of the root is composed of soft woody tissue loaded with starch. The medullary rays are well marked, and their extension into the cortex is very distinctly seen. Pokli is sweetish and feebly astringent to the taste; its action is purgative.

Berberis (Several Species).—*Local name of the wood*, Darhalad; *the extract*, Rusot; *the fruit*, Zirishk.

Darhalad occurs in pieces one to two inches in diameter, covered by a soft, corky, light brown bark, beneath this is a hard layer of stony cells, forming a complete coating to the stem; this layer is marked by longitudinal furrows, corresponding to the medullary rays, which are very prominent and close grained, and contain many stony cells. Between the rays are wedge-shaped portions of wood supplied with very large fenestrated vessels, and external to each wedge-shaped portion is situated a peculiar band of a pale yellow colour, which lies in contact with the stony envelope. There is a small close-grained central column consisting of cells containing starch. All parts of the wood are impregnated with yellow colouring matter, freely soluble in water.

Rusot is a dark brown extract of the consistence of opium, having a bitter and astringent taste, readily

* *Lancet*, March 17, 1877, p. 377.

† *Pharmaceutical Journal* [1], vol. xvi., p. 235.

soluble in water, partly so in rectified spirit, forming rich yellowish-brown solutions which become bright yellow when diluted.

Zirishk is a moist sticky mass of small black fruit rather larger than English barberries; most of them are abortive, but a few contain one or two oblong seeds about $\frac{3}{20}$ths of an inch in length, with a thin roughish brown testa, beneath which is a membranaceous covering. The perisperm is yellow; embryo nearly as long as the perisperm, yellow, erect; cotyledons oblong; radicle sub-cylindric, inferior.

Darhalad comes to Bombay from Northern India, and from the Madras Presidency. Rusot and Zirishk from Northern India.

NELUMBIUM SPECIOSUM.—*Local name*, KAMAL.

The calyx consists of four or five deciduous sepals, the corolla of numerous deciduous petals, arranged in several rows; the stamens are numerous, in several rows, attached with the petals to the base of the receptacle; the stigma is sessile; the dry flowers have a brown colour. The seeds (Kamal Kahri) are black, and like small acorns. Both Hindus and Mahometans consider the flowers to be cooling and astringent. As an external cooling application lotus flowers are made into a paste with sandal wood or emblic myrobalans. The seeds are used as a food, and in times of scarcity the roots are eaten, but they are bitter and unpalatable. The seeds are imported from Persia in large quantities. The dried flowers are sold in the shops, but those of Nymphæa are generally substituted for them, and are accepted by the natives as having the same properties.

ANASTATICA HIEROCHUNTINA.—*Local name*, KAF-I-MARYAM.

There can be little doubt that the dried plant was first introduced into India by the Mahometans. It is kept in all the druggists' shops and is prescribed in difficult labour, being placed in water until it expands; the water is administered to the patient. The whole plant is used. It has a short woody stem, branched in a corymbose manner at the top; leaves obovate, the lower ones entire, the upper remotely toothed (seldom present in the dry specimens). The fruit forms spikes along the branches; it consists of a short pouch with a strong curved beak, and two earlike projections on each side, which is divided into four cells, each cell containing a yellow concavo-convex seed. The whole plant is tomatose and has hardly any taste. As seen in the shops it presents the appearance of a little ball of wickerwork. It is imported from Syria by way of the Persian Gulf.

CAPPARIS SPINOSA.—*Local name of Rootbark*, KABAR.

This plant is widely distributed, being found in Asia, Europe, Africa and Australia. The common Indian and Oriental form (Var. 3 of Hooker's 'Indian Flora') grows in the Bombay Presidency. Caper bark does not appear to have been known as a medicine to the Hindus until introduced by the Mahometans, but another species of capparis (*C. aphylla*), very common in Indian and having somewhat similar properties, has a Sanskrit name (*Karira*), and its berries are used by the natives. Capparis is mentioned by both Greek and Latin writers, and its medical properties were probably made known to the Arabs through them. The author of the Makhzan-ul-Adwiya gives a good description of the plant and says that the root bark is the most active part. He considers its action to be detergent and astringent, and recommends it in palsy, dropsy, and gouty and rheumatic affections. The juice of the fresh plant is directed to be dropped into the ear to kill worms, just as cleome juice is used in India. All parts of the plant are said to have a stimulating and astringent effect when applied externally. Ainslie mentions the bark as an imported article, and notices its use as an external application to malignant ulcers. Caper root bark occurs in half quills, several inches in length, it is very thick and transversely fissured; the external surface grey, the internal white; taste bitter and pungent. It is imported *viâ* the Persian Gulf.

PORTULACA QUADRIFIDA.—*Local name*, KURFA.

The creeping annual purslane has probably been long used as a domestic remedy by the Hindus. The Sanskrit name is Loni. The fresh leaves are acid, and are prescribed when bruised as a cooling external application in erysipelas, and an infusion of them is given as a diuretic. In Arabic and Persian books the herb is called baklat-ul-humaka or baklat-ul-mubarika and kurfa. Two kinds are described, the large and the small, the former is probably *P. oleracea*, as its use as a vegetable is noticed. Both are said to be cold or moist, and to have detergent and astringent properties. These herbs can be obtained in most vegetable markets, and the seeds are kept in the druggists' shops. The two portulacas, called burra and chota lonia in Hindustani, may be readily distinguished by their low growth, succulent flat or nearly cylindrical leaves, and small yellow flowers. In *P. quadrifida* there are tufts of bristles in the axils; the seeds are black, minutely tubercled, and kidney shaped.

GARCINIA INDICA.—*Local name*, KOKUM.

The tree is common on the western coast between Damann and Goa; it grows wild upon the hills of the Concan, but is often to be seen in gardens close to the sea. It flowers about Christmas, and ripens its fruit in April and May. The fruit is largely used all along the western coast as an acid ingredient in curries, and is an article of commerce in the dry state. It is generally prepared by removing the seeds and drying the pulp in the sun; the latter is then slightly salted, and is ready for the market. In Goa the pulp is sometimes separated from the skin, and made into large globular or elongated masses. The seeds are pounded and boiled to extract the oil, which on cooling becomes gradually solid, and is roughly moulded by hand into egg-shaped balls, or concavo-convex cakes. This is the substance known as kokum butter; the natives occasionally use it for cooking, but the statement that it is largely used in Goa to adulterate ghee (liquid butter) is incorrect. The apothecaries of Goa prepare a very fine purple syrup from the fruit which is worthy of attention. The fruit is spherical, about the size of a small orange, purple, containing an acid pulp of a still deeper colour, in which from five to eight reniform seeds are imbedded. The seeds are compressed laterally, wrinkled, about three-fourths of an inch long, by four-tenths broad. The cotyledons are very thick, closely adherent, and have a sweet oily taste. Kokum butter is of a dirty white colour, firm, dry, and friable in the hottest weather, and greasy to the touch like spermaceti; its structure is crystalline. It generally contains impurities, and requires to be remelted and strained before it can be used for pharmaceutical purposes. Its chief fault is that it has a yellowish tinge, which makes ointment prepared with it inferior in appearance to that made with spermaceti.

(*To be continued.*)

THE MEDICINAL CHLORINE-DERIVATIVES OF ALCOHOL.*

(*Concluded from page* 550.)

Croton-chloral is distinguished from the ordinary chloral, first, by its melting-point, which is at 78° C. (173° F.), while common chloral melts at 56° C. (133° F.); and second, by the products of its decomposition. *Ethyl-chloral*, when brought into contact with alkalies, splits into *chloroform* and *formic acid:*

$C_2HCl_3O + KHO = CHCl_3 + KCHO_2$
ethyl-chloral + potassa = *chloroform* + potassium *formate*,

while *croton-chloral*, under the same conditions, splits into *dichlorallylene* and *formic acid:*

$C_4H_3Cl_3O + 2KHO = C_3H_2Cl_2 + KCl + KCHO + H_2O$
croton-chloral + potassa = *dichlorallylene* + potassium chloride + potassium formate + water.

Dichlorallylene is an aromatic liquid, boiling at 78° C. (172° F.), but is very unstable, being gradually decomposed, even at ordinary temperatures, acquiring a disagreeable odour, and setting free hydrochloric acid gas. The same phenomena are observed in impure samples of chloroform, and the readiness with which the latter decomposes and becomes acid makes it highly probable that this is owing to a contamination with dichlorallylene. Its presence is easily accounted for by the fact that many manufacturers prepare chloroform from crude alcohol, which contains considerable quantities of *aldehyde*. The latter is converted into croton-chloral, and this, by contact with the chalk during the rectification, into dichlorallylene.

If we, however, accept the new views of the constitution of croton-chloral, according to which it is in reality *butyl-chloral*, we should have the following products of decomposition:

$C_4H_5Cl_3O + 2KHO = C_3H_4Cl_2 + KCl + KCHO_2 + H_2O$
butyl-chloral + potassa = *dichloride of allylene* + potassium chloride + potassium *formate* + water;

and in this case dichloride of allylene is just as unstable as the dichlorallylene mentioned previously, so that the deterioration of chloroform may be owing to the presence of either compound.

Now, since, in the preparation of chloroform from alcohol and chlorinated lime, the intermediate formation of chloral is generally accepted as a fact, it was supposed that an absolutely pure chloroform could be produced by decomposing pure chloral hydrate with alkalies; and this idea was actually carried out in practice, very large quantities of such chloroform being manufactured in Germany, chiefly by Saame and Co., in Ludwigshafen.

Unfortunately, however, the expectation of its superior purity and stability has not been realized. It costs a good deal more than ordinary chloroform, but it is not by any means more stable than the latter. Of three samples of chloroform, one of which was prepared from chloral, which were exposed to the sunlight in half-filled bottles, one sample, consisting of ordinary, and the sample of chloral-chloroform were decomposed with equal rapidity, while the third sample, being purified ordinary chloroform, remained unaltered even after standing six months.

In connection with the above mentioned compounds, which are mostly derived from the ethyl series, may be mentioned another substance also used as an anæsthetic, and frequently used as a substitute for chloroform. We mean the compound CH_2Cl_2, methene chloride, or dichloromethane, usually called *bichloride of methylene*. The chemistry of the latter may be briefly explained as follows: The starting-point of the methyl series is the saturated hydrocarbon CH_4, methane, or marsh-gas, an incondensable gas of sp. gr. 0·559. Chlorine does not act upon it in the dark; in diffused daylight it displaces one atom of hydrogen, forming methyl chloride, or chloromethane:

$$CH_4 + Cl_2 = CH_3Cl + HCl.$$

This latter body, however, may be more easily prepared by heating a mixture of 2 parts of sodium chloride, 1 part of methylic alcohol, and 3 parts of sulphuric acid. It is a colourless gas of sweetish taste and peculiar ethereal odour. The presence of an excess of chlorine successively causes the replacement of more atoms of hydrogen by chlorine, so that we have the following series:

CH_4 methane;
CH_3Cl methyl cloride, chloromethane;
CH_2Cl_2 methene chloride, dichloromethane (*bichloride of methylene*);
$CHCl_3$ methenyl chloride, trichloromethane (*chloroform*);
CCl_4 carbon tetrachloride.

The third compound of this series, the commercial *bichloride of methylene*, is generally prepared by exposing to daylight in a glass globe chlorine gas and gaseous methyl chloride. The globe is provided with two lateral tubes for the admission of the gases, and below with an open neck, which communicates with one of the tubulures of a Woulff's bottle, of which the other tubulure communicates by means of a bent tube with another Woulff's bottle, and this by another bent tube with a flask. The second bottle is surrounded with ice, and the flask immersed in a freezing mixture to condense the volatile products. The bichloride condenses in the flask in a pure state, while the contents of the two Woulff's bottles consist chiefly of chloroform.

Methene chloride, or, to retain the less correct term, *bichloride of methylene*, is therefore rather troublesome to prepare, and higher in price than chloroform, which latter may be prepared in many ways, starting from methyl, ethyl, or even amyl alcohols. Hence it is not uncommon to find chloroform substituted and sold for the other more expensive anæsthetic. They may, however, be distinguished by their boiling-points and specific gravities: chloroform has a sp. gr. of 1492 at 17° C. (62·6° F)., and boils at 63·5° C. (146° F. according to Pierre, but 142° F. according to U. S. Ph.); bichloride of methylene has a sp. gr. of 1360, and boils at 41° C. (106° F.).* A further distinction is their behaviour to a flame; chloroform burns with difficulty with a green-bordered flame, while the other liquid burns with a smoky flame. A solution of iodine in chloroform has a reddish-violet colour, while a solution in bichloride of methylene looks more like an alcoholic tincture. It has also happened that chloroform mixed with alcohol, to reduce the specific gravity, has been substituted and sold for the bichloride. This fraud may, however, easily be detected by shaking it with water, which removes the alcohol.

* From a paper by J. Biel, in *Pharm. Zeit. f. Russl.* 1877, No. 11, and a paper in *L'Union Pharm.*, 1877, 181, with additions by Ed. N. R. From *New Remedies*, October 1877.

*Not at 30·5° C. (87° F.) as Fownes has it. This is the boiling point of the isomer of bichloride of methylene, namely chlorinated methyl chloride CH_2Cl_2, which has a sp. gr. of 1344.

HYPOPHOSPHORIC ACID.*

BY T. SALZER.

The acid syrup formed when phosphorus, partially covered with water, is exposed to the air (Pelletier's *acide phosphatique*), contains phosphorous, phosphoric, and hypophosphoric acids. The last-named acid is produced by the action of the air on phosphorous acid. It may be separated in the form of a sparingly soluble sodium salt by treating the mixed acids with sodium carbonate or acetate.

Pure hypophosphoric acid is best obtained by treating the lead salt suspended in water with hydrogen sulphide. Its aqueous solution is strongly acid, colourless, and inodorous, and may be boiled without decomposition, but when evaporated to a syrupy consistence it is resolved by heat into phosphorous and phosphoric acids. In its behaviour with reagents it is intermediate between phosphorous and phosphoric acids, which circumstance accounts for its having been so long overlooked in a mixture of these acids.

The acid is perfectly stable in aqueous solution, and is not affected by strong acids in the cold, but when boiled with dilute sulphuric or nitric acid, it is resolved, at a certain state of concentration, into phosphorous and phosphoric acids. The solution of the acid is not oxidized when warmed with dilute hydrogen peroxide, and is not affected by potassium chromate, chlorine, or iodine, even at the boiling heat; neither does it reduce mercuric, auric, or platinic chloride. It produces in solutions of silver a white precipitate, which does not blacken on boiling. The solution is oxidized by potassium permanganate, slowly in the cold, and very rapidly when heated, being converted into phosphoric acid. It is not affected by hydrogen sulphide, sulphur trioxide, or nascent hydrogen.

Hypophosphoric acid is bibasic, and is represented by the formula, H_2PO_3, corresponding with the anhydride, P_2O_4.

The salts of hypophosphoric acid resemble in general those of hypophosphorous and phosphorous acids, being, however, much more stable. At high temperatures they give off hydrogen or hydrogen phosphide, leaving metallic phosphide or phosphate.

The *acid sodium salt*, $NaHPO_3+3H_2O$, is formed on adding sodium acetate in excess to the syrupy liquid produced by the oxidation of moist phosphorus in the air. It crystallizes in oblique rhombic prisms, which dissolve in 45 parts of cold, and 5 parts of boiling water. When gently warmed it loses its water of crystallization, and afterwards gives off inflammable hydrogen, leaving metaphosphate. At ordinary temperatures, both the salt and its aqueous solution are perfectly stable.

The *neutral sodium salt*, $Na_2PO_3+5H_2O$, obtained by neutralizing the acid salt with sodium carbonate, crystallizes in needles, which dissolve in about thirty parts of cold water, forming a feebly alkaline solution.

The *lead salt*, $PbPO_3$, is precipitated by the acid sodium salt from a solution of neutral or basic acetate in the form of a white powder, insoluble in water, dilute acetic acid, and hypophosphoric acid, but soluble in dilute nitric acid. It is easily decomposed by dilute sulphuric acid.

BERBERINA PHOSPHATE.†

BY H. B. PARSONS.

There has been a considerable call during the past year for a freely soluble salt of berberina, to be used as a topical application to inflamed mucous membranes. The muriate and acid sulphate are so nearly insoluble as to be of little service. The phosphate and hypophosphite are freely soluble, but their preparation is expensive owing to the high price of phosphoric and hypophosphorous acids. Accordingly, many spurious phosphates are now upon the market, most of which consist, wholly or in part, of the acid sulphate.

Quantitative analyses of commercial samples of the acid sulphate, and of a so-called "phosphate of hydrastia," gave the the following results, one gram being taken in each case:—

	Acid Sulphate.	"Phosphate."
Berberina ($C_{20}H_{17}NO_4$) . . .	·7650*	·7969†
Sulphuric Acid (H_2SO_4) . . .	·2250‡	·1343§
Phosphate of Calcium $Ca_3(PO_4)_2$		·0600‖
Total . . .	·9900	·9912

The first salt was a true acid sulphate, and was sold as such; the analysis confirms the formula already given by Perrin¶—$C_{20}H_{17}NO_4H_2SO_4$.

The "hydrastia phosphate" contained no hydrastia, which is a *white* alkaloid, found together with berberina in the root of *Hydrastis Canadensis.* Only a trace of phosphoric acid was present, and that as an impurity of calcium phosphate. This preparation has had quite a sale in Cincinnati, under the trade name of "Greve's Phosphate of Hydrastia." The method of preparation is described by Dr. T. L. A. Greve, in the *Eclectic Medical Journal*, July, 1877:—"By saturating diluted phosphoric acid with this alkaloid" (berberina), "a solution of phosphate of berberina is obtained, which is, however, more readily made from the sulphate by boiling with water and precipitated phosphate of lime, when sulphate of lime and phosphate of berberina are formed." That the doctor is mistaken as to the composition of the berberina salt is evident. Some change must certainly have taken place, as "Greve's Phosphate" is more freely soluble than the acid sulphate. The phosphate of calcium in reality abstracted *one half* the sulphuric acid of the acid sulphate, leaving in solution a more soluble normal sulphate, of the composition $(C_{20}H_{17}NO_4)_2H_2SO_4$. The following equation explains the reaction, and is, I believe, substantially correct:—

$$2C_{20}H_{17}NO_4H_2SO_4+Ca_3(PO_4)_2=(C_{20}H_{17}NO_4)_2H_2SO_4+CaSO_4+2CaHPO_4.$$

That this salt is quite soluble, and may answer in medicine is very probable; but to sell it as *phosphate* seems hardly right, as the real phosphate sells at a figure very much above the sulphate or muriate.

Several other phosphates were examined. A sample of the true phosphate, made by precipitation, was found quite acid, because imperfectly washed. A Cincinnati "phosphate of hydrastia" consisted of a sticky, greenish mass, containing much extractive organic matter, the remainder being sulphate of berberina. It was only partially soluble in much hot water, was very acid, and entirely unfit for medicinal uses.

By studying the reactions of berberina sulphate with the various phosphates of calcium, I was led to believe that a *soluble* phosphate of calcium, if boiled with berberina sulphate, would form berberina phosphate and calcium sulphate, and such is the case.

By repeated experiments I find the following process will give satisfactory results:—

℞	Bone Ash—well burned . .	1 troy oz.
	Sulphuric Acid, concent. . .	gr. clxxxv.
	Berberina Sulphate	1 troy oz.
	Alcohol,	
	Water āā	q. s.

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* From *Liebig's Annalen*, clxxxvii., 322—340. Reprinted from the *Journal of the Chemical Society*, Dec. 1877.

† From the *Proceedings of the Michigan Pharmaceutical Association.*

* ·200 grm. required 3·6 c.c. Mayer's solution potassic mercuric iodide. "One c.c. Mayer's solution precipitates 0·425 grm. berberina, weighed as base." Contributions:—School of Pharmacy, Univ. of Mich.; L. F. Beach, *Amer. Journ. Phar.*, September, 1876.

† ·200 grm. required 3·7 to 3·8 c.c. Mayer's solution.

‡ Barium sulphate from one grm. weighed ·535 grm.

§ ,, ,, ,, ·3195 ,,

‖ Magnesium pyrophosphate from ·5 grm. weighed ·0215 grm.

¶ *Journ. Chem. Soc.*, vol. xv., p. 339.

Mix the bone ash with one fluid ounce of water, add the sulphuric acid, stir well, add eight or ten fluid ounces more of water, boil for twenty minutes, strain through fine muslin. To the filtrate add the berberina sulphate, and evaporate to dryness on the steam-bath. Pulverize the residue and treat several times with boiling diluted alcohol. Filter, and allow the filtrate to drop into cold alcohol. The yellow precipitate thus formed is to be dried on filter paper with a gentle heat. More of the phosphate may be obtained by concentrating the alcoholic mother liquor.

As thus prepared, phosphate of berberina is a canary-yellow powder, very freely soluble in water, moderately soluble in cold diluted alcohol and in hot alcohol, slightly soluble in cold alcohol. As will be seen, this process has one advantage, cheapness, and repeated experiments justify me in saying that, with care, a very pure phosphate may be produced.

I hope at some later day to make a fuller report upon this subject.

THE CAVE MUSHROOM.

The following extract is taken from an interesting account of the cave mushroom, by M. Lachaume, a translation of which, with illustrations, is in the course of publication in *The Garden*:—

The mushroom which is reared in the Paris quarries is always much smaller than that which grows naturally in old melon beds, in meadows, or similar places. The earth for "soiling" is very poor, and contains but little humus; but this comparatively slow growth is advantageous from a commercial point of view, medium-sized mushrooms selling better than very large ones in the Paris market. At Vitry, however, a specimen was grown which weighed no less than 6lb. 2oz.; the cap was 13in. in diameter in its widest part, and 6in. where it joined the stem. It was presented, in 1846, by MM. David and Auguste Amiable to Louis Phillippe, who presented them with a reward of 100 francs. It is somewhat singular that the bed which produced this wonder was otherwise most unproductive, the subsequent growings yielded nothing, its whole power having been apparently concentrated upon this single mushroom. M. Carrière also mentions an enormous mushroom which appeared suddenly, in October, 1872, in one of the nursery beds at the Jardin des Plantes after a violent rain storm; the cap measured 8in. in diameter at the widest part and 6in. at the stem, which at $1\frac{1}{2}$in. from the soil measured $2\frac{3}{8}$in. in diameter. The weight was nearly $3\frac{3}{4}$lbs. It was of a dark grey colour, and when cooked was of excellent flavour.

The mushroom, as grown in the Paris quarries, is, so to speak, an artificial production. It is whiter and smaller than those grown in the open air, which is the result of the poorness of the soil and of the deficiency of light. Be this as it may, it has won its position in the market; it is liked and, so to speak, trusted, and the mushroom grower would gain nothing if he tried to increase its size.

In the Department of the Seine there are 3000 quarries; those which have been abandoned and which are situated close to Paris at Montrouge, Bagneux, Vaugirard, Méry, Châtillon, Vitry, Honilles, and St. Denis are used by the 250 mushroom growers of the Department. There are several of these quarries with horizontal galleries driven into the calcareous rock from the level of the road which are mostly large enough to accommodate a good sized cart, but the majority can only be entered, like a coal mine, by vertical shafts 100 to 125ft. deep, down which everything has to pass. The labourers climb up and down a ladder, and the fresh manure is shovelled down the shaft from above, the waste stuff and the mushrooms being hauled up in baskets from below by means of a windlass. The inside of these quarries consists of a number of irregular corridors, varying in height from 2ft. 6in. to 7ft. The manure for making the beds has often to be wheeled to a distance of nearly 350 yards from the mouth of the shaft. When there is plenty of headway, the work is comparatively easy, and the labourer rolls his load merrily along, lighted by the lamp which hangs at the head of his wheelbarrow; but, when the roof is less than a yard from the floor of the gallery, he must walk in a stooping or even in a sitting posture, pushing his heavy wheelbarrow painfully along. This part of the work is somewhat lightened by establishing relays at more or less frequent intervals. These galleries are all thoroughly ventilated, not only for the sake of the labourers, but for that of the mushrooms, which would not thrive in confined air. If the air were not frequently changed, the breath of the labourers, the products of combustion of the lamps, and the gases given off by the slow fermentation of the manure would soon render these quarries uninhabitable. The ventilation is accomplished by means of small shafts sunk in different parts, and surmounted by a tall wooden chimney, the upper end of which is cut at an angle. The top of the chimneys should be above the level of the mouth of the principal shaft, and the bevelled edge should be turned towards the north. The number of ventilating shafts and their distance apart must be regulated by the special wants of each mine. Frequently the mushroom growers content themselves with using the ventilating shafts constructed by the former owners of the quarry, since the construction of each shaft costs from £8 to £40, according to its depth. It sometimes happens that two quarries communicate with each other, in which case the ventilation is an easy matter; it is, however, necessary to guard against strong draughts and sudden changes of temperature, which would interfere with the well-being both of the men and the mushrooms. For this purpose, the usual means employed for the ventilation of coal mines, such as fires and trap doors, are adopted. When the entrance to the quarry is by a horizontal gallery, level with the road, the ventilation is comparatively simple and the work of cultivation much easier. The quarries are let at from £6 to £16 per month, according to the extent and height of their galleries, and the facilities for ventilating them. Not only should the ventilating currents be regular in their strength and motion, but it is advisable that they should always circulate in one direction. In fact, whenever the direction of a current changes, it is a sure sign that there has been a sudden change of temperature, either in some parts of the quarry, or on the surface outside, which is always dangerous to the mushroom crop growing at the time. Atmospheric variations, both inside and out, must, therefore, be narrowly watched, so that the temperature of the quarry may not rise or fall too far above or below the average, and that the ventilating currents should always be kept in the same direction and of the same strength. If the beds are in a cavern, the draughts should be in the direction of from north to south, and the ventilating shafts, and their dampers, should be so constructed that the quantity of air necessary for the proper growth of the mushrooms may be obtained at will. Proper watering plays a great part in mushroom culture; means must, therefore, be taken for obtaining a sufficient supply of water in the quarry itself. It often happens, however, that the opening of the quarry and the locality of the beds are far away from any dwelling, or well, in which case the water is conveyed to the mouth of the shaft in large barrels, holding about 130 gallons, and mounted on wheels. By means of a sail-cloth hose, which is attached to the tap of the barrel, the water is led to the bottom of the shaft, where it is stored in large tubs or tanks. In some quarries sufficient water filters through the rock for the supply of the beds. This, of course, is a piece of good luck for the mushroom grower. In either case, the water is distributed by hand watering cans—a long and laborious process; but M. Renaudot hit on the happy notion of using a machine, consisting of a large tin or zinc barrel capable of holding 5 or 6 gallons of water, and carried on a man's shoulders like a knapsack. To the lower part is attached a tube, ending with a rose, and provided with a tap for turning the supply on and off at will, so that the labourer can water the beds as he walks along, copiously or slightly, according to the amount of watering they require in different spots. It is true that this method is not applicable in caves where the height of the roof of the galleries is less than that of a man; but in other caves, such as those of M. Renaudot, at Méry, it is of great service, both to master and man. It may be mentioned incidentally that the galleries of M. Renaudot's magnificent quarries are no less than 1⅛ mile long, and 13ft. high from floor to roof. The principal entrance of the quarries is in Méry itself, close to the station of the railway which conveys the manure from Paris. When visiting M. Renaudot's quarries, in May, 1873, we had the opportunity of witnessing the influence of keeping the air at a proper temperature. The outside temperature was 53½° F., the inside nearly 5° lower. The beds which were protected from the draught by the windings of the galleries were covered with mushrooms ready for gathering; whilst on those which were in the full current, the mushrooms had hardly begun to make their appearance, even on those beds which had been made a day earlier.

PRODUCTION OF SOLUBLE GLASS AND SILICATE OF POTASH.*

Twenty years since, Liebig suggested that the most rational material for the production of soluble glass was the *farine fossile*. M. F. Capitaine has recently taken up the subject, and has treated it in the pages of *Dingler's Polytechnische Journal*.

It appears that, with the exception of a small production of silicate of potash, the makers of soluble glass have not made any use, or very little, of this peculiar form of soluble silicic acid. The old methods are still in favour, the principal of these being two, one that which is employed in England, and the other that adopted on the Continent. In the English method the glass is produced by boiling silica in a caustic solution, while on the Continent the mode is, first, to make glass with sand, sulphate of soda and charcoal; afterwards, to render it soluble by means of the action of steam under high pressure. M. Capitaine does not think that the *farine* can compete in cheapness with flint when the latter is abundant, but then it has the advantage of being much more soluble.

Flint, broken up into pieces of about a cubic centimetre and submitted, under a pressure of steam of 4½ to 6 atmospheres, to the action of an alkaline lye of the density of 1·25 to 1·30 for six or eight hours, yields glass which is very alkaline and caustic, containing about one part of alkali to two parts of silica. With *farine fossile* a lye of 1·2 density and a pressure of three atmospheres are employed, and in three or four hours' process there is a yield of a much more neutral glass than the preceding, containing about three parts of silica to one part of alkali.

The production of silicate is said to be very easy with *farine fossile*, and M. Capitaine thinks that the causes which have prevented the *farine* being used instead of flint are purely accidental.

The *farine* is first calcined, an operation which takes a long time, because not a trace of the organic matters found in natural earths must be allowed to remain in the product; if this condition be not observed the solution obtained by means of the lye will have a yellowish or brownish tint, which will make it difficult of sale. The mineral is a bad conductor of heat, so that it does not calcine with facility. This inconvenience alone has perhaps caused the *farine* to be neglected by the makers of soluble glass on the score of economy. It is only within a short time that MM. Grüne and Hagermann have produced the calcined product at a relatively low price, and have thus afforded the opportunity of again raising the question whether the wet process with *farine fossile* is not really preferable to the employment of flint.

M. Capitaine with this idea undertook a series of experiments on a large scale. The lyes being prepared partly with caustic soda and partly with carbonate of soda, had densities ranging from 1·22 to 1·24, which were found to be the most advantageous. A reservoir, furnished with mechanical agitators, was about two-thirds filled with lye and the necessary quantity of calcined *farine* added, the stirring being kept up continually. The proportion of *farine* is easily calculated on the *datum* that one part of hydrate of soda dissolves about 2·8 parts of chemically pure *farine*, the quality of which varies but little. Lye of the density indicated produces a rather light solution which presents little resistance to the agitators. If steam is afterwards introduced, the solution becomes very rapid when the pressure reaches about three atmospheres, and at the end of about three hours the silica is completely dissolved. Practice soon shows when the operation is complete by the colour of the liquid, and by the fact that a sample taken out of the reservoir clarifies very rapidly. The colour of the foreign matters then in suspension is of a dark red brick. If an excess of *farine* has been employed, or the boiling has not been continued sufficiently long, the colour will be of a reddish white, and the solution will not clear itself when allowed to stand at rest. A small excess of silica left undissolved will cause the solution to remain turbid for a very long time, and it is extremely difficult to get rid of the excess by filtration. But this inconvenience is easily avoided by care in practice, and a uniform solution is obtained, which clears itself readily. One condition must, however, be always observed. If the lye be too concentrated, of a density of 1·3, for instance, the solution precipitates but very slowly the fine sand and oxide of iron which it holds in solution; a week is hardly sufficient for this to be completed. Too strong a lye should, therefore, not be employed; the density of the solution should not exceed 1·18.

If the silicate has a density exceeding 1·18, the best way is to reduce it by the addition of water; the clarification will proceed very quickly, and at the end of four-and-twenty hours the liquid will be perfectly white and clear. The deposit which is thrown down, composed of sand and oxide of iron, is rather more abundant than in the case of a solution of flint, but it is easily washed, and if mixed with diluted soluble glass, forms good glaze or dressing.

For the preparation of silicate of potash, which is to contain as strong a proportion as possible of silica, for surgical purposes, the *farine fossile* is said to be peculiarly adapted. In this case the boiling must be continued for one or two hours longer than in the case of soluble glass, with an addition of 10 to 15 per cent. of *farine*; by these means a liquid is obtained rich in silica, which begins to congeal when its density is 1·32.

Farine fossile may also be employed in combination with flint. A glass is first produced from flint, which is afterwards converted into a neutral silicate by being well agitated with *farine* in a second vessel; or, a single apparatus may be made to suffice, by adding to the flint the necessary quantity of *farine*.

* From *The Journal of the Society of Arts*, January 11.

SOLUTION OF DIALYSED IRON AS AN ANTIDOTE FOR ARSENICAL POISONING.*

BY RICH. V. MATTISON, PH.G

The statement having been currently made by a number of manufacturers of solution of dialysed iron that this article was of great value as an antidote in cases of arsenical poisoning, and this statement having subsequently been either doubted or "damned with faint praise" by recent writers, led the author to undertake,

* From the *American Journal of Pharmacy*, January.

for personal satisfaction no less than the general good, to perform the following experiments, with the idea of directly confirming one or the other of the above views. In furtherance of this object, a careful test was made of the glassware and reagents employed for the presence of arsenic, with negative results.

A. Ten centigrams of arsenious acid was dissolved in 25 cubic centimetres of distilled water, and tested for arsenic, abundant evidence of which was readily shown. To this solution 5 cubic centimetres of a 5 per cent. solution of dialysed iron was added, and the whole diluted with distilled water to the measure of 100 cubic centimetres, and filtered. No apparent change was effected, the filtrate giving abundant evidence of the presence of arsenic. The experiment was again performed, substituting ordinary water, with like result.

B. A like quantity of arsenious acid was dissolved in the same amount of distilled water as before, with the addition of a few drops of hydrochloric acid, and to this solution 5 cubic centimetres of solution of dialysed iron was added, and the filtrate tested as before, with like result. The experiment was then varied by the substitution of ordinary water and the addition of, first, 1 cubic centimetre of the iron solution, and afterward the addition of 25 cubic centimetres, and dilution of the whole with water to the measure of 100 cubic centimetres; the various testings were without change, the abundance of arsenic being readily shown.

C. A third experiment was now instituted. Ten centigrams of arsenious acid being taken as before, and dissolved in the same quantity of water, this was added to 1000 cubic centimetres of a solution made to represent the gastric secretion of the human stomach, and composed as follows:

Water	994·40
Pepsin	3·19
Chloride Sodium	1·46
Chloride Potassium	0·55
Chloride Calcium.	0·06
Hydrochloric Acid	0·20
Phosphate Magnesium	0·12

The quantity of this fluid taken (1000 cubic centimetres) was believed to represent about the normal quantity of gastric juice present in the human stomach during digestion, or that would be induced upon the ingestion of a quantity of arsenic. Immediately after the addition of the iron solution, the whole was transferred to a filter, and the colourless filtrate tested by Fleitmann's and Marsh's test. No evidence of the presence of arsenic could be discovered, and the experiment was repeated with like result.

The experiment was then varied by dissolving 50 centigrams of arsenious acid in the above quantity of artificial gastric fluid, and allowing the whole to remain at a temperature of 38°C. (100°F) for two hours, with occasional agitation. The mixture was then transferred to a filter, and 100 cubic centimetres of the filtrate evaporated to 5 cubic centimetres and this added to a Marsh's apparatus of 100 cubic centimetres capacity, without the slightest trace of arsenic being shown on the application of the test.

This experiment was repeated with like result, with both Fleitmann's and Marsh's tests, without a trace of arsenic being obtained.

After the repeated unsuccessful attempts to detect the presence of arsenic in this way, one drop of liquor arsenii chloridi was added to each flask (still containing the filtrates as above described), and the result was immediate, the presence of arsenic in considerable quantity being instantly shown by the characteristic reactions.

Through these experiments, then, the facts seem clearly set forth, (1) that dialysed iron, to be of value as an arsenical antidote, must be first precipitated by the action of some neutral salt; (2) that this precipitation, and the consequent production of ferric hydrate, is accomplished when this preparation is taken into the stomach, and that, (3) therefore, the solution of dialysed iron is a valuable antidote for arsenical poisoning, and should be administered promptly in cases of emergency, followed, of course, by an emetic until more efficient remedies can be used.

It, however, may readily be conceived that an antidote may be necessary in cases where the enfeebled stomach of the invalid may not be able to secrete sufficient gastric juice, even under the direct stimulus of the poison, or that the arsenic may be ingested into a stomach that is free from the presence of any gastric secretion. Now, while under these circumstances the mucous secretion might prevent absorption for a certain length of time, yet in these cases, and, indeed, we believe in *all* cases, the administration of solution of dialysed iron as an antidote for arsenical poisoning should be immediately followed by a teaspoonful or more of sodium chloride, thus insuring the formation of ferric hydrate and the consequent neutralization of the poison.

With this addition, solution of dialysed iron is the most convenient antidote, certainly, to be obtained, and should be kept in every well-regulated pharmacy for cases of emergency; and manufacturers should make the addition to their labels directing the additional use of this salt (sodium chloride), as through its use, while no harm can be done, many valuable lives might be saved, which, through the use of dialysed iron alone, would possibly be sacrificed.

Since the above was in the hands of the publishers, we note a case of arsenical poisoning successfully treated by the administration of solution of dialysed iron alone, as reported in the Philadelphia *Medical Times*, Dec. 8th, pp. 104, 105. The patient, a young lady of normal health, inadvertently swallowed a considerable quantity of arsenic, which had became by accident mixed with some confectionery, and when the attending physician saw her she presented the symptoms of poisoning in a well-marked degree. Solution of dialysed iron was administered with prompt relief, yet, strange to say, this was not followed by an emetic, but the use of the dialysed iron continued in doses of 2 fluidrachms, largely diluted with water. The doctor notes the recovery of the patient.

The occurrence of this case and the treatment pursued, while successful, does not convince us that it would in a similar case be at all proper or justifiable to rely entirely on the solution of dialysed iron as an efficient antidote, if not followed by the free use of sodium chloride; as we contend that where any doubt exists the patient should have the benefit of it, and, through the exhibition of other remedies, so multiply the chances of escape that death should ensue only from neglect of these.

NEW REACTION OF MORPHINE.*

BY G. PELLAGRI.

The suspected substance, evaporated at a gentle heat if necessary, is dissolved in concentrated hydrochloric acid, a small quantity of sulphuric acid is added, and the mixture evaporated on an oil-bath at a temperature of 100° to 120°. If morphine be present, the liquid acquires at its edges a purple colour, which is not masked by the carbonization of organic matter, and when all the hydrochloric acid has been driven off, the sulphuric acid remains of a red colour. This dissolves in concentrated hydrochloric acid, and becomes violet on neutralization with sodium bicarbonate. This colour is insoluble in ether, but if a few drops of hydriodic acid be added, it changes to green, and is now soluble in ether, colouring it purple. These colour changes are very delicate, and are common to apomorphine, into which the morphine is changed by the action of the acid. Codeine also gives the same reactions, but its solubility in ether serves to distinguish it from morphine. Brucine when treated in a similar manner gives a blue colour on neutralization with sodium bicarbonate, but the reaction is not delicate.

* *Gazzetta chimica italiana*, vii., 297-298. From the *Journal of the Chemical Society*, December 1877.

The Pharmaceutical Journal.

SATURDAY, JANUARY 19, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE IMPORTATION OF PHARMACEUTICAL PREPARATIONS INTO FRANCE.

WE learn from a French contemporary that the restrictions imposed upon the admission of foreign pharmaceutical preparations into France have recently been under the consideration of the Committee of Public Health attached to the department of the Minister of Agriculture and Commerce. The result has been the presentation of a report, in which the Committee recommends some relaxation of the conditions affecting the admission into France of foreign pharmaceutical preparations.

In order to render the subject clear to our readers, it may be well to state that according to the existing law the importation of all medicinal preparations, except distilled waters and extract of cinchona bark, is prohibited unless certain formalities are gone through with the object of obtaining admission. For this purpose it is necessary that the preparations in question should be recognized by the Ecole de Pharmacie as being "necessary or useful," and then they are passed by the Customs only on payment of a duty of twenty per cent.

These restrictions are considered to be too rigorous and to bear too much the character of protectionist principles that are out of date and otherwise undesirable. Another argument in favour of removing the barrier to the importation of foreign pharmaceutical preparations into France is afforded by the circumstance that similar preparations of French manufacture are very largely in demand in other countries where there are no such restrictions to bar their introduction to commerce. Moreover, reciprocity in regard to the importation of such articles seems desirable in order to secure a continuance of the free admission of French preparations into other countries, and it appears that the Italian Government has intimated that it is only under such conditions that the free importation of French medicinal preparations will be permitted.

All these arguments have been considered by the French Committee of Public Health, and it is admitted that in order to be entitled to the characteristic of being "useful," it is not indispensable that a preparation should possess new therapeutic properties; it may be sufficient for this purpose to modify the form of a preparation and thus to render its administration more easy by masking or disguising a repulsive smell or taste. Such means of overcoming the fancies of invalids are not without their utility and consequent importance.

In the report of the Committee it is remarked that while there exist in all civilized countries official pharmacopœias, or at least such as are in general use, by which the composition and preparation of medicines ordered by physicians are regulated, the formulæ of these pharmaceutical preparations often differ from those adopted in the French Codex. In regard to this it is added that since invalids attach great significance to the form in which medicine is administered, and generally judge of its therapeutic value by this character, there would be no advantage gained by disregarding this fact, although from a medical point of view it may only be indicative of a prejudice.

As regards medicines prepared in France the law considers public safety to be sufficiently protected when the responsibility for the pharmaceutical preparations administered to the sick rests conjointly upon the physician who prescribes and upon the pharmacist who supplies them. The Committee in its report expresses inability to discover any reasons for making greater demands in regard to medicines prepared in foreign countries, and it is considered that the protective influence of this double responsibility is quite independent of the circumstance that the preparations in question are of French or foreign origin.

In pursuance of these views the Committee has submitted to the Government the following suggestions:

1. That the restrictions imposed by the law of 1817 should not apply to compound medicines, the importation of which is demanded by a pharmacist, and that these medicines should be admissible subject to a duty of ten per cent. *ad valorem*; the value to be determined by the Ecole Supérieure de Pharmacie.

2. That the sale of foreign compound medicines admitted into France should be subject to the same regulations as the sale of similar products of French manufacture.

Acting upon these recommendations the Minister of Agriculture and Commerce has, in the draft of a bill presented by him last year to the French chamber in relation to the customs, proposed to allow the importation of such foreign pharmaceutical preparations as are comprised in the official pharmacopœias of other countries, subject to a duty of ten per cent., independently of a further compensatory duty in the case of medicines prepared with materials subject to customs or excise duty. As regards preparations that are not comprised in official pharmacopœias, however, it is still proposed to maintain the existing prohibitory restrictions. This bill was not discussed by the legislature during the late session, but it is likely to be soon brought forward.

THE CHEMISTS' BALL.

The Twelfth Annual Chemists' Ball took place on Wednesday last, and was as successful in point of numbers and in every other respect as any that has preceded it. As usual the only toast was "Success to the Chemists' Ball." This was proposed by the Chairman for the evening, Mr. George Webb Sandford, who said that when a few years ago it was proposed to have such a Ball, some of the older and more prudent doubted the advisability of making the attempt. But the younger friends were enthusiastic, and the result had been these twelve annual gatherings. Mr. Sandford added that he had many pleasant reminiscences of meetings in connection with pharmacy, but none were so perfectly unalloyed as those relating to the Chemists' Ball, where the company met by a kind of natural affinity that gave place to an elective affinity with no discordant elements to disturb it. The toast was heartily received, and followed by a cheer for the ladies. The enjoyment of the company was much enhanced by the admirable manner in which the arrangements were carried out by the Honorary Secretary, Mr. Walter Hills, and by Mr. T. C. W. Martin, who acted as M.C.

CULTIVATION OF THE CINCHONA IN THE UNITED STATES.

It would appear from the Report of the Commissioner of Agriculture that an attempt which has been made to introduce the cultivation of the cinchona into the United States has not up to the present time turned out very favourably. During the past ten years a continuous supply of young plants of several species of cinchona has been maintained by a yearly propagation of young plants equal to the numbers distributed. Plants have been sent to California and to several of the Southern States, mainly to Florida. The reports that have reached the department do not indicate success in their culture, owing to adverse climatic influences. Experiments here show that none of the species will stand the slightest frost without injury, and even in the equable atmosphere of the greenhouse their vitality is impaired when the temperature is below 50°. Whether or not the climatic conditions for the growth of cinchonas exist in any portion of the United States is a question not yet solved, but, so far as present knowledge warrants an opinion, further experiments should be confined to the locality of San Diego, California, as offering greater promise of success than any other point.

THE LONDON CHEMISTS' ASSISTANTS' ASSOCIATION.

We have received from the Secretary of the above Association a printed Calendar of Meetings to be held during the first session ending the 24th of April, 1878. From this we learn that on Wednesday next a paper will be read, entitled, "Dispensing Notes on Preparations of Phosphorus," by Mr. Glover.

Transactions of the Pharmaceutical Society.

BENEVOLENT FUND.

List of Subscriptions and Donations received during the months of November and December, 1877.

	£	s.	d.
A Helping Hand	0	2	0
Cutler, George C., High Street, Rickmansworth	0	5	0
Jeffries. Henry, Guildford	0	10	6
Jenner, Charles U., Hailsham	0	10	0
Johnstone, Walter, Cromarty	0	3	0
Lance, W. N. G., 208, Copenhagen Street, N.	0	10	6
Lister, George, Cottingham	1	1	0
Maughan, Samuel, Binbrook	0	10	6
Minshull, Miss Rose Coombes, 3, Rodney Terrace West, Bow Road, E.	1	1	0
Moore, Thomas, Sheepshed	0	5	0
Nottingham, T., Beccles	0	5	0
Peacock, John R., 7, Corn Market, Belfast	0	2	6
Ralph, P., Hereford	0	10	6
Scarlett, Wm., Hanley	0	5	0
Sheldrake, George, 39, Herbert St., Bolton Wood, Bradford	0	5	0
Snoxell, Samuel, 135, High Street, Guildford	0	10	6
Taylor, Charles, 10, Cleveland Square, Liverpool	0	10	0
Tirrell, John, Market Square, Hanley	0	5	0
Wallace, Wm., 71, St. Vincent Street, Glasgow	0	5	0
Weeks, Albert J. J., Stapleton Road, Bristol	2	2	0
Wills, Geo. S. V., 62, Lambeth Road, S.E.	0	10	6

Donations.

	£	s.	d.
Smith, T. and H. and Co., 21, Duke Street, Edinburgh	5	5	0

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

A meeting of the Glasgow Chemists and Druggists Association was held in the Andersonian College, George Street, on Wednesday evening, the 9th inst. In the absence of Mr. Frazer, President, the Vice-President (Mr. Fairlie) occupied the chair. The minutes of the previous meeting having been read and approved, Mr. J. Paton, F.L.S., Curator of the City Industrial Museum, was introduced, and delivered a lecture on Opium.

Mr. Paton divided his subject under the heads of history, geographical source, cultivation and commerce. Under the first head he sketched the history of the plant from three centuries B.C. up to the present, giving some very interesting facts concerning its use in ancient times, and stating that directly and indirectly it had been the cause of various national wars. The lecturer next observed that opium was one of the greatest producers of both pleasure and pain and the most remarkable drug in existance, standing unequalled and alone. He confined his remarks more especially to the plant cultivated in Asia Minor and Smyrna and in India, as being the most important sources, and described very minutely the commercial cultivation of the plant in both countries, from the sowing of the seed up to the final disposal of the opium in the marts of commerce. Interesting statistics were given as to quantity of seed sown per acre, the yield per acre, and the variable total crop; the passing of the opium from one trader on to another was also fully described. A collection of opium from various sources and products therefrom was exhibited.

On the motion of the chairman a hearty vote of thanks was awarded the lecturer.

Proceedings of Scientific Societies.

PATHOLOGICAL SOCIETY OF LONDON.*

Lactic Fermentation and its Bearings on Pathology.

BY JOSEPH LISTER, F.R.S.

(*Concluded from page* 558).

Now before I go further, I wish to make a confession. Next to the promulgation of new truth, the best thing I

* Address delivered Tuesday, December 18, 1877.

conceive that a man can do is the recantation of published error. Some years ago I published in the *Microscopical Journal* an account of the behaviour, as I supposed, of the bacterium lactis in different liquids. I described that, having obtained souring milk, I inoculated unboiled urine with a small drop, and the result was the development in the urine of a very different sort of organisms in appearance; instead of being small as these are, about $\frac{1}{20000}$ of an inch in length, and half that breadth, those were comparatively broad and exceedingly long and coiled organisms, spirillum-like. They were motionless like the bacterium lactis, but exceedingly different otherwise. Then from that I inoculated a second urine glass, and got the same appearance. From the second urine glass I inoculated a glass of Pasteur's solution, and now got an exceedingly different appearance. I got bacteria only in short pairs—and with exceedingly active movements. I then inoculated another urine glass from the Pasteur's solution, and got back my large coiled organisms; and, lastly, from this I inoculated a glass of boiled milk, and got the lactic fermentation back again as with the original milk. I had also taken the pains to examine a specimen from the Pasteur's solution mixed with urine in a glass garden, if I may so express it, in which I could see the organisms from time to time, and thought I had traced the transition of the one into the other. I was lately mentioning these facts to an eminent physiologist, who took the view that after all bacteria might be mere accidental concomitants of the fermentative changes. I mentioned these facts to him, and when I had finished my story, he said, "Well, I am convinced." I thought to myself, "Well, if I have convinced this eminent gentleman by these facts, they are worth proving more rigorously; I shall have a little time between giving up the surgeoncy in Edinburgh and going to London; I will reproduce the experiments, and this time I will do them more strictly; I will actually observe everything with the glass garden, and see from hour to hour what change does occur, and if the one organism does become transformed into the other." Accordingly I got some souring milk from the same dairy as before. I proceeded to inoculate a glass of unboiled uncontaminated urine, and also a glass of pure Pasteur's solution. The result in the urine was that, instead of getting the motionless organism, I got an actively moving double bacterium. In the Pasteur's solution, on the other hand, I got a motionless bacterium instead of the moving one.

Here, then, were the facts all wrong. What was the explanation of it? I had obviously got some accidental contamination, though I thought I had kept myself clear of the chance of such a thing. So I determined to try, if possible, to get rid of these accidental concomitants, and the way which occurred to me as a possible mode of doing this was to dilute the milk with so large a quantity of boiled, and therefore pure, water as to have on the average only one bacterium to every drop with which I might inoculate the boiled milk. If I did that, then, as the bacterium lactis was out of all proportion in enormously larger number than any other, the chances would be, so to speak, infinitely great that I should only have the bacterium lactis in every such drop, that I should exclude all others, such, for instance, as multitudes of organisms which could only develop when the bacterium lactis was excluded. Accordingly, I attempted to count the bacteria, and seemed to succeed, and, I believe, did succeed, in that particular specimen of souring milk. There happened to be two kinds of bacteria in every field. There was not only the motionless bacterium lactis, but there was also an actively moving kind of bacterium, but in much smaller proportion. I found it necessary to dilute with as much as a million parts of boiled water. Having done this, I inoculated five boiled milk glasses, and of those five only one was affected in any way. That was affected with the lactic fermentation. The others were not affected with any fermentation, nor did they show any bacteria. Therefore, presumably, we had now got the bacterium lactis pure and simple: we would work with it, and see how it would behave in other media. I accordingly inoculated urine with it, and here it is represented as it was found in the urine after two days' development, exactly like what it was in the milk. But if I had not had it by itself, I should not have noticed it at all. It grew with extreme slowness; and if I had had the other bacterium that I had before developing at the same time, this certainly would have escaped my notice, so scarce was it. After a time it came to develop still more slowly in the urine, and developed an exceedingly puny progeny, though still capable of producing the lactic fermentation.

Then I inoculated also Pasteur's solution. In doing so, I made use of a tube like this which I have called a separation tube—a little glass tube bent, with one leg shorter than the other, the shorter leg stuffed with moist cotton and purified by boiling, after which it is introduced into a pure liqueur glass. The liquid to be experimented on is then poured in not to so high a level as the top of the longer leg. The liquid finds its way through the cotton. It rises in the longer leg, and then if we inoculate the liquid in the longer leg with anything, that something will not be able to pass through the closely rammed cotton-wool, unless it be capable of development. If it be capable of development in the liquid, then it will work its way before long through the cotton-wool, closely rammed though it is. Thus we have the means of separating things which are living and capable of development in that particular liquid from things which are not living or not capable of developing there. I inoculated such a separation tube containing Pasteur's solution by introducing a little curdled soured milk—soured with pure ferment. There appeared to be for a long time no change at all. After a while, I thought the curd looked a little swollen. I took a piece of it out and examined it, and found that the curd seemed to have disappeared, and its place was occupied by small bacteria, having the characters of the bacterium lactis, showing that it had developed there; but it seemed to have developed only at the expense of the piece of curd; for, in the outside liquid, although it was kept for more than two weeks, no development whatever took place. The bacterium had not been able to make its way through the cotton. Not only so; but I inoculated directly another glass of Pasteur's solution from a glass containing the living bacterium lactis in urine. At the end of a fortnight, there was still absolutely no development. Therefore, it appears that, in Pasteur's solution, the bacterium lactis, though it is not destroyed by it, cannot develop; it has not the materials requisite for its nutrition. Therefore, I am bound to make this confession, that I appear to have been mistaken in my former experiments. Certain it is that, in these last experiments, where I took that drop from the souring milk and inoculated urine and got an actively moving bacterium, I got something accidentally concomitant with the bacterium lactis. Equally certain is it that, when I inoculated Pasteur's solution with the sour milk, I got an actively developing, though motionless, bacterium—an accidental bacterium. Now that we know from experiments how exceedingly numerous the organisms are which are liable to infest milk, we can easily understand how such contamination may have taken place.

Having got the bacterium lactis apparently pure and unmixed, I proceeded to the experiment which has been already described elsewhere. I ascertained how many bacteria existed on an average in every hundredth of a minim of milk. Having ascertained this, I knew how much boiled water I ought to add (of course, using the most scrupulous precautions against contamination) in order that every drop with which I should inoculate glasses of boiled milk should, on an average, contain one of the bacteria. Probably, there would not be absolute uniformity of distribution; therefore, some glasses would have more than one, and some would have none. I inoculated ten glasses with such drops. All of these you may say were in one sense infective drops; that is to say, drops taken from an infective liquid; but, of those drops, some only produce an effect; and, by a curious coincidence, it happened that, of the ten glasses, exactly five were affected with the lactic fermentation, and exactly five remained fluid. I have brought before the Society an example of one of the fluid glasses still remaining fluid at this long period, which, you will easily understand, must have been somewhat difficult to bring from Edinburgh here without contamination from spilling. It was, of course, very carefully nursed. There is under one of these microscopes a small drop from this glass. I examined it to-day for the first time since the examination before leaving Edinburgh. I had seen then that there were no bacteria, and I find to-day that there are none. The only alteration visible in the microscope is that the milk-globules are becoming some of them angular through the effect of drying. Here, again, is one of the glasses that underwent the lactic fermentation; and this is equally remarkable; because here, having got the lactic fermentation pure and simple, we have a pure white curd to this day just as if the milk had soured yesterday, whereas with ordinary souring milk, though we get a white curd to start with, we all know that it is soon followed up by other alterations. There is the bacterium that leads to butyric fermentation; there is the oïdium lactis that constitutes the yellow bloom upon a cream-cheese. Very likely the penicillium glaucum finds its way in, and in the course of time putrefaction takes place; but here we have the pure effect of one particular ferment, and you will perceive that, whatever little odour there is, it is a pure sour odour.

Although I have fully stated elsewhere the inference to be drawn from this experiment, its importance leads me to mention it before this Society. We have seen from the former experiments that in water the fermentative agency is in the form of suspended particles, not matter in solution; and the experiment I have just recorded with regard to souring milk proves the same with regard to that fermentation. All received equal sized drops; half only were affected with the fermentation. That shows that the ferment was not dissolved. It was, as in the case of the ferments in water, insoluble particles in suspension. Then, what are those particles? Let us assume, for the sake of argument, that it is possible that there might be chemical particles destitute of life, capable of multiplying as rapidly as the bacterium, which you may watch multiplying and see growing in souring milk, becoming doubled in the course of an hour—you can see them subdividing at that rate. Suppose, I say, for the sake of argument, you make what I believe to be an unwarrantable assumption altogether, viz.: that there might be chemical particles destitute of life, capable of self-multiplication like those bacteria—admit that as a mere hypothesis, and I say it would be inconceivable if those two sets of particles, the true ferment and the bacterium, were mere accidental concomitants; that they should be present in the same numbers; and, if you admitted that they were present in the same numbers, it would be equally inconceivable that they should always go in pairs. I went through the process of examining on the glasses; and I found that, wherever there was a glass affected with lactic fermentation, there was the bacterium lactis, and every glass that was not affected with lactic fermentation showed no bacterium whatever. Therefore, I believe it must be considered absolutely demonstrated that that special form of fermentation is due to that particular kind of bacterium.

If this be really demonstrated, it must be admitted to be a very important point. Of course, it only proves one instance; but the method, I conceive, can be applied in many other cases of fermentation.

With regard to the odour of sour milk, why should there be such a thing? The chemist would tell you that lactic acid is non-volatile, and so it is—lactic acid is absolutely odourless. If you take a specimen of milk like this, which is some of yesterday's milk from a dairy, kept near a fire to promote souring, you find a fine fragance of sour milk; but that is not the sort of odour you have from a lactic fermentation pure and simple. The smell of ordinary sour milk seems to be chiefly due to butyric acid, which is volatile; but what is it that causes the odour in our apparently pure lactic fermentation? Some other ingredient than the lactic acid. I have been at the pains to distil sour milk—soured under the influence of pure lactic ferment. I got a clear liquid, which had still more strongly the peculiar, pungent, sour odour, reminding one somewhat of acetic acid, different from ordinary souring milk; but, to my surprise this liquid had no acid taste, and did not affect litmus-paper in the least. Therefore, it was some form of ether, I suppose—some volatile substance—which, though having a sour smell is not acid. I must leave it to the chemists to investigate its nature. It has been shown by Pasteur that caramel and other substances exist as concomitants of the alcoholic fermentation of sugar; so it appears that this substance, whatever it is, exists as a concomitant of lactic fermentution.

I should like to allude, if I might, for a minute or two to this diagram, in which we have represented the bacterium lactis, after developing three days in milk diluted with twelve hundred parts of water. It will be observed that the bacterium lactis is here of extremely small size. These diagrams are all to scale, copied from camera lucida sketches. The magnifying power, as represented on the diagram, is about 300,000 diameters. You will imagine, therefore, how exceedingly minute these little particles must be. You could not well tell that they are bacteria, seeing that they are motionless, except under the circumstances in which they occur and their grouping; yet bacteria lactis undoubtedly they were. Let me compare them for a moment with this ferment, the torula cerevisiæ. What a huge organism is the one in comparison with the other. The small one is not so big in its individual elements as the mere granules in the torula cerevisiæ, yet it is an organism with the remarkable fermentative properties I have described. Now let us imagine what is surely not an improbable thing; that there may exist other organisms as much smaller than the bacterium lactis as these are smaller than the torula; and we at once get, by that very simple transition, so to speak, to ultra-microscopic organisms. This consideration bears upon pathology. It will not do for us to say that, because we do not find, for example, in erysipelas any visible organisms, there are none. There may be organisms as real, as distinct in structure as these little bacteria lactis, and producing as potent effects by their growth, though we do not happen to be able to see them with any microscope that we have, and are not likely to see them with any microscope that will ever be produced.

Then there is one other point. When the milk was diluted with 1200 parts of water, within three days the bacteria had produced this puny progeny, not half the size of those that occurred in souring milk; and I should observe that after three days the bacterium lactis in the souring milk is not so large as you see it in the first twenty-four hours. If you wish to see the bacterium lactis in the best condition, you should take a glass of boiled milk and dip into a glass of souring milk the point of a needle, and inoculate the side of the glass with it; then, within twenty-four hours, you will find the bacteria. You may search long before you find them; but, if you find one, it will be of a good size. In the course of the next twenty-four hours, they will become smaller and smaller, until at last the majority of them, affected apparently by the sour milk, become so small that you can scarcely recognize them, and they become so confused with the curd, entangled in the curd of the souring milk, as red corpuscles become entangled in the fibrine of coagulated blood, that you may sometimes fail to see them even after a prolonged search, as I fear some of you may fail in that specimen of curdled milk of some months ago, under one of the microscopes. In water, then, or rather in milk very much diluted with water, the bacteria became small. Now, that beautifully confirms an observation I made some years ago to this effect. I took tap-water and introduced it into a pure flask purified in the way I have described. I kept it forty-eight hours. At the end of forty-eight hours, when I took the flask into a dark room and put a candle on the other side, I could just discern a delicate bluish-white film, and, on examining it with a microscope, I found it consisted of closely packed motionless bacteria of extreme minuteness. They were really there in the stagnant water. Who could doubt, then, that they existed in the running water; that they existed not merely as germs in the running water, but as bacteria? Then call to mind the simple experiments with the subdivision of water into hundreds of a minim; and you remember that, in the tap-water, at least which I investigated, the fermentative particles only existed about one in every hundredth of a minim. Add to this that a hundredth of a minim, if spread out between two plates of glass, occupies a space equal to half of a square half-inch; and you will see that, if you were to search for a whole summer-day for such an individual bacterium, you would probaby fail to find it. I have gone through the experiment of actually mixing bacteria in such proportions with water, bacteria of full development and large size, and I have failed, with a patient search for hours, in discovering one of them. If to this you add that the bacteria that I saw in water were motionless and minute, I think it will be seen that to say that, because we cannot see in water existing bacteria, therefore, you must be forced to the conclusion that water contains germs of bacteria, ultra-microscopic objects, that we could not see at all even if we had them under our microscopes, is to make an unwarrantable assumption. I am aware that there are two instances, the bacillus anthracis and the bacillus subtilis, in which it is said that the actual germs of bacteria do exist. I have seen nucleated bacteria myself. I confess I have never seen things that resisted such treatment as these germs are said to have resisted in the hands of others. But even these germs are not ultra-microscopic. They are bright points that are seen—bright granules. There has never been evidence of any ultra-microscopic germ; and, as Dr. Roberts points out in his Manchester address, those two species are the only bacteria with regard to which there is anything like evidence that germs exist at all. For my own part, I think it extremely improbable that bacteria in general have germs. They are actually reproductive organs, constantly multiplied by segmentation; and, if there be any organism in existence that does not require germs, I should say it is the bacterium; but the facts that I have mentioned, on the one hand the scarcity of the fermentative particles in such water as I have examined, and on the other hand the small size the bacteria assume when they develop in water, seem to me sufficient to explain why we do not meet with them in microscopic examination. Thus I venture to say that, what appears to me to be at the present time a somewhat needless mystery in this matter, may be satisfactorily cleared away.

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.

The Relations of Pharmacy to Medical Students.*

BY JOHN EDMOND FAIRLIE.

In considering the history of the last hundred years, there is nothing which more surprises the reflective mind than the vast amount of scientific knowledge which has been gained in that, comparatively, short period. This indeed has been so great, that, utilized by what is known as the Arts and Manufactures and permeated as it is through the whole workings of society, it has produced changes which have been not only remarkable but revolutionary in the highest degree so as not only to completely remodel into a new era the manners and customs of life, but also to completely reorganize the whole scientific world.

There is no better example of this advancement and extension of human knowledge than is seen in that part of the great domain of science known as "Medicine." The consequence being that the "Medical Art," although of course still far from perfection, has become transformed and developed with such remarkable rapidity, that now it bears little or no resemblance to the mystified and grovelling art of the ancient physician.

As the amount of scientific knowledge increases, those subdivisions of science, or the so-called sciences, become multiplied with great rapidity; some of which spring into being from the study of subjects hitherto altogether overlooked, many originate in, and are evolutionized, as if it were, from the embryo of a mere trade, while others are formed as if by a process of germination from the further subdivision of other sciences. This also has been remarkably exemplified in the science of medicine, and there is no doubt but that as our knowledge extends, many further subdivisions in biological science will become necessary. In many of these cases, the subdivision is merely conventional, as no distinct line of demarcation can be drawn between them, for it is difficult to draw a dividing line between such sciences as Chemistry and Physics, Surgery and Practice of Medicine, or of Anatomy and Physiology; but the amount of matter to be treated of in each is so great, that separate and special study is an absolute necessity.

Hence, assuming an hypothetical line of separation, selecting from the great temple of science the truths necessary to illustrate the subject matter, and, searching out, both by reasoning and experiment, for new truth, we have what is in each case popularly termed a "science." In reality, the great field of science is so vast, and the span of a life so comparatively short, that, in order to unravel a little of the unknown, and to develop and improve a little of what has already been discovered, the student of science must devote an untiring lifetime to one subject alone.

In no case is this more true than in that of the great subject now treated of as "Materia Medica," in the which, even although discoveries have lately been made, which have almost entirely changed the whole system of prescribing, there has yet been all along so much vague speculation and utter contradiction among its very best authorities, that we are disposed to put the whole subject down as one comparatively crude and undeveloped. The reason of this I believe to be greatly owing to the fact that up to the present it has been overloaded with subject-matter, and its observations scattered over far too wide a field. This then may be a subject which, in the face of the rapid advance of science, demands a multiplication by branching. I hold that this is indeed necessary, and will now endeavour to point out how it could be divided into, at least, two distinct subjects. It has in reality been similarly divided, and that with great success, on the other side of the Atlantic, where, in the medical schools they have two chairs, each teaching a subject, drawn directly from the general subject of "Materia Medica," we mean those of Pharmacy and Therapeutics. Under the former I would include (1) Pharmacognosy, or the origin, properties, varieties, qualities, and the purity of medicinal substances; (2) Pharmacy itself, or the manufacture, collection, preparation of these substances, with a practical classification of their compounds and preparations. This would constitute the "Science and Art of Pharmacy," or in short, the science of "Pharmaceutics."

Under the latter I would include (1) "Pharmacodynamics," or the uses, effects, and administration in the removal, mitigation, or prevention of disease, with a classification of medicinal substances, on a clinicophy-

* Read January 4, 1878.

siological basis; (2) Toxicology, or the dangers, results of, and antidotes for an overdose of any of the more active substances; and (3) the dietetics, the hygiene, and certain mechanical operations which are most useful in treating disease. This would constitute the science and art of "Therapeutics."

It is true that the term "Materia Medica" applies equally to both these subjects as we have defined them, and a thorough knowledge of it is the basis of both. Yet I think that I have clearly shown that the practical distinction is as great as in many other cases.

Take the instance of anatomy and physiology. Here a knowledge of the animal structures is the real basis of both. Yet they are practically quite distinct, for although treating of the same materials it is under vastly different circumstances. The former (anatomy) treats of these structures in their inanimate form, the theories of their origin and development, their collection, preparation, preservation, and the handling and observing of them for the purpose of knowing them familiarly.

The latter science treats of these structures during the active performing of their functions, and all the circumstances which govern, sustain, or influence that function, whether by assisting or interfering with it in the least degree.

Similarly so is it with "Pharmaceutics" and "Therapeutics."

The former treats of medicines in their inanimate form, the theories of their origin and development, their collection, preparation, preservation, and the handling and observing of them for the purpose of knowing them familiarly; while the latter science treats of these materials during the active performing of their function on the living body, and all the circumstances which govern, sustain, or influence that function, whether by assisting or interfering with it in the least degree. The two cases may not be exactly analogous in every detail, but they are sufficiently so to show that medicinal substances, considered from a pharmaceutical point of view, on the one hand, and from a therapeutical on the other, are quite distinct.

Thus far I have endeavoured to define what we include under the term "Pharmacy," and in speaking of its relations to "medical students" I will consider, 1st. The importance and place of pharmaceutics in medical education; and 2nd. The relations of the two professions, viz., those of the physician and the pharmaceutist.

There can be no doubt but that a thorough knowledge of the materials at hand for the removal or mitigation of disease is an accomplishment both extremely useful and highly necessary to every physician. It may be true that cures have been made with coloured water, or bread pills, that the temperament of the patient has great influence in helping to remove a disease, and that belief is a great part of all cure. But if a patient is restored by any of these means alone, the affection must have been either very transitory, or existed only in his fretted imagination. In most cases where medical aid is desired, something materially has gone wrong with at least one function in the body. Now, the ideal of treatment would be to hit upon the quickest and easiest mode of restoring the order of that function. To do this successfully much more is required than the mere theory, or book knowledge, of the treatment of disease. For as in diagnosis, the more familiar we are with the structures of the body, the sooner shall we hit upon the exact one implicated; so in prescribing, the more familiar we are with the substances with which we have to deal, the sooner shall we hit upon the exact remedy indicated. Diagnosis may be the first, and certainly it is a vastly important feature in the treatment of disordered functions. But that of itself could never restore order. No matter therefore how elaborate, careful, and skilled, be our diagnosis, it availeth nothing if not accompanied by prompt, decided and efficacious treatment. I know of graduates of this university, who though passing through their classes with success and even graduating with honours, yet found the want of a practical knowledge of medicines an immense stumbling-block between them and a successful practice; while others, who though only taking a common stand in their classes, and passing for the degree with great difficulty, yet entered almost immediately into triumphant popularity, chiefly owing, as they themselves admit, to an intimate acquaintance with the nature and preparations of medicines. As in analytical chemistry the greater the practical familiarity with chemicals the greater the instinct which leads the chemist in the direction of the unknown, so in prescribing, the more of the practical knowledge of medicines that we possess the quicker will instinct lead us to the proper remedy.

Let us notice a few errors which the prescriber is apt to fall into (1) of giving nothing, (2) of giving too little, (3) of giving too much, (4) of missing the mark altogether, and (5) of giving erroneous and inelegant admixtures. Examples of these I have observed repeatedly, but I do not mention them in the least as a slight to the profession, for a man may make them all although well up in all the other parts of medical knowledge. In regard to giving the patient nothing (if it is supposed that nothing serious is wrong), it is a mistake; because as the patient believes that something is wrong he simply goes to some other doctor or resorts to some "quack medicines," whereas a little tincture of cardamoms or compound tincture of cinchona, by allaying the patient's apprehensions, might have performed a wonderful cure. In regard to giving too little it is evident that if there be a disease at all it not only does little or no good but often positive harm to prescribe too little even of the right medicine, for it only allows the disease to take its course and thus destroys the patient's faith in the physician. Many physicians while they do not openly espouse the doctrine of homœopathy, yet unconciously approach remarkably near the confines of that art. Take the following two examples, in which cases I know that the patients were decidely ill and had latterly to procure other aid. (1) For a lady about thirty was prescribed the following:—℞ Sodii Chloridi ʒvj, Aq. ad ℥vj. A dessertspoonful for a dose three times a day. (2) For a corpulent man who was disturbed with want of sleep was given—℞ Potassii Bromidi, ℈j, Aq. ad ℥x. M. sig. A tablespoonful at bedtime. In both these cases the whole bottle might have been given at once with comparatively little physiological effect. Regarding the giving of too much, this seldom happens, as it is the duty of the pharmacist to detect unusual doses, yet proof has often to be produced before the prescription is altered. This often happens from confounding the names of substances which are similar, or confounding the signs used in the writing of prescriptions. We have seen calomel prescribed as "Hydrargri Chloridi," a term which would also apply to corrosive sublimate; the dose of the latter being only one-twelfth of a grain, whereas that of the former is six grains. The sign for an ounce (℥) is often confounded with that for a drachm (ʒ), and the error of prescribing an ounce and a-half instead of a drachm and a-half of substances such as hydrocyanic acid has been made and corrected by the pharmacist. In regard to missing the mark we may reason *à priori* that it is a great blow to the success of any man, that is if the disease does not remove itself. This mistake may not only be of giving the wrong substance, but also of giving the right medicine in a form entirely unsuited in the particular case for which it is required, as it is a common occurrence for patients either to be unable to take, or have a horror for certain forms of medicine. Regarding the prescribing of erroneous mixtures I may say that this is exceedingly common. The effect of this is damaging to the interests of the physician, as I am convinced from what I have seen that a pleasant looking and elegant preparation will go a long way in helping its efficaciousness, and the apathy and disgust often evinced at the taking of ugly medicines must have a great counteracting effect upon their curative properties.

Among these I might mention nauseous oils and resinous juices not made into a proper emulsion; too large pills, powders, etc.; resinous tinctures mixed with water; substances which are incompatible, such as aromatic spirit of ammonia and syrup of squills; bringing an acid and an alkali together, and the mixing of substances which produce a disagreeable, muddy, dirty-looking precipitate, and necessitates the pharmacist sticking a label on instructing the patient to "shake the bottle," as if the harmless bottle had anything to do with the inelegant mixture,—I am disposed to suggest that the physician should get the shaking. Cases such as I have here mentioned cause the patient to loose confidence in the physician. He then takes off to some other, to some pretentious or unpardonable "quack," or what is exceedingly common, to the use of "patent medicines" or the study of 'Buchan,' or some equally ancient so-called "family doctor,'' all of which, whether by virtue of the substances used, or the captivating, highsounding, and alluring recommendations which are given with them, often perform in the eyes of the patient most wonderful cures. The failure of a number of our physicians to prescribe the "right thing in the right place" (not from want of medical knowledge, as a rule, but merely from a want of familiarity with the substances to be prescribed) has given a great incentive to, and keeps alive to some extent, the two bugbears of the medical profession at the present time, viz., prescribing by persons ignorant of the nature of disease, and that now alarmingly extensive, highly dangerous, and exceedingly ruinous system of respectable swindling, "patent medicine."

From what I have said it may be concluded that a good sound knowledge of pharmaceutics is a "talisman" of the greatest value to every physician.

In regard to the place of pharmaceutics in medical education I feel assured that it is destined to fill a higher place in the future than it has hitherto done. That place cannot be estimated at present owing to the rapid development of pharmaceutical knowledge. But there is not a doubt that it will very soon be one of the most popular of the practical classes in our whole curriculum.

The present system of an optional two months' course in summer or of taking three months in a chemist's shop, are totally inadequate and insufficient in view of the largeness of the subject.

I have had some experience of the sham of the latter arrangement, as the student knows about as much at the end as at the beginning of his term, and but that he bears away with him a certificate, which bears a lie on its face, his fee is worse than lost. Druggists have not the qualities nor experience of a teacher, and very few have time for teaching. The student is often left to find out things for himself, or is handed over to the care of the apprentice, with whom he often practises in the back shop the "noble art of self-defence," instead of hammering into his brain the details of the numerous preparations made from opium, cinchona, etc., while the medical student studying pharmacy behind the chemist's counter is often more an annoyance and a bore than anything else; further, very few of the pharmaceutical processes which are of real importance to the medical student are ever gone into in the average retail chemist's shop, such as the preparation of the alkaloids, the formation of salts, and the manufacture of substances having much intricacy in their manipulation. Our hope lies, on the one hand, in the examinations of the Pharmaceutical Society, for the elevation of the pharmacist. This Society has in the past done good service in London by establishing its School of Pharmacy, where the three branches, chemistry, botany, and materia medica, are taught to advantage; but the provinces have been neglected by this Society as well as by the various medical faculties throughout the country, and we must therefore look, on the other hand, to a systematic course of study being adopted, not only for those who have to present themselves to the pharmaceutical examinations, but also for medical students, and that in connection with every medical school in the country.

Referring to the Pharmaceutical Society, it is an examining body by law, but its students are allowed to find their education where they may. I have great faith in a systematic course of training, and I think that the medical faculties are standing in the way of true pharmaceutical progress in not endeavouring to have a chair of pharmacy established, and the attendance of the class made compulsory upon all medical students. In view of the new arrangement, now recommended for the medical curriculum in this college, of a five years' course, I think that one of the regulations ought to be that in the third year a regular winter's course of pharmacy, copiously illustrated by experiments and specimens, as a forerunner, and preparatory to the great and vital subject of "therapeutics," a course of which could be held in the fourth year. And in view of the then acquired clinical experience, and in the light of the knowledge of pharmaceutics, this universal and all-important subject might be studied with advantage and with an interest and appreciation which few medical students at the present time have any idea that it should possess for them.

Let us now consider shortly a few of the relations existing, or which ought to exist, between the physician and the pharmaceutist.

There are no apothecaries in Scotland, but in England and Ireland, the calling of the apothecaries—who were the druggists of the last century, and became fired no doubt with ambition and enthusiasm as time advanced by the numerous discoveries of modern science—has become exalted to the rank of an honourable profession. As an outcome, therefore, of the Pharmacy Act of 1868 and the standard of examinations now maintained by the Pharmaceutical Society, there is undoubtedly a glorious future in store for this new profession of pharmacy. But, as in the medical profession itself, it will be long before it will purge itself of old tradition and custom, free itself from the innovations of some of its empirical adherents, or defend the integrity of its constitution from the daring enterprises of some of its unruly and presumptuous members. In view of this state of matters, what are and what ought to be its relations to the profession of the physician, whose handmaid the pharmacist practically is? These are exceedingly delicate, and the elasticity which custom and the want of law gives to both demands an early and decided rectification. On the one hand the chemist, while he cannot ever be restricted from diffusing the knowledge he naturally acquires regarding the common action of simple medicines, or even their application in simple cases or in emergencies, is subject to a great temptation to fall into a custom of regular prescribing, simply from a desire not to refuse the requests of a good customer. This is especially the case in the poorer districts, and in the country, where the people are either too poor to pay a fee if it can be at all saved, or, ignorant of the real difference between a chemist and a doctor, they imagine the chemist to be a doctor who does not visit, who gives free advice, and yet knows as much, and in many cases gets credit for knowing more than the qualified professional man who goes about charging a fee. On the other hand the chemist has been encouraged in this, and has some ground of excuse, in the fact that there are about three doctors who keep open shop for every one chemist; this applies more particularly to Glasgow and the west of Scotland. The majority of doctors manage a shop by putting a boy or a girl in it, who knows little or nothing of the business, at a very small wage, for which reason, together with the fact that he generally has a fee in addition to his profit on the medicine, he undersells the chemist. There would not be so much room for complaint if the plan was generally adopted that is followed out by a very few, that is, simply to dispense their own medicines. But for professional men to bemean themselves, by encouraging the sale of all kinds of quack nostrums, is utterly *infra dig.*, and ought to be scouted down by all those who have the true interest of the medical profession and the good of the people at heart.

But the great bulk of surgeries, or so-called "Apothecary Halls," in this district contain a large stock of "sundries," and "patents," and the public may obtain any small quantity of medicine for the above reason, often cheaper than the chemist is able to supply them, and in many cases in these places free advice is given, charges being made merely for the price of the medicine, thus outdoing the chemist in every detail. So much so is this the case that I am confident that there is scarcely a chemist in the east end of the city, who derives more than a tenth of his income from the legitimate dispensing of prescriptions, the other nine-tenths being made up in despair by counter prescribing, pushing the sale of "patents," and the sale of common articles of stock. Some medical men, though above keeping open shop, find other ways and means of deriving a profit out of the medicine they prescribe, and I have been told that arrangements exist between some physicians and chemists whereby a percentage is allowed the doctor for every prescription sent. The physician presents the prescription to the patient in an envelope, with the chemist's name and address, remarking that that is the only shop where it can be properly made up, and even resorts to the writing of mythical prescriptions in terms which that chemist alone knows. Such prescriptions as the following are to be seen every day:—℞ Pess, No. 1, 2, 3, et 24. One as directed. ℞ Mist. Comp., ℥viii, a tablespoonful three times a day. ℞ Pil. alb. xii. The pills, etc. Such practices I would stamp as downright conspiracy against the public, and both doctor and chemist I think ought to be punished by the law. The system of counter prescribing when carried beyond ordinary bounds should be condemned with severe punishment. The system, so common in Scotland, of doctors having shops with only boys or girls in them, who cannot really have any understanding of the medicines, is so fret with danger to the general public that it also should be prohibited by law; while the system of the manufacturing and puffing in the newspapers of "patent medicines" now so enormously carried on, especially by the English chemists, is—as these are composed of nothing more nor less than the common articles of the materia medica which everybody knows—one of the best examples of respectable swindling, carried on, too, under the cloak of a christian government, ever introduced into a civilized country. I hold too that these malrelations neutralize the influence and retard the progress of both professions, and I am hopeful that the time is not far distant when purged from these evils they will live together peacefully, entwined together as elder and younger sisters, yet remaining each distinct in her own sphere. With the pharmaceutist abstaining completely from anything which would approach or in the least substitute medical advice; with the abolition of the doctor's shop and the surgery, unless when managed by a qualified chemist; with the annihilation of the whole trumpery of the so-called patent medicine, and with the members of both acting openly in the light, avoiding the darkness of conspiracy, they would rise accordingly in the honour and respect of the world; and each one performing his duty within his own sphere, with a faithfulness which is but the outcome of the truly noble soul, look far beyond the trivial opulence of mortal life for a far higher and more glorious reward.

Parliamentary and Law Proceedings.

The Angostura Bitters Trade Mark.

In the Chancery Division of the High Court of Justice, a case, Siegert *v.* Findlater, has been heard before Mr. Justice Fry, involving a trade-mark question of considerable peculiarity in its features, especially in the fact (at first sight surprising) that a part of the injunction asked for and obtained prevents the user in existing circumstances of a trade name adopted by Dr. Meinhard, the manufacturer of the offending goods, before it was taken by the plaintiffs.

The plaintiffs manufacture at Port of Spain, in the Island of Trinidad, an article which (as his Lordship held) has been for some years known and sold in England as "Angostura Bitters." The manufacture of this article is a trade secret invented by Dr. Siegert, the father of the plaintiffs, at a time when he lived at Ciudad Bolivar, on the Orinoco, the capital town of one of the federated states of Venezuela. The town was called Angostura till in 1846 it name was altered by the local legislature; the district is still known by that name, which the evidence showed, continues to be used in England and has not been erased from the plates of map publishers. Dr. Siegert, in consequence of the disturbed political state of the country, removed many years back to Trinidad, where he and his successors have ever since carried on the manufacture of their bitters in that island. Dr. Siegert's article was formerly called by the makers "Aromatic Bitters," but it acquired in England the appellation of "Angostura," and the plaintiffs now sell it in bottles of a particular size and shape in paper wrappers imprinted with advertisements and cautions against spurious imitations in four languages, and folded in a particular manner; it is designated on the wrappers as "Angostura Bitters." The present action was brought against Messrs. Findlater and Co. and Messrs. Ingliss and Wulff, who were employed by the general agent of Dr. Meinhard at Hamburg for the sale in England of bitters made by Dr. Meinhard at "Ciudad Bolivar," and sold in bottles of the same size with paper wrappers very like the plaintiffs', and folded in the same peculiar way. The action sought an injunction to prevent the sale in England so as to deceive the purchaser into believing that he was buying the plaintiffs' article. Messrs. Findlater had been dismissed the action, having at once ceased to sell, and the other defendants were defending under an indemnity from Dr. Meinhard. This is not the only litigation between the parties. An injunction was obtained in Trinidad to restrain the sale of "Aromatic Bitters" in imitation of the plaintiffs'; and, on the other hand, they failed in proceedings at Hamburg, not being able, it would appear, under the German law of trade-mark, to obtain protection for their paper wrappers.

Mr. Cookson, Q.C., and Mr. Fellows appeared for the plaintiffs; Mr. North, Q.C., and Mr. John Cutler for the defendants.

Mr. Justice Fry gave judgment at considerable length, in which he compared the points of resemblance between the rival articles as presented to the public, and came to the conclusion that, notwithstanding the names of the makers being impressed on the bottles and other slight differences, there was such a general resemblance in the "get-up" of the articles for the market that the similarity was likely to deceive a purchaser, and from that and the other evidence he must presume an intention on the part of Dr. Meinhard to obtain a sale of his goods as those of the plaintiffs. There was evidence of actual mistake. The plaintiffs' agent had discovered by taste that "Angostura Bitters" sold at the Criterion were not the plaintiffs', and the manager of that place in buying had himself been deceived. There was, he said, a question as to whether the injunction ought to extend to the use of the word "Angostura"; he was of opinion that the word had been adopted skilfully after judgment had been given against Dr. Meinhard in Trinidad to get the benefit of the use of a word under which the plaintiffs' article and no one else's was known in England. There would be an injunction to restrain, among other things, the use of that word in such a manner as to mislead; but it would not prevent Dr. Meinhard, if he discovered the plaintiffs' secret, from making an article exactly like theirs and selling it under that name; nor, if the name "Angostura Bitters" became of wider or different meaning in England, would the defendants be prevented from making and selling under that name an article properly so called.

POISONING BY STRYCHNINE.

At the Cambridge assizes on Tuesday, before Mr. Baron Huddleston, Samuel Shotliffe, a railway signalman, was charged with the wilful murder of Clara Jane Reddane, of Murrows, by inciting her to take strychnine. The deceased was sister of the prisoner's wife. She had had one illegitimate child, which was fourteen months old, and of which she alleged the prisoner was the father. Her brother-in-law stated that the prisoner had visited deceased at his house, and, according to his own version, pressed her to blame another man. She declined, and he said he was a ruined man, and she would not see him alive again. Thereupon, he said, she snatched a packet of strychnine which he held in his hand. He asked her to give it back to him, but she promised to burn it, and they parted. Shortly after deceased encountered the prisoner's wife, and there were words between them. Her death took place within four hours. In her dress pocket was found a packet, which was proved to contain nine grains of strychnine. It was proved that the same morning the prisoner purchased ten grains of strychnine, ostensibly for rat killing. He gave a fictitious name, and the chemist's daughter sold the drug without requiring him to be introduced by some one she knew. This drew forth severe remarks from the Judge, who hoped steps would be taken in that case, because had the laws been obeyed they would in all probability not have heard of this case. The prisoner said he originally purchased the strychnine with the intention of destroying himself, being overwhelmed with the disgrace which his conduct had brought upon a happy family. The jury found prisoner Not Guilty, and he was discharged.

Dispensing Memoranda.

[50]. EXT. ERGOTÆ LIQUID.—Mr. A. W. Gerrard, of University College Hospital, writes objecting to Mr. Langbeck's opinion that the crystalline deposit from fluid extract of ergot is potassium sulphate. He also states that—

"Two different deposits occur in this extract; the first is usually deposited within a month of its manufacture, consisting of distinct transparent crystals two or three lines thick, thus corresponding with the description of 'Young Pharmacist;' these crystals are soluble in water, have an acid reaction, and give all the characteristic reactions of phosphates.

"The second deposit is slower in its formation, and of a calcareous character, consisting mainly of phosphate of lime with a little sulphate; in this deposit, recently examined, minute traces only of potassium could be found, and judging from the solubility of Mr. Langbeck's barium precipitate in nitric acid, I think much lime must have been present in the form of phosphates.

"For further confirmation of my views, Flückiger and Hanbury state that the crystals found in ergot extract consist of acid phosphate of soda with a little sulphate; as to the acid they are correct, but the base is wrongly stated. Again Chevallier and Wiggers have separately analysed ergot, obtaining therefrom nearly 4½ per cent. of acid phosphate of potash, but they do not mention the sulphate."

[52]. I think Mr. H. Cumber can avoid dispensing anything so formidable as seven-grain pills. But to send out double the number ordered by a physician is unadvisable. If a patient had previously been told that twelve pills would be sent it would occasion surprise to receive twenty-four. Again, if at one house twelve large pills are supplied, and the prescription is subsequently handed to another dispenser, who sends twenty-four of a different size (and who quite possibly has no opportunity of explaining that he has only altered the form of dose), the uneasiness of the patient is naturally the result; and if the case were reversed the effect is the same. In this way confidence is lost, and too often not a little annoyance results both to dispenser and principal. If the prescription were in the first instance handed to me to be dispensed, and communication with the writer were practicable, I would ask him to write on the prescription that twenty-four pills should be made of the ingredients, and two of them be taken for a dose. That being done, each dispenser into whose hands the prescription might afterwards come would be in a fair position to merit the confidence of his principal's patron.

If, where practicable, the first dispenser of medicine having properties that raise the question of alteration in any manner would act as suggested above (though not for the first time so suggested), much trouble and annoyance would, I feel sure, be avoided.

In this instance, supposing access to the prescriber unattainable, or the prescription to have been previously dispensed, I would proceed as follows:—

℞ Ext. Hyoscyami . . . . gr. xxxvi.
Pulv. Pil. Rhei. Co. (*i.e.*, sine Theriacâ). gr. xxxii.

Make twelve pills. If well worked these are quite of presentable appearance, though smaller ones might be desirable.

S. H. P.

[54]. ℞ Creasoti . . . . ♏ ij.
Pil. Rhei Co. . . . . . . gr. ij.

This can be made into a pill not larger than a 4 gr. pill by the addition of 1 gr. of magn. calc. levis.

For ten pills:—

℞ Creasoti . . . . ♏ xx.
Magn. Calc. Levis. . . . . gr. x.
Pil. Rhei Co. . . . . gr. xx.

Rub the magnesia and creasote together, and set aside for three or four hours; it will then be hard enough to powder. Add the pil. rhei, work into a mass, and divide into ten pills.

W. WILKINSON.

263, *Cheetham Hill, Manchester.*

[54]. These pills can be easily made of a size not exceeding that of an ordinary five-grain pill. If half-a-dozen are wanted—

℞ Creasoti (by measure) . . . . . ♏. xii (12).
Pulv. Pil. Rhei. Co. (*i.e.*, sine Theriacâ) . . . . gr. viii (8).
Magnesiæ Levis . . . . ℈j.

Mix the pill and creasote well, add the magnesia, mix and roll out quickly.

S. H. P.

[54]. In answer to No. 54, I have found the following method for pills to make a nice pilular mass, and not too large.

℞ Creasote . . . . ♏ ij.
Pulv. pro Pil. Rhei Co. . . . gr. ij.
Excipt. Pulv. Tragac. Co. . . gr. iss.
Mica Panis . . . . gr. j.

Ft. pil. j.

C. W. BOTWOOD.

[54]. In answer to query No. 54 in last week's issue, "Aderyn" will find no difficulty in producing a good pill if he adds one grain each of cera flav. and pulv. glycyrrh., using an equivalent quantity of the pulv. pro pil. rhei co., instead of the mass.

A. E. C.

Scarborough.

[57]. Will any experienced dispenser kindly state the proper way to dispense the following prescription:—

℞ Tinct. Ferri Perchlor. . . . . ʒiij.
Tinct. Digitalis . . . . . . ʒij.
Aquæ Chloroformi . . . . . ʒij.
M. Cap. coch. parv. bis in die, ex semi cyath. aquæ.

Not knowing the physician or prescriber I dispensed it literally as it stands without the ad ℥ij; consequently making it ℥ij ʒv.. but I cannot think it was so intended.

BETA.

[58]. Can the following be made without effervescing, which causes inconvenience, so much so, that I have had a bottle or two burst soon after they were finished:—

℞ Potass. Iodid. . . . . ʒj.
Potass. Bicarbon. . . . . . . ʒij.
Ferri Ammon. Citrat. . . . . ʒij.
Aq. Flor. Aurant. . . . . . ad ℥iij.
M.

The quality of the chemicals cannot be doubted, as I obtained them from one of the best London houses to try to obviate the effervescing effect.

BETA.

Notes and Queries.

[574]. TRANSPARENT CEMENT.—Will some one kindly inform me how to make Transparent Diamond Cement? I have tried most of published forms, but find them all opaque.

AGGLUTINO.

[575]. CHERTIER'S COPPER.—I wish to inquire through the Journal what salt of copper is known as Chertier's Copper.

WALTER SLICER.

Obituary.

Notice has been received of the deaths of the following:—

On the 6th of December, 1877, Mr. John Priestley, Chemist and Druggist, Bradford. Aged 46 years.

On the 17th of December, 1877, Mr. Robert Lees, Chemist and Druggist, Edinburgh. Aged 74 years.

On the 19th of December, 1877, Mr. John Bennett, Chemist and Druggist, Clarence Parade, Cheltenham. Aged 61 years.

On the 20th of December, 1877, Mr. William R. Marsden Starks, Chemist and Druggist, North Shields. Aged 31 years.

On the 21st of December, 1877, Mr. James Paterson Roger, Chemist and Druggist, Rhynie, Aberdeenshire. Aged 42 years.

On the 23rd of December, 1877, Mr. Robert Robinson, Chemist and Druggist, Lockwood. Aged 75 years.

On the 27th of December, 1877, Mr. Patrick Milne, Chemist and Druggist, Arbroath. Aged 77 years. Mr. Milne had been a Member of the Pharmaceutical Society since 1870.

On the 30th of December, 1877, Mr. Philip Howman, Pharmaceutical Chemist, Winchcombe, Gloucestershire. Aged 63 years. Mr. Howman had been a Member of the Pharmaceutical Society since 1842.

On the 13th of January, 1878, Mr. Edmund Hewson Armitage, Pharmaceutical Chemist, Dartford. Aged 33 years. Mr. Armitage had been a Member of the Pharmaceutical Society since 1869.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

DEATH POINT OF BACTERIA.

Sir,—Mr. Willmott in his letter in last week's Journal claims to have determined for the first time the fact, "that bacteria and their germs were utterly destroyed when placed in a temperature of 150° Fahr. and upwards, providing that the heat were continuously applied for a period of from three to six days," and further states that "this was quite a new point in the inquiry."

I must correct Mr. Willmott with reference to this part of his subject. In 1874 a series of experiments was very carefully conducted by Leonid Bucholtz,* in the laboratory of Professor Dragendorff in Dorpat, and from the results obtained he arrived at the conclusion that bacteria were killed in a continued temperature of 60° C., equal to 140° Fahr. He kept up the temperature for three days, but states that if continued for twenty-four hours it is sufficient for the purpose.

Previously to this date no less an authority than Dr. Ferdinand Cohn had arrived at a similar conclusion, and published it in an article on bacteria in his 'Biologie der Pflanzen, 1872.'†

Whatever other merit the process may claim in destroying these obscure organisms and their germs, it lacks that of novelty.

THOMAS GREENISH.

20, *New Street, Dorset Square, Jan.* 16, 1878.

* Untersuchungen über den Einfluss der Temperatur auf Bakterienvegatum.

† Untersuchungen über Bakterien. Beitrage zur Biol, den pfl ii, 1872, s. 203, u ff.

W. Slicer.—Advertisements for this Journal should be sent to Messrs. Churchill, 11, New Burlington Street. The terms will be found in the advertising sheet.

R. E. Harrison.—Concerning chrysophanic acid ointment, see vol. vii., p. 528.

F. Shrivel.—(1) *Leucobryum glaucum* and *Hypnum cupressiforme;* (2) *Cladonia squamosa;* (3) *Cladonia uncialis;* (4) *Hypnum cupressiforme, β compressum;* (5) *Cladina rangiferina.*

"*Picrotoxin.*"—Piesse's 'Art of Perfumery.'

W. W. Morris.—Lafargue recommends to dissolve 3·6 grams of santonin in a little spirit and then add the solution to 500 grams of boiling simple syrup; 30 grams of syrup will contain about 20 centigrams of santonin.

Inferior Corks.—*W. J. F.* writes to complain of the inconvenience that results from the use of inferior corks by vendors of some of the private preparations that are required in the dispensing of prescriptions.

Mr. H. A. Thomas (Cannes).—We are much obliged to you for your communication, but you will see by a reference to the Journal for last week that the subject has already been fully dealt with.

Erratum.—On p. 559, in Dispensing Memorandum No. 53, for "Ess. Limonis ℥j" read "Ess. Limonis ʒj."

B. H.—Probably a variety of savin; we cannot tell without the fruit.

"*Student.*"—The second course of Lectures on Botany and Materia Medica commences in the first week in March and extends to the end of July. Apply at the School for a prospectus.

"*Inquirer.*"—A copy of the Regulations of the Board of Examiners may be had by applying to the Secretary, 17, Bloomsbury Square, W.C.

W. Jordan is thanked for his communication.

"*Chemist.*"—Chloral Hydrate and its preparations have been recently included in Part 2 of the Schedule of Poisons under the Pharmacy Act, 1868.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Walker, Mr. Murphy, Mr. Harrison, Occidens, Syrupus.

"THE MONTH."

The unusual mildness of the weather at this season of the year renders it a difficult task to inform our readers what they may expect to find in blossom. The winter jessamine, with its yellow scentless flowers and leafless branches, and the deliciously scented *Chimonanthus fragrans*, are sure to be seen in blossom, and possess some little botanical interest; the former on account of having generally six parts to the corolla, although it is an exogenous plant, while the other species of the genus have usually five or eight parts to the calyx and corolla, and the latter because the bracts, calyx, and corolla run so much one into the other that it is very difficult to distinguish between them, and because the wood has a microscopical structure similar to that of the magnoliaceæ. A figure and description of these plants may be seen in the *Gardeners' Chronicle* for January 19th.

The Christmas rose (*Helleborus niger*) is now in full perfection in the open air, while the orange may be seen in flower at Kew in the economic house. In the palm house a fine tree of *Cinnamomum Tamala*, one of the species from which the folia malabathri of old writers were obtained, is just coming into blossom, and a small plant of *Cassia Tora* is still in bloom.

In the country it is impossible to say what may not be found, for we find that a pharmaceutical chemist noticed at Looe about fifty wild plants in blossom on Christmas Day, among which was included the red poppy (*Papaver Rhœas*).

'Medicinal Plants' for this month contains figures of *Glycyrrhiza glabra*, *Capsicum fastigiatum*, *Andropogon Nardus*, and three British plants, viz. *Daucus Carota*, *Origanum vulgare*, *Matricaria Chamomilla*, and a double plate of *Papaver somniferum*. The figure of the white poppy is taken from a specimen of the large white-flowered form cultivated at Banbury. *Capsicum fastigiatum*, although such a well-known plant, has, according to the authors, only once before been figured by Wight, and of *Andropogon Nardus* no figure has hitherto been published. It is to be regretted that the *Matricaria Chamomilla* was not placed for the sake of comparison in part 22, in which the true camomile is figured.

In the *Comptes Rendus* for January 14, an interesting note appears from M. Jobert upon the preparation of the curare poison. He has seen it prepared by the Tecuna Indians, who, he states, compound it entirely of vegetable substances, the chief ingredients being "*Urari uva*," probably *Strychnos castelnæ*, Wed.; and *Taja*, a plant belonging to the aroideæ; a menispermaceous plant, three piperaceous, and one or two of other families complete the list. M. Jobert has already made some experiments upon the action of the plants administered separately, the results of which are not given, and intends to still further pursue his researches. Fortunately the plants used in preparing the poison have been photographed, and specimens of them will be brought to Europe by M. Jobert for exact determination.

According to the "Doctor," gurjon oil is being used with success in France for gonorrhœa. The dose recommended is not more than one drachm in twenty-four hours, emulsified by gum. It has the advantage of keeping the bowels open, in the above dose, of having a more rapid action than copaiba, and of not tainting the breath. The use of this drug for leprosy is already well known, and its use in gonorrhœa is by no means new, since it is official in the Indian Pharmacopœia for that purpose, and the reputation it has had in this country as an *adulterant* of copaiba is probably the reason why it has never been tried here as a substitute for it.

From the same journal we learn that iodoform is being used in very fine powder as an application to indolent ulcers and chancres, the powder being sprinkled over the sore, which is then covered with oil silk or gutta percha tissue. Unless the iodoform be finely powdered it is apt to irritate.

Condurango bark, which was long ago condemned as useless in this country, has been stated in the *Lyons Médicale*, by Dr. Freidreich, of Heidelberg, to have cured in his hands a case of cancer of the stomach.

In the *Philadelphia Medical Times*, Dr. Sansery recommends the use of ergotin in suppositories, four grains in each to be used, at first every night and morning, afterwards at night only. The extract known as Bonjean's ergotin is probably the ergotin here referred to.

Salicin has already found another application. Dr. Maclagan records that it has succeeded when given in large doses in cases of periodic neuralgia in which quinine has failed or could not be taken.

A singular case of poisoning of a child three years old, by bitter almonds, is recorded in the *Medical Times and Gazette*, and possesses considerable interest. Repeated vomiting was induced by means of inserting a finger in the throat after failure with sulphate of zinc; but a return to the comatose state took place after each vomiting until the whole of the almonds were ejected. As the hydrated mixed oxides of iron were administered, as well as brandy, it would seem that the relapses were due to the repeated formation of fresh hydrocyanic acid from the portion of almonds still in the stomach.

Only recently the preparation known as dialysed iron was found useful in a case of arsenical poisoning, and as it will probably take a place in pharmacy in future, and is likely to be always at hand in cases of emergency, a trial of it as a chemical antidote for prussic acid might be worth making. It may be questioned whether, in the above case of poisoning, the recovery was not largely due to the use of brandy, since all volatile poisons are eliminated chiefly through the lungs, and any means of stimulating the respiratory muscles is likely to prove the most successful antidote, for the oxidation of iron can only neutralize the portion of prussic acid which is not absorbed into the circulation and cannot influence the minute portion which by its action on the nervous system destroys life.

Dr. Squibb, at the last meeting of the King's County Pharmaceutical Society, made some remarks upon cod-liver oil, which may perhaps be of interest to some readers. He stated that he preferred the Norwegian oil to the Newfoundland oil, on account of the low temperature at which it was prepared, and also because only the very finest of that produced in Norway was exported. He further recommended the addition of ten drops of ether to two drachms of the oil as a stimulant to the flow of pancreatic fluid, which emulsifies, and thereby promotes the assimilation of the oil. He considered that one drachm of the oil three or four times a day was sufficient in the majority of cases. A five per cent. solution of gum arabic poured into a small medicine glass tended greatly to cover the taste, while some salt herring eaten just before taking the oil would render the taste imperceptible.

Chemists who have to powder podophyllin should be careful to cover the mortar in which they are powdering that resin, since in a recent number of the *Lancet*, Dr. Webster records four instances of chemists' assistants having suffered from severe inflammation of the eyes from this cause, and although treated with atropine and solution of borax the inflammation was not subdued for five days.

In the St. Petersburg *Medicinische Wochenschrift*, Dr. Sieven makes known a very simple remedy for preventing the development of boils. He states that if the skin be superficially scraped with a small knife, so that a drop or two of blood may be pressed through the epidermis as soon as the peculiar stabbing or pricking sensation and slight induration announce the commencement of the boil, it will not be further developed.

Sir Joseph Fayrer's recommendation in the *Medical Times and Gazette* of Indian bael at the present moment is singularly ill-timed. The fruit is unripe in the autumn, and therefore not procurable in that state at this time of year, nor is diarrhœa particularly prevalent at this season. Remedies for diarrhœa are numerous, but those for skin diseases comparatively few, and the fact that chrysophanic acid has met with success in this country is no reason why unripe Indian bael should do so.

Whooping cough, the dread and plague of childhood, has lately been successfully treated by Dr. Pattee, by the new remedy for asthma, *Grindelia robusta*. It is stated to have cured thirty cases after three or four days' treatment, ten drops or more being given every two hours. Thus another remedy has been added to the long list of those which have been found occasionally successful in this disease, although none of them can be said to have been invariably so.

Several medicines have been recently tried with a certain degree of success in epilepsy. Dr. Vallender, of Braunweiler, has found subcutaneous injections of apomorphia to prevent attacks, and bromide of zinc has been used successfully in France for the same purpose; while Dr. Gillman, in America, has found opium uniformly successful in the same disease.

A new therapeutical use for glycerine has been discovered by Dr. Young, of Florence, who administers doses of two teaspoonfuls in water, morning and evening, for hæmorrhoids.

Professor W. H. Thomson reports that one part of capsicum to three of quinine, or one part of ginger to one of quinine, increases the action of quinine by one half, with the additional effect, when capsicum is used, of sometimes purging violently.

Thymol appears to be attracting some notice, and the demand for it is increasing. For internal administration two, three or more tablespoonfuls a day are given of a solution containing 1 part in 2000, and afterwards of double the strength. For external use an aqueous solution of 1 part in 1000 is usually sufficient; but for offensive wounds a stronger alcoholic solution is recommended. The saturated aqueous solution is capable of arresting lactic fermentation, and arrests excessive secretion by mucous membranes.

Formic acid is also said to possess powerful preservative properties, exceeding, when added to acid solutions, even carbolic acid, and to be particularly suitable for adding to fruit juices; from one quarter to one half per cent. is the quantity requisite to preserve vinegar, fruit juices, glue, ink, etc.

In the *Répertoire de Pharmacie*, M. Catton reports meeting with samples of santonin containing 22·5 per cent. of boracic acid. After the accidents which have happened owing to the presence of strychnine in samples of this drug, it is not surprising that it should be carefully examined; but the appearance of so large an amount of another adulterant could hardly have been expected. It illustrates, however, the well-known fact that thieves often neglect the simplest precautions.

In the *Pharmaceutische Zeitung*, Prollius gives a very simple method for assaying opium. The drug is exhausted by water, the solution evaporated, and the residue dissolved in alcohol of 30 per cent. strength in such proportions that one part of opium is represented by ten parts of the solution. Fifty parts of this tincture, twenty-five of ether, and one of stronger solution of ammonia, are shaken briskly together, and allowed to stand for twenty-four hours. The liquids separate into two layers, the morphia collecting gradually at their line of contact in fine crystals, which coalesce into a crust, and sink to the bottom. The coloured liquids, containing narcotine, etc., are poured off, and the crystals washed with a very little dilute alcohol, dried and weighed. This process is not only one of the simplest yet proposed, but is said to give very good results.

The very much worked subject of the principles of ergot has evidently by no means been exhausted; Professor Dragendorff announces that the body which he named Sclerythrin, is not a simple body, but is resolvable into three bodies, sclerythrin, picrosclerotine, which is a bitter alkaloid, and fuscosclerotic acid, a yellowish brown substance.

A method of removing the disagreeable odour of petroleum has been published by Mr. E. Masson; 100 kilograms of petroleum are placed in a suitable vessel and 60 grams each of concentrated sulphuric and nitric acids poured into it through a long necked funnel, and finally 500 grams of alcohol are carefully poured on the top of the oil. As soon as the latter sinks to the bottom and comes into contact with the acids, it develops heat and causes effervescence from boiling. The petroleum assumes a yellowish colour, and after having remained in contact with the acids and alcohol for about an hour it is gently agitated with water, and after about ten hours decanted.

An ingenious idea has recently been carried out at Pesth. A deep artesian well has been sunk with the view of supplying the city with an unlimited supply of warm water for the public baths, etc. Already 175,000 gallons, at a temperature of 161° F. stream out daily from a depth of over 3000 feet, and rise to a height of 35 feet. It is intended to continue the boring until a temperature of 178° is obtained. Still more ingenious is the device of using the water rising from the well as a motive power, which drives the drills at a rate of speed double that previously obtained at the mouth of the well. The value of a supply of a water of this kind, not merely for baths, but in case of fires, cannot be over estimated.

In America a further proposed application of the heat contained in the earth is to use the hot air from mines as a means of warming houses and public buildings, the ventilation of the mine being accomplished at the same time.

Dr. Squibb, of Brooklyn, has recently published, in pamphlet form, his opinions concerning the practicability of a universal pharmacopœia. He has at last come to the conclusion that the design is premature, and for the present age impracticable. So far as an international pharmacopœia, which shall take the place of all other pharmacopœias and render them unnecessary, is concerned, it is quite possible to agree with him and to believe not only that the standard of medical education is not high enough to admit the radical changes which such a work would necessitate, but that it will never be.

The second idea of a universal pharmacopæia, which aims to embrace only the making of preparations or compound medicaments of a uniform strength and character, leaving the national pharmacopæias as necessary as ever, but in accord in regard to the strength and quality of the agents of certain classes of remedies that have been long and commonly used in different nations by the same or similar names, and to have them designated by the same name everywhere, is, he thinks, just as difficult to carry out. But the chief value of an international pharmacopœia would be to prevent accidents owing to variation in strength of powerful medicaments, such as hydrocyanic acid, tincture of opium, solution of strychnine, etc., and an international agreement as to the strength of all powerful medicines, the preparation of these being reduced in number, and the synonyms in various countries being appended to each, seems not only possible but probable.

The cultivators of science whose names and achievements will be recorded in 1878 are already at work, and they will have to work hard to ensure results that will compare favourably with all that was attained by the workers of the year that is now no more. The past year saw the discovery of certainly one new element, gallium, and the existence of another, davyum, was rendered probable, not to mention lavoisium, of which little has been heard since its rumoured discovery.

Then again, before the interest attaching to the radiometer had subsided, a new object of a deeper importance was discovered in the telephone, and while the admiration called forth by the development which has waited so promptly upon the discovery was at its height, chemists heard of the liquefaction of oxygen, hydrogen, and common air, thereby substantiating views long since maintained, and of late years more particularly supported by Andrews' experiments upon the continuity of the liquid and gaseous states. Big things have therefore been accomplished in the past year, but these must not be regarded from a too confined point of view. As the molecule is made up of atoms, and as oceans are but the accumulations of drops, so every important discovery is preceded by a number of newly discovered facts, every generalization and every law are but the expressions of perfected details previously ascertained. And fortunately for science, this persistent labour is continual and ever increasing, and to a large extent the scientist is not influenced by those changes which so materially affect most other avocations in life. It is true that to some extent war and revolution exercise a disturbing influence upon science and scientific men, and this may under circumstances become a large amount, but compared with the disturbance to which for instance commerce is subjected by such a state of things, it is after all insignificant. Here and there, in particular countries, science may suffer vastly, but commerce is liable to receive an universal check, something near to a complete stagnation.

While therefore the year which has just commenced may not witness the achievement of things so great in themselves as those of the past year, much may and will be done with what may be called brick-making, the making of those parts which, by a skilful hand or a cunning brain admit of the combination into huge structural generalizations and laws.

Since the last reference to the subject of the liquefaction of the gases, considerable progress has been made by Messrs. Cailletet and Pictet, the latter of whom has communicated to M. Dumas the information that he has succeeded in solidifying hydrogen. The result was no doubt especially agreeable to M. Dumas, who has always regarded hydrogen as a metal and who so long ago as the time when his 'Traité de Chimie' was first published, spoke of hydrogen as a gaseous metal.

The hydrogen employed by M. Pictet was prepared according to the method recommended by Berthelot, of decomposing potassium formate by caustic potash, which yields very pure hydrogen. The compression of the gas was commenced at 8·30 p.m. on the 9th inst., and gradually increased; in the space of rather more than half-an-hour the pressure was equal to 650 atmospheres; it then remained the same for a few seconds and on opening the stop-cock, the hydrogen escaped in the form of a liquid jet, having a steel blue colour. This jet suddenly became intermittent, and a hail of solid particles fell with a crackling noise upon the ground.

The stop-cock was then closed again and the pressure, amounting to 370 atmospheres, gradually fell to 215 atmospheres, remaining stationary at this point for a few minutes and then rising to 225. Upon opening the stop-cock, the jet was very intermittent, and in all probability this was due to the solidification of the hydrogen.

Another interesting result arrived at by M. Pictet is that relating to the density of liquid or solid oxygen, by which he confirms the views of M. Dumas, that it should be the same as the density of water.

In a lecture upon the coal tar colours, recently delivered at the London Institution, Professor Armstrong took occasion to recall the anticipation put forward by Professor Hofmann, in his report upon the chemical products in the Exhibition of 1862, where, in speaking of the inauguration of this industry in England, he remarked that this country "might before long send her coal-derived blues to indigo-growing India, her tar-distilled crimson to cochineal-producing Mexico, and her fossil substitutes for quercitron and safflower to China, Japan, and other countries whence these articles are now derived." There was, to some extent, ample ground for this anticipation, since the raw material from which these colours are derived is produced in far greater quantity in Great Britain than on the continent; but although the coal tar obtained from gas works in this country still constitutes, as it has hitherto done, the chief, if not quite the exclusive, source of the aniline colours, their manufacture has been to a great extent transferred to Germany and France. For some years past the benzol naphtha used in this manufacture has been exported from England to France and Germany, while the colours there produced from it have been brought back from thence to the markets of Manchester, Bradford, and Glasgow.

This fact stands in striking contrast to the statement of Professor Armstrong, that the manufacturers of England do not attempt to employ skilled chemists, and it is at the same time a practical satire upon their shortsightednesss.

The same result has been experienced in the artificial production of alizarine, another product of coal tar. Almost the whole of the anthracene from which this substance is produced comes from England, and the mode of producing it was discovered here at the same time as in Germany. Still the Germans buy English anthracene pretty well at their own price, they make it into alizarine, and are able to rule the English markets for it, as to quality and price.

Here are two remarkable illustrations of the decay of British Industry which are well deserving of consideration, since they may serve to explain how it is that similar tendencies are to be observed in other and more important branches of industry. How is it that the manufacture of the coal tar colours has drifted away from this country, notwithstanding the fact that English manufacturers had the command and almost a monopoly of the raw material as well as the advantage of such protection of the methods of production as the patent law affords ? Professor Armstrong suggests that the reason is that English manufacturers do not employ skilled chemists, and no doubt it must be admitted that this circumstance is an immediate reason why they are outstripped by German and French manufacturers. There must, however, be some more potent influence behind, for the inability to cope with foreign manufacturers is not even remedied by the employment of foreign chemists, and that it is not impossible to obtain skilled chemists at home has certainly been rendered unquestionable by the history of the very industry now referred to. Nicholson, Perkin, and Greville Williams have sufficiently demonstrated the capacity of Englishmen in that direction. But, says Professor Armstrong, there are so few chemists in England who have had the requisite training, and there is no school where instruction is given in the particular kind of chemical work that is required. Admirers of South Kensington and its works will not perhaps admit the latter statement if they do the former, and many others will still feel the want of a more satisfactory explanation of the evil now referred to than can be afforded by any assumed national defects in teaching power or learning capacity.

In regard to this subject, however, there is a difference between the classes engaged in productive industry in this country and in Germany especially. In the one case it is rare to meet either with masters or men who possess any scientific knowledge of the manufacture they are engaged in, while on the continent it is as rare to find a factory without the assistance of several persons well versed in those branches of science which relate to its particular industry. As a rule there is a wholesome appreciation of the value of science, not as a thing to be dallied with and admired at an evening gathering of idle folk, but as, in the case of chemistry for instance, being the mainspring and very essence of the power by which many technical operations are carried to a successful and profitable issue. Until those engaged in productive industry acquire such an appreciation of science and, in place of ignorant denunciation of what they term theory, they seek the aid of science in a proper spirit, it will be but natural that the training of the chemist should be lop-sided, that the majority of those who take to its study should run to seed in the vain pursuit of perfect structural formulæ and remain for ever destitute of any practical utility to manufacturers, whose business is slipping from them by reason of their deficient knowlege of the art by which they live. Whether, as suggested by Professor Armstrong, our universities are responsible for this state of things, and whether there be any ground for hoping they could mend it, are questions which would lead too far from the limits within which these pages must be confined.

Among publications to hand this month is one on the presence of certain metallic impurities in the materials employed in the manufacture of aërated waters, by W. Ivison Macadam. The author discusses the well-known fact that when the parts of the machinery employed with which the gas comes into contact are constructed of lead instead of pure tin, they become sources of lead contamination.

But Mr. Macadam dwells particularly upon the materials used in the compounding of lemonade, viz., tartaric acid, citric acid, sugar, and oil of lemons. He finds that many samples of tartaric acid contain lead, an average of four specimens showing the presence of 0·021 per cent. An average of four samples of citric acid showed the presence of 0·0045 per cent., while four specimens of soft sugar contained on the average 0·000255 per cent. of lead. Clear crystallized and loaf sugars showed the presence of much less lead, about ·0006 per cent. as a mean quantity. The oil of lemons derives its metallic impurities, including lead and copper, from the metal cases in which it arrives in this country, as long since pointed out in this Journal by Dr. Stevenson Macadam. The action is insignificant so long as the oil is pure, but by its contact with air, acetic acid is produced slowly, and this then acts rapidly upon the metals, thus introducing the deleterious ingredients.

From a table constructed by Mr. Macadam, it is shown that the use of quantities of the materials sufficient to yield one bottle of lemonade introduces into this aërated water no less than 0·00691 grain of lead, a quantity which he considers far too great to be taken with impunity. Of course, a great quantity of lemonade contains no lead at all, but it it liable to be contaminated with this poisonous metal when proper precautions are neglected and such materials are employed as have been described.

Some little time ago Messrs. W. M. Hamlet and C. B. Plowright called attention,* and gave furthur substantiation to a view previously held by some chemists to the effect that many fungi contain oxalic acid (in the form of hydropotassic oxalate or calcium oxalate) as a common constituent. They showed that various specimens of *Peziza venosa*, Pers., a large number of *Hymenomycetes*, *Lycoperda* and *Sphaeriæ* gave a strong acid reaction to litmus paper, and that *Fistulina hepatica* particularly exhibited the same reaction, and on analysis this last named specimen proved to contain 0·083 per cent. of free oxalic acid. Subsequently the presence of oxalic acid was detected in very many species of fungi.

More recently Messrs. A. Downes and T. P.

* *Chem. News*, xxxvi, p. 93.

Blunt* have pointed out that a solution of oxalic acid of decinormal strength when freely exposed to sunlight for some time is entirely destroyed, so that oxalic acid cannot be detected in the solution, and this observation is confirmed by Mr. W. N. Hartley† who states that in every such instance of decomposition he has found the mycelium of a fungus in the liquid, and hence he has attributed the change to some action exerted by the said fungus. Although Mr. Hartley's supposition is probably correct, the facts elicited by Messrs. Hamlet and Plowright, which have been above described, show that the subject is one well worthy of a further inquiry. It should be stated, however, that Messrs. Downes and Blunt do not share Mr. Hartley's view.

The *Philosophical Magazine* for the current month extracts an interesting article from the *Comptes Rendus*, by L. Cailletet. The author has collected the gases circulating in the hottest parts of the furnaces in which iron is worked, and the results of his analyses differ from those previously obtained by Ebelmen, who being unacquainted with the phenomena of dissociation did not take into consideration the influence towards re-combination presented by cooling of the gases

L. Cailletet's analysis is as follows:—

Oxygen	13·15
Carbonic Oxide	3·31
Carbonic Acid	1·04
Nitrogen (by difference)	82·50
	100·00

After cooling, by traversing a long flue in contact with the walls of boilers, the gas presented the following composition:—

Oxygen	7·65
Carbonic Oxide	3·21
Carbonic Acid	7·42
Nitrogen (by difference)	81·72
	100·00

The increase in carbonic anhydride is explained by the further combustion of a quantity of finely divided carbon, which is found in the atmosphere of the hearth furnace. Cailletet believes it is possible to utilize the large quantity of combustible material which ordinarily leaves the chimney with the cooled gases.

By placing iodine in contact with ozone at a temperature of 44° to 50°, Ogier‡ has obtained iodous acid, which is a pale yellow light powder, decomposable by water with the deposition of iodine. On the other hand iodic acid is apparently obtained when ozonized oxygen acts upon iodine vapour, or when a mixture of iodine vapour and oxygen is exposed to the silent electrical discharge. This iodic acid is a colourless body, and soluble in water without decomposition. It was accompanied by what appeared to be hypoiodic acid, a body less soluble in water and with characters reminding of the hypoiodic acid described by Millon.

It has been already noticed in this Journal that to avoid prosecutions for selling under strength, publicans are adopting the plan of labelling bottles containing spirits sold at their establishments, so as to show approximately the percentage of alcohol contained in them. It was reserved, however, for Mrs. Brown of Haydon Bridge to endeavour to protect her husband against the myrmidons of the law by protesting that the "grey hen" from which an inspector wished to have whisky (it was fifty-four under proof) was reserved for her husband's use to keep him sober! It is to be feared that Mrs. Brown is not improving upon acquaintance.

While treating of publicans (and sinners) attention may be drawn to a case of prosecution for alleged adulteration of beer with salt, reported in the *Brewers' Guardian* for the 8th inst. This case will be found particularly interesting not merely as regards the matter in question, but also as an exhibition of the way in which it is thereby shown analysts exhibit both ability and charity in the witness box.

The *Brewers' Guardian* also calls attention to the tenacity of life in bacteria, which are there said to be unaffected by tar, camphor, carbolic acid, chloroform, boiling heat and freezing cold. They may also rejoice for days in strong solutions of nux-vomica, opium, and chloral, and laugh sulphate of iron, mineral acids and chlorine to scorn.

In relation to this subject it may not be out of place to point out in connection with the recently lauded doctrine of contagium vivium, that it has been fairly well established by Panum, Burdon Sanderson, and others, that bacteria and other germs are innocuous so far as they are themselves concerned; they possess merely the power of initiating certain decompositions of albuminous and other substances under given conditions, which decompositions result in the production of septic poisons. The point may be deemed a fine one, but it is an all important one when viewed in connection with the subject of disinfection.

C. Neubauer* has made some interesting observations upon the concentration of wine must by means of cold. In certain of his experiments he exposed a sample of "Neroberg" must, of the year 1875, to the freezing action of Medinger's ice-machine. Before freezing it showed on analysis the following composition:—

Specfic gravity	1·0925
Sugar	18·34 per cent.
Extractive Matter	22·97 per cent.
Free Acid	0·735 per cent.
Nitrogen	0·0442 per cent.
Ash	0·322 per cent.

The following analyses exhibit the composition of wine obtained from the Neroberg must concentrated by cold (that is by the removal of ice), and of wine obtained from the thawed ice.

	Concentrated Wine.	Thawed Ice.
Specific gravity	1·0644	—
" " of the Wine without Alcohol	1·0785	—
Alcohol, per cent.	1·55	4·40
Free Acid, per cent.	8·13	0·45
Sugar, per cent.	13·94	·00
Extractive Matter, per cent.	18·33	1·456
Ash, per cent.	0·693	0·125

These results appear to indicate that the process of concentration by freezing and removal of ice might be profitably applied to vintages of a weak character.

* *Chemical News*, xxxvi, p. 279.
† *Chemical News*, xxxvii, p. 9.
‡ *Comptes Rendus*, November 19, 1877.

* *Landw. Versuchs, stat.* xx, 105–112.

Latschinoff* has studied the oxidizing action of potassium permanganate upon cholesterine. This substance, which is ordinarily viewed as a monatomic alcohol ($C_{26}H_{43}HO$), occurs largely in brain-substance and biliary calculi, and it is also found in the fat extracted from the fleece of sheep. When heated with pentachloride of phosphorus it is known to yield the derivative $C_{26}H_{43}Cl$, and by oxidation with chromic acid oxycholic acid ($C_{26}H_{40}O_6$) is produced. Latschinoff describes three different acids whose salts he has separated by the use of different solvents; these acids are: cholesteric acid, $C_{26}H_{42}O_4$; oxycholesteric acid, $C_{26}H_{42}O_5$; and dioxycholesteric acid, $C_{26}H_{42}O_6$. These results require confirmation, and indeed the whole chemistry of cholesterin particularly calls for investigation, the more so on account of its well defined crystalline character and its apparent connection with biliary substances.

Dr. Zuelzer has shown that the chlorine in urine exists partially as chloride of potassium and not merely as chloride of sodium, and that under conditions of excitement of the system the quantity of sodium chloride is diminished while that of the potassium salt is augmented; under conditions of depression the reverse obtains.

Gorup-Besanez† has published a further research upon the juice of vetch germs. From his own previous work and that of other chemists it was rendered probable that during the germination of the vetch the albuminous substance forming the reserve-matter of the seed splits up into products of hydration, and among others leucine and asparagin had been detected. Gorup-Besanez now finds that these substances are accompanied, as was to be expected, with glutamic acid and probably tyrosin. The author prepared a blue crystalline glutamate of copper having a composition indicated by the formula $C_5H_7CuNO_4+2\frac{1}{2}H_2O$; the water of crystallization is lost at 140°.

Polyporic acid, with the empirical formula, $C_7H_9O_2$, is the new acid which Stahlschmidt‡ has obtained from several species of *Polyporus*. It is insoluble in water, and gives well-defined compounds with the alkalies forming purple-coloured solutions. By heating the potassium salt with zinc powder, benzene is produced.

Among recent American patents, one by Isaac Mayer of New York is of some interest, having for its object the obtaining of a superior machine tallow by a quick, cheap, and convenient process. This consists in cutting up raw animal fat into slices or blocks, which are treated in a wooden vat with dilute nitric acid of 2° Baume; after from 30 to 48 hours' standing, the liquor is poured off and the fat exposed to boiling in an iron vessel for about half an hour, stirring meanwhile. On then placing the fat under water, the fibrous parts deposit, while the layer of fatty matter is drawn off or otherwise removed. The deposit is said to constitute a good food for pigs, while the tallow is clearer and of a superior quality, and incidentally all obnoxious odours are avoided.

Domeyko§ has given the name Bolivite to an oxysulphide of bismuth which he has found in Bolivia; it is composed of the sulphide Bi_2S_2 and the oxide Bi_2O_3. He has also found Taznite, a chlorarsenate and chlorantimonate of bismuth, at Tazna in Bolivia.

* *Bull. Soc. Chim.*, xxvii., 456.
† *Deut. Chem. Ges. Ber.*, x., 780—782.
‡ *Annalen der Chemie*, 1877, clxxxvii, p. 177.
§ *Comptes Rendus*, Nov. 19, 1877.

In reviewing the Dispensing Memoranda for the past year, it is satisfactory to note the increasing interest shown in the several subjects brought under discussion, and at the same time it is an agreeable duty to recognize the valuable assistance afforded by so many correspondents who, while freely giving their own experience, render considerable service by the suggestions offered.

No. 50 is the first number in rotation. The crystals found in some samples of Ext. Ergot. Liq. may be either acid phosphate of potassium or sodium, depending on the relative quantity of phosphoric acid to those bases existing in the ergot. That sodium and potassium are present in ergot is evident from the analyses which have been made, and this may account for the statements made on the one hand that the crystals are acid phosphate of potassium, and on the other that they are acid phosphate of sodium. In the tables of ash analyses by Dr. Wolff, there are two of ergot of rye, of which the following are copies—

	K_2O	Na_2O	CaO	MgO	Fe_2O_3	PO_5	SO_3	
Ergot from Rye	17·92	11·77	1·24	2·00	·70	58·66	—	in 10 part of ash.
Ergot from Rye	19·14	14·19	2·00	3·28	.70	53·88	—	

Probably the relative proportions of sodium and potassium would vary in accordance with variation in the constituents of the soil. The soil of one district where rye is grown may be more rich in potash than that of another, and some samples of ergot would in consequence have more or less potash accordingly. This view is borne out by a reference to twenty-three samples of ash analyses of rye, grown in different localities, quoted by Dr. Wolff, the relative quantities of potash and soda differing very greatly, whereas that of phosphoric acid is tolerably constant. Substantially the same results appear in tables given in Watts's 'Dictionary,' vol. i., under "Cereals."

It will be observed that in the analyses of the ash of ergot there is no sulphur, and in the ash of the rye the proportion of SO_3 varies from ·18 to 2·9 per cent. The crystals may therefore be acid phosphate of potassium in one sample, and that of sodium in another, or the two may be present in the same sample. Thus the statements of those who have examined crystals from various samples may be reconciled with some published statements apparently in contradiction. The ash of one sample of Ext. Ergot. Liq. examined yielded no trace of sulphate.

51. In this prescription the dose of Ext. Ergot. Liq. is called in question. The communication on the subject is not very clear. The physician when applied to is said to have stated that he very frequently gave the liquid extract in ℥j doses "as per prescription." The prescription very clearly states ℥ss of the liquid extract for a dose, and the question must be understood to apply to the prescription as written. Medical men attending cases of midwifery, often give ʒij of the liquid extract every quarter of an hour, to check that hæmorrhage which now and then follows labour, and there would be no hesitation in giving larger doses if the circumstances seem to demand it. ℥ss doses have been given in critical

cases—an emergency demands bold and prompt action. Accoucheurs generally take with them a supply of liquid extract of ergot, and large doses are therefore rarely met with in prescriptions although recognized in medical practice. It must be admitted however that a ℥ss dose is unusual in a prescription and it very properly attracted the attention of the dispenser.

52. The readers of the Journal are asked whether they would have sent out seven grain pills in a prescription. The prescription and its directions are clear and distinct (ft. pil. cap. j. h. s. s. mitte xij), with the exception of the last "s," which, being preceded by "cap." is unnecessary. Probably the prescriber had no idea of the size of a seven grain pill, and if convenient he should be referred to, if not, the pills may be made up seven grains each, and a note should be sent with them to the effect that the pills as written were larger than those usually prescribed, but if it were desired they could be divided so that two should represent the dose. Something to this effect would place the dispenser right in the patient's estimation, and at the same time would not compromise the medical man. Very large pills are sometimes made and sent out without a remark of any kind being thought necessary.

53. A lotion similar to this has been commented upon on a previous occasion. A separation will take place on the addition of the spirit of rosemary or any other spirit. If it were possible to make spirit of rosemary without spirit, probably the end in view would be accomplished, or if correctness be sacrificed to appearance by making the rosemary with a little oil of rosemary and water, such a separation will not take place. The first-class London house comes to the front again, but the dispenser may rest assured that if the lotion was sent out from such an establishment a separation did take place.

54. Creasote pills are very troublesome to make when the creasote is in excess and they require a little variation from the usual method of making pills with the ordinary ingredients. However, in this instance a very satisfactory pill may be readily made by adding half a grain of magnes. calc. to each minim of creasote, rubbing them together and allowing the magnesia and creasote thus mixed to stand in a mortar for a few hours, when the creasote and magnesia become a comparatively dry powder; the rhubarb pill may then be added and mixed as usual. A little time may thus very profitably be spent in determining the best proportion of magnesia to the creasote and the time necessary to accomplish its solidification.

55. It has been stated before in these columns that salicylic acid is nearly insoluble in water, a clear solution cannot be made with this prescription. There being only a small quantity of salicylic acid, probably the better plan would be to dissolve it by heat in half the quantity of water ordered in the prescription, and the chlorate of potash in the other half, mix them together, and add the spirit of juniper. Let the bottle be occasionally shaken, while the mixture is cooling, and again when it is cold, the recrystallized acid will be tolerably diffused, and there will be little difficulty with the divided doses.

56. Bread crumb is not a proper excipient for phosphorus, which oxidizes so rapidly that the mixture inflames. Perhaps the writer of the prescription may not have been aware of this difficulty, and the dispenser should bring it under his notice. Place the phosphorus in a mortar and dissolve in a few drops of bisulphide of carbon; when completely dissolved, add ℈j ol. theobromæ, rub this with the dissolved phosphorus, and when thoroughly mixed add ℈ij of bread crumb; manipulate quickly, and a very satisfactory pill will be the result. Bisulphide of carbon will be found the best solvent of phosphorus for pill masses, but care must be taken that the excipient is of a proper kind to prevent the oxidation of the phosphorus. For this purpose ol. theobromæ is very suitable.

57. It is difficult to determine what the writer of this prescription may mean, but what he writes is clear, and there being tr. digitalis as one of the ingredients, its presence suggests caution with regard to any alteration that may increase the dose of that ingredient. If the writer could be referred to, that course would be desirable, otherwise the prescription as written must be adhered to. Doubt may very properly be entertained as to whether the prescriber intended the tr. ferri perch. and tr. digitalis to be made up with aq. chlorof. to the ℥ij, or whether there should be ℥ij aq. chlorof. in addition to the ʒv of tincture. If the writer cannot be referred to, the dispenser has no safe alternative, he must make it up exactly as written, more especially as the error, if it be such, on the part of the writer leans towards the lesser dose.

58. If a reference be made to the characters and tests given in the formula for ferri am. cit. in the Brit. Ph. it will be seen that it should *feebly* redden litmus paper. Such an effervescence as described by this correspondent is inconsistent with ferri am. cit. B. P. standard.

A deviation from the B.P. standard lies at the root of the greater number of the difficulties which engage these columns. The excessive alkalinity on the one hand, or the extra acidity on the other, apparently trifles in themselves, when combined in a prescription disturb the balance and cause endless trouble. It cannot be too frequently repeated that it is incumbent on every pharmacist, whether he makes his own preparations or supplies himself from wholesale establishments, to see that they correspond to the characters and tests of the British Pharmacopeia.

An illustration will be found in the case reported on page 599, of the way in which persons with suicidal tendencies will evade the protective regulations of the Pharmacy Act and set at naught the care of the chemist.

BIRDS AND BERRIES.*

During the last few months certain trees have been observed covered with fruit, often in very large quantities. Many were early robbed of their produce, while others remain untouched even at the present time. The greedy way in which birds cleared off many varieties of the smaller native or hardy fruits and berries, to the total exclusion of others, although belonging to the same genus or species, is worthy of remark. This peculiarity was first observed during the autumn in the case of the berries of most of the varieties of the service or white beam trees. During September and October trees of all sizes were covered with fruit, which was rapidly taken off by blackbirds and thrushes, often before it was thoroughly ripe. Of one variety, however, viz., the *Sorbus torminalis*, which has brilliant crimson fruit, not one berry was meddled with till the end of December, and then only a few, as clusters of them are still plentiful on many of the trees.

* Read by Mr. James McNab before the Botanical Society of Edinburgh. From the *Garden* for Jan. 19, 1878.

The common red rowan tree berries were likewise cleared off in a few days during the month of September. At the present season, as well as all through December, the yew trees formed a great resort for birds, the red berries being greedily eaten by them, so much so, that besides passing a considerable quantity of pulp and seeds, which lay plentifully on the ground around, the branches were in many cases covered with ejected masses of crimson pulp. It seemed as if the berries were no sooner down the throats of the birds than they were immediately thrown up, always mixed with the small green nuts which are embedded at the end of the fruit. The Irish yews (*Taxus hibernica*) were this autumn loaded with fruit, and it was remarkable to see the manner in which the birds clung to their upright branches. While the yew berries last scarcely a holly or thorn seems to be meddled with.

Birds would appear to avoid certain fruits, the colours of which are different from those to which they have been accustomed. As I have stated, the rich crimson fruit of the *Sorbus torminalis* is avoided, although ripe at the same time as the other service tree berries, which are of a yellowish tinge, spotted with red, and these are eaten. The two varieties may even be seen side by side, the yellow bared, and the crimson untouched; but whether this is on account of the colour alone or because of a difference in flavour I am unable to say. The berries of both, however, are pleasant enough to the taste. This selection of certain fruits is also applicable to the fruit of the yellow-berried holly, which is found thick on the bushes during a severe winter when all the red berries are gone. Birds also seem to avoid the yellow-berried yew, yellow-berried mountain ash, and the black-fruited thorn, few of the fruits of these being touched till the common coloured kinds are gone. In this district of Scotland we have few ripe white berries on the mistleto this year, most being green, except in some very favourable situations. I find amongst the large bunches sent at this season from England, that although many berries are ripe and plump, numerous others are seen in the transition state from green to white. One can scarcely fancy that the mistleto berries are sought after by birds for the sake of food alone. It is evident that birds have an object to accomplish with regard to them. While eating the fruit, the extremely adhesive substance surrounding the seeds causes them to adhere firmly to the bills of the birds. In order to get rid of this foreign substance, recourse is had to rubbing their bills on the branches of neighbouring trees, and in this way the seeds are left sticking to the branches, where they afterwards take root and grow. This method of distributing mistleto seeds seems to be assigned to them by nature, as it is impossible for such seeds to grow in soil. We have just now several young mistleto plants growing on some out of the way branches, evidently two or three years old, in positions in which birds have taken refuge to get their bills cleared of the glutinous substance, and seeds adhering to them. A similar practice is adopted by cultivators when propagating the mistleto, viz., by bruising the adhesive pulp surrounding the green central germ with the fingers, and fixing it on the bark of a tree, to which it readily adheres. In order to prevent birds removing the green germ, which they frequently do, it is necessary at times to cover the germ with a piece of fine wire gauze netting or muslin, keeping the muslin tight over a piece of wire previously adjusted. The sea buckthorn (*Hippophæ rhamnoides*) is another indigenous fruit-bearing plant, which this year is fruiting in its native stations in the greatest abundance, the fruit clustering like that of the holly, but of an orange colour, the leaves being narrow and of a glaucous ash colour. This buckthorn it now very generally cultivated in many of the sandy districts of East Lothian. Perhaps the largest native tract of this plant is to be seen on the "Sandy Hint," at Tynningham Point, where a great extent of the ground is covered by a dense thicket of this shrub, varying from four feet to ten feet in height, and all in fruit-bearing condition, contrasting well with the hollies and thorns, which are also abundant in the district. I wrote to Mr. Lees, who was long gardener at Tynninghan, to ascertain if the berries of the buckthorn were eaten by birds, like those of the other native fruit-bearing plants. In answer to my question, he stated that he never saw them much frequented by birds till all the fruits of hollies and of thorns were exhausted. During the severe winter of 1860–61, when birds were sorely pressed for food, blackbirds, thrushes, and bullfinches might have been seen in flocks upon them; but although they ate the berries, he did not think they were very fond of them. Mr. Lees adds that it is rare to see the buckthorn fully covered with fruit two years in succession. Although the buckthorn succeeds in cultivation, it is rare to see more than one or two dozen berries on cultivated bushes in any one place away from the sea. While on this subject I may state that the distribution of many fruit-bearing plants, particularly in some districts of Scotland, is chiefly through the agency of birds, many such plants as yew, holly, thorn, elder, and mountain ash being found in quite inacessible places on the hill sides.

RHEUM PALMATUM, VAR. TANGUTICUM.*

BY PROFESSOR BALFOUR.

I have received from Mr. G. P. Regel, Director of the Botanic Garden at St. Petersburg, five young rhubarb plants, under the name of *Rheum palmatum*, var. *Tanguticum*. The plant was collected by Lieut-Col. N. Prejevalsky, on the north-western range of mountains of Mongolia, in the Tangut country and in the solitudes of Northern Thibet. It is rare in the environs of Chertinton, but is said to abound near the source of the Tatung and Etsina, further to the west. It is known to the Mongols as "Shara-moto," or yellow tree, and to the Tangutans as "Djumtsa." The leaves of the plant are described as large, sometimes two feet long by three feet broad, and resemble those of *Rheum palmatum*, which has been cultivated in the Botanic Garden since the time of Dr. John Hope, Professor of Botany in Edinburgh, and who read a paper on the subject to the Royal Society. The leaves, however, differ from those of *R. palmatum*, in being covered with longish and stiff hairs.

The flower stalk is said to attain a height of from seven to ten feet, with a thickness of half an inch near the ground. It does not branch, as in ordinary rhubarbs, but is more compact, the flowering branches coming off at a very acute angle, and running parallel to the stalk, as shown in the figure in the colonel's book. The root, when fully grown, is said to be about a foot long, and of the same thickness. The flowering time is the end of June or beginning of July, and the seeds ripen towards the end of August.

The Tangutans and Chinese dig it up in September and October. It is transported by land in winter and by boats in summer down the Hoang-ho to Pekin, Tientsin, and other ports, where the Europeans buy it, paying six or ten times more than its value at Sining.

The plant is quite distinct from *Rheum officinale*, which has lately been introduced into European gardens as the true rhubarb of commerce. According to Lieut.-Col. Prejevalsky, the plant yields the Kiakhta, or Khan-su rhubarb. Professor Maximovitch states that the dried roots (about 36 lbs.) brought home by the colonel, after having been carefully analysed and tested by Russian chemists and physicians, entirely agreed with the best Kiakhta rhubarb, both in internal structure and in the number of crystals of oxalate of lime, the quantity of extract obtained from the root, and in the medicinal effect of the powder, and other preparations.

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* Read before the Botanical Society of Edinburgh. From the *Transactions*.

The Pharmaceutical Journal.

SATURDAY, JANUARY 26, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE REGULATION OF PHARMACY IN VICTORIA.

IN April last,* we were enabled by the courtesy of a correspondent to place before our readers a *résumé* of two Acts that had been passed by the legislature of Victoria for the regulation of the practice of pharmacy, and the sale and dispensing of poisons in that colony. We have now received official copies of these Acts, which will be printed in an early number of this Journal for purposes of reference. With them have also come to hand the regulations of the Board of Examiners established under one of these Acts, and as this is the first legislation of the kind that has taken place in the Australian colonies, we have turned with some amount of curiosity and interest to see how these Regulations may compare with those of the Board of Examiners in Great Britain.

The control of the examinations is vested in the "Pharmacy Board of Victoria," consisting of a President and six other members, who are also to have the assistance of a Registrar. The members of the first Board were appointed by the Governor in Council without previous election, and are to continue in office three years; but the future members are to be themselves registered pharmaceutical chemists, and are to be elected by registered pharmaceutical chemists. The members of this Board are empowered to select three of their own number or three other suitable persons to act as examiners.

Only one title is created by the Act, that of "pharmaceutical chemist;" but the use of chemist and druggist, pharmacist, and other similar names by unregistered persons is prohibited. To obtain this title, except by those whose rights are preserved, it is necessary to pass the "Preliminary" examination, and others in materia medica, medical botany, practical chemistry, and practical pharmacy; to have served for not less than four years as an apprentice in the business of a registered pharmaceutical chemist, chemist and druggist, or homœopathic chemist, keeping open shop for the compounding and dispensing of prescriptions for legally qualified practitioners; and also to have attained the age of twenty-one years.

The subjects of the Preliminary examination are Latin, English and Arithmetic, and with respect to the first two the requirements are exactly the same as in the regulations for Great Britain. The arithmetic, however, goes no further than the first four rules, simple and compound, and vulgar and decimal fractions; while simple and compound proportion, and the metrical system of weights and measures, which occur in our syllabus, are omitted, though the metric system is included in the subsequent practical pharmacy examination.

The examinations in materia medica and medical botany and practical chemistry are not to be conducted by the Board, but are to be passed at the University of Melbourne, or at some school or college of pharmacy recognized by the Pharmacy Board, where the candidate must have attended at least one course of lectures. How far these examinations must be carried, and whether they will most resemble the corresponding portions of the Major or of the Minor is not defined, and must be left for inference.

The syllabus of the practical pharmacy examination is very similar in its terms to the portion of the Minor examination in this country included under the sections Prescriptions, Practical Dispensing, and Pharmacy. It includes, too, the more special portion of the chemistry section, so far as relates to the recognition of the ordinary chemicals used in medicine, the possession of a practical knowledge of the processes by which they are produced, the composition of such as are compound, and the ability to explain the decompositions that occur in their production and admixture. It is specially mentioned that the candidate must be able to spread plasters with dexterity and neatness, and he is also to be examined with regard to his knowledge of poisons and antidotes.

It will appear from the foregoing that the examinations properly carried out would be a test fairly equivalent to the Minor in this country, with the extra stringency of four years' apprenticeship, instead of three years' service as in this country, and the compulsory attendance at a course of lectures. We think the pharmacists of Victoria are to be congratulated that after a struggle prolonged through several years they have attained this measure of success and right heartily do we hope that the new Acts will be found to work beneficially. But we cannot help expressing the regret that the title "pharmaceutical chemist" has been again appropriated for use by persons passing an examination which must necessarily, however well conducted, be a test of the lowest measure of qualification considered to be consistent with the public safety. In Great Britain, the title of pharmaceutical chemist has come to mean more than this, and we believe that no inconvenience would have followed, whilst the highest interests of pharmacy would have been served, had the title been reserved in all English-speaking countries as a recognition of more than an ordinary amount of pharmaceutical knowledge and skill.

* See vol. vii. p. 859.

It will be remembered from our former *résumé* that the Pharmacy Board was authorized to issue licences to sell poisons to suitable persons living in places distant at least four miles from any city, town, or borough, and in which no registered pharmaceutical chemist resided. The Board, acting under its powers, has issued regulations as to the manner in which such persons are to conduct their business. The poisons are to be kept in a cupboard with sufficient shelves and divisions to keep each description of poison in a separate division. This cupboard, on which the word "poison" is to be conspicuously painted, is not to be allowed to remain open or unlocked, whilst the holder of the certificate is to keep the key in his own possession and is not to be allowed under any pretence to delegate the opening of the cupboard and the handling of the poisons to any other persons.

By the terms of the Act the Board is empowered to receive, in lieu of the examination, the certificates of the Pharmaceutical Society of Great Britain and of any college or board of pharmacy that it might decide to recognize. The recognition has now been extended to the Pharmaceutical Society of Ireland, the Schools of Pharmacy of France and Belgium, and the Colleges or Universities of Germany, Denmark, Sweden, Russia, Norway, and Austria.

THE MEDICAL ACT (1858) AMENDMENT BILL.

On the first night of the session, Dr. Lush gave notice of his intention to apply for leave to bring in a Bill to amend the Medical Act of 1858. This he did on the following evening, when the Bill was read a first time, and ordered to be printed. Although the Bill has not yet been issued among the Parliamentary Papers, we have been favoured with an inspection of a draft of it, and are able to say that it contains nothing to which chemists and druggists need raise any objection. It contains no clause similar to that in the first Bill, introduced under a similar name last session, as to the infliction of a penalty upon unregistered persons who should practise medicine or surgery for gain, which at that time created so much excitement amongst chemists and druggists, but it resembles more closely the second Bill, which was introduced after the withdrawal of the first. The second reading of the new Bill is fixed for the 20th of February.

EXAMINATION RESULTS IN GERMANY.

When referring to this subject in a recent number of the Journal, the remark was made that the comparatively small proportion of failures in the pharmaceutical examinations might be attributed to the candidates having, previously to an eighteen months' course of theoretical university lectures, served a three years' apprenticeship in a dispensary and its laboratory. An esteemed correspondent, Dr. Schacht, of Berlin, thinks that this is liable to mislead, as not stating the whole of the case, and he kindly supplies the following additional particulars:—

The young candidate for the honour of becoming a German pharmacist has first to show that he has the requisite scientific training and has passed two or three years of study at a German university; then to serve a three years' assistantship, half of which at least must be passed in a German pharmacy; then to attend the university during at least three semestres, the whole occupying from 6½ to 7½ years. Moreover, as every German is a soldier, the young pharmacist has also to serve one year under arms or as a pharmacist in a military hospital. So that practically a period of eight or nine years is taken up by a candidate in getting the education and scientific training requsite to enable him to pass the State examination.

FIRE AT A CHEMIST AND DRUGGIST'S.

A few days since, on the 8th inst., a fire broke out on the premises of Mr. Sadler, a chemist and druggist, living in George Street, Tamworth, which illustrates the great necessity that exists for the exercise of caution when dealing with some of the substances that find their way into a chemist's premises. A boy employed in the shop had poured out from the stock can a pint of benzoline required for a customer, and whilst attending to some other business, left it standing for a few moments upon the floor in a small tin. This, Mr. Sadler, entering the room just afterwards, kicked over, and the vapour of the liquid becoming ignited by the fire in a stove close by, a serious conflagration followed. We regret to say that Mr. Sadler was seriously burnt about the head and neck, and that probably some months will elapse before he will be able to return to business.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association will be held at 17, Bloomsbury Square, on Thursday evening, January 31, at 8 o'clock, when a paper will be read by Mr. J. G. Sangster on "Common Salt, its Manufacture and Uses."

CHEMISTS' ASSISTANTS' ASSOCIATION.

We are informed that by the kind permission of the Council of the Quebec Institute a Soirée in connection with the above Association will be held at 28, Baker Street, on Wednesday evening, February 27th. Further particulars will be announced shortly, and tickets will then be issued.

Transactions of the Pharmaceutical Society.

PRELIMINARY EXAMINATION.

A meeting of the Board of Examiners for England and Wales was held in London on Wednesday, January 23, 1878.

Present—Mr. Williams, President, Messrs. Allchin, Barnes, Carteighe, Gale, Martindale, Moss and Taylor.

The undermentioned Certificates were received in lieu of the Society's examination:—

Certificate of the College of Preceptors.

Morris, Henry W. G. ....Charlbury.

Certificate of the Royal College of Surgeons of England.

Greenwood, Samuel ....Sheffield.

Certificates of the University of Cambridge.

Callaway, George Frederic ......Ipswich.
Quiller, Charles Turner ....Kingston-on-Thames.
Wiggin, John Chinery............Ipswich.

Certificate of the University of Oxford.

Matthews, Henry Rouse.........London.

The report of the College of Preceptors on the examination held on January 7 was received.

Three hundred and thirteen candidates had presented themselves for examination, of whom *one hundred and ninety-two* had failed. The following *one hundred and twenty-one* passed, and the Registrar was authorized to place their names upon the register of Apprentices or Students:—

(Arranged alphabetically.)

Adams, Amos ....Barnstaple.
Adams, Henry George............Maidstone.
Adams, Walter......................Harrow.
Agar, Ralph ....West Hartlepool.
Baker, Alfred Francis ....Ashbourne.
Baker, Frederic Ekins ....Leicester.
Barrett, Arthur Albert ....London.
Bayley, Joseph Benjamin ......Birmingham.
Birks, William Cyril ....York.
Bowen, Thomas William.........Swansea.
Brown, William Charles ....Coventry.
Buckham, William Thomas ...New Shildon.
Carr, John Walter ....Barnsley.
Clixby, Arthur ....Gainsborough.
Coles, Arthur ....Uxbridge.
Collett, Thomas William.........Ingatestone.
Connochie, William .. ..Selkirk.
Cooke, Stephen......................London.
Cornish, John Robert ....Wokingham.
Davies, Arthur William ....Hay.
Davies, Richard ....London.
Deeks, William...... ....Shanklin.
Diack, Alfred Matthew ....Aberdeen.
Dodsworth, Martin ....Harrogate.
Duckering, Richard .. ..East Barkwith.
Eland, Lawrence ....Leeds.
Ellison, George Reed ....Whitby.
Elmitt, George ....Lincoln.
Elston, David ....Red Hill.
Etheridge, Alfred..................Cheltenham.
Evans, Thomas......................Chorley.
Evans, Thomas................. ...Llandyssul.
Evans, William Thomas ....Brecon.
Eyre, Frederic James ....Ilfracombe.
Featherstone, Wm. Barltrop ...Birmingham.
French, Hermann ....Milton-next-Gravesend.
Gaudie, James Garden ....Barrow-in-Furness.
Gradidge, James Henry ....Truro.
Haden, William Cresswell ......Grantham.
Hare, George Edward ....Nottingham.
Hay, John...........................Wishaw.
Haynes, Alfred Ernest ....Leamington.
Henshall, Harry ....Lymm.
Heron, Frederick Chambers ...London.
Hersant, Milton ....London.
Hislop, James ....Ellon.
Hodgson, Charles Wilson ......Kendal.
Huggins, Samuel .... Barnet.
Hughes, William Blain ....Whitehaven.
Hutton, Thomas Walter.........Dudley.
Johnson, Benjamin Pitt ....Ludlow.
Johnson, Frederick E.............Hull.
Johnson, William.. ....Liverpool.
Jones, John Evan..................Treherbert.
Kemp, James ....Aberdeen.
Kerman, William Shuttleworth.Lincoln.
Keyworth, Charles Wesley ......Cannock.
King, William Bealby ....Gainsborough.
Knaggs, Charles M. Robert ...Upleatham.
Knight, Alfred Percy ....Bath.
Knowles, Edwin ....Bolton.
Legerton, John Stock ....Braintree.
Levy, Harry ....Landport.
Lewis, James William............Pontgarreg.
Lupton, John Arthur ....York.
Lyons, Wilkie Cuthbert ....Monmouth.
McGibbon, Charles George......Liverpool.
McRitchie, David..................Inverness.
Marshall, James Robert ....Alfreton.
Matthews, George R. ....Amble.
Meadowcroft, James ....Bury.
Micklem, Edwin ....London.
Mills, Charles Thomas............Shipston-on-Stour.
Millward, Rowland Donne ......Ashbourne.
Moir, James ....Leith.
Morecroft, George ....Knutsford.
Moreley, Thomas John ....Beverley.
Morris, James Henry ....Pembroke Dock.
Morris, William Arthur ....Bath.
Mowatt, John Rodman ....London.
Munro, Edwin James ....Edinburgh.
Nicholson, Thomas Goddard ...Diss.
Noble, Alexander..................Glasgow.
Noble, Henry Edward............Peterborough.
Peacock, George ....Heslerton.
Pickering, Charles Edward......Stockton-on-Tees.
Prentice, Herbert Samuel ......Ipswich.
Rainbow, William Ballard ......Coventry.
Randall, Augustus F. Percy ...Wareham.
Richardson, Charles Bloomfield.Chesterfield.
Rigby, Walter ....Blackburn.
Roberts, Edmund..................Upper Norwood.
Roberts, Hugh ....Liverpool.
Rodmell, John Gale ....Rochester.
Rutherford, F. Arthur ReginaldBristol.
Sanders, Henry John ....Landport.
Scammell, William Joseph ......Adelaide.
Schofield, John William ....Morpeth.
Sheehan, William ....Royston.
Shepherd, Frank ....Malton.
Shuttlewood, Willie Brewin ...Leicester.
Skyrme, Henry Edward ....Cardiff.
Sloan, Robert Coulthard ....Penrith.
Smith, Robert ....Edinburgh.
Smith, Samuel Henry ....Leamington.
Stafford, Robert ....Nottingham.
Stevens, Thomas ....London.
Stenhouse, James..................Edinburgh.
Talbot, William Widdowson ...Bulwell.
Templeman, George ....Southwell.
Thresh, Arthur ....Buxton.
Tunley, William ....West Bromwich.
Walden, J. Edward Goode......London.
Watson, Arthur John ....Great Bridge.
Watts, Robert ....Sheffield.
Williams, Thomas ....Carmarthen.
Williams, William Wilfred......Haverfordwest.

Wilson, David W. Richard......Thirsk.
Winson, Anthony Arthur ......Alfreton.
Wood, John Ridal ....Rotherham.
Worfolk, Alfred Egbert ....Knottingley.

The following is a list of the Centres at which the examination was held, showing the number of candidates examined at each centre and the result:—

	Candidates Exa-mined.	Passed.	Failed.		Candidates Exa-mined.	Passed.	Failed.
Aberdeen	10	3	7	Leicester	7	2	5
Barnstaple	2	2	0	Lincoln............	9	3	6
Berwick-on-Twd	1	0	1	Liverpool	6	3	3
Birmingham......	16	5	11	London..	47	22	25
Bristol	3	2	1	Lynn...	1	0	1
Cambridge	5	0	5	Macclesfield......	4	0	4
Canterbury	4	1	3	Manchester	15	5	10
Cardiff	4	3	1	Newcastle-on-T.	2	2	0
Carlisle............	6	3	3	Northampton ...	1	0	1
Carmarthen	8	5	3	Norwich	6	2	4
Cheltenham	3	1	2	Nottingham......	15	9	6
Chester............	1	0	1	Oxford	1	0	1
Colchester	3	1	2	Peterborough ...	2	1	1
Darlington	9	4	5	Plymouth.........	3	0	3
Doncaster.........	2	2	0	Portsmouth	5	3	2
Dorchester	1	0	1	Preston............	10	3	7
Douglas, I. of M.	1	0	1	Reading	3	1	2
Dumfries	2	0	2	Scarborough... ...	3	2	1
Dundee	4	0	4	Sheffield	10	4	6
Edinburgh	14	5	9	Shrewsbury	1	0	1
Glasgow	11	2	9	Southampton ...	3	0	3
Hereford	3	2	1	Swansea	4	2	2
Hull	6	2	4	Taunton	2	0	2
Inverness	1	1	0	Truro	2	1	1
Leamington	7	4	3	Worcester	1	1	0
Leeds	16	2	14	York..............	7	5	2

The Questions for examination were as follows:—

First or Preliminary Examination.

January 7th, 1877.

Time allowed: Three hours for the three subjects).

I. LATIN.

1. Translate into English:—Eodem die castra promovit et milibus passuum sex a Caesaris castris sub monte consedit. Postridie ejus diei praeter castra Caesaris suas copias transduxit et milibus passuum duobus ultra eum castra fecit, eo consilio uti frumento commeatuque, qui ex Sequanis et Aeduis supportaretur, Caesarem intercluderet. Ex eo die dies continuos quinque Caesar pro castris suas copias produxit et aciem instructam habuit, ut, si vellet Ariovistus proelio contendere, ei potestas non deesset. Ariovistus his omnibus diebus exercitum castris continuit, equestri proelio quotidie contendit.

2. Parse the words *die, castris, passuum, consilio, supportaretur, dies, aciem.*

3. Decline together—*id consilium, equestre proelium, acies instructa, idem dies.*

4. Write out in full the perfect and future indicative of the active voice of *duco, conclamo, habeo.*

5. Write out the declension of the relative pronoun, *qui;* and state the rule for the agreement of a relative pronoun with its antecedent.

II. ARITHMETIC.

6. Multiply 704745 by 615; and subtract the product from that obtained by multiplying 1174575 by 2214. Write down the answer in words.

7. What is the value of 2475 yards of cloth at 13*s*. 10½*d*. per yard? How many coins worth 1*s*. 6½*d*. each would pay for it?

8. What is the income corresponding to an income tax of £13 2*s*. 6*d*. at the rate of 7*d*. in the pound?

9. Simplify $\frac{4\frac{1}{7}-2\frac{1}{4}}{6\frac{1}{2}-2\frac{1}{7}}$.

10. Express £3 11*s*. 9¾*d*. as a decimal of £1, and also of £2 10*s*.

11. A room is 26 ft. by 35 ft. How much will it cost to cover it with carpet 2 ft. 4 in. wide, at 4*s*. 5*d*. a yard?

III. ENGLISH.

12. Name the parts of speech, and give a definition of each of them.

13. Which of the pronouns are declinable? Write out these in full.

14. Parse the following:—

"An idler is a watch that wants both hands,
As useless if it goes as when it stands."

15. Write a short composition on one of the following subjects:—Snow, music, travelling, competition, the Suez Canal.

NORTH BRITISH BRANCH.

The second meeting of the present session took place on the evening of the 17th inst., Mr. J. B. Stephenson, President of the Branch in the chair. The meeting was a very large one, many of those present being unable to find seats.

Dr. Andrew Wilson, of the Edinburgh Medical School and University of Glasgow, delivered a highly interesting lecture to the members on:—

The Beginnings and Relations of the Nervous System.

Dr. Wilson said, that the remembrance of the kindly welcome he obtained from the members of the Society on the occasion of his last lecture induced him to send an affirmative reply to the Secretary's request that he would lecture before them this session. He had chosen for his topic a subject which might in one sense be regarded as a continuation of his previous subject, and would invite their attention to the consideration of the questions, "How does the nervous system originate in animals?" and "Are the nervous acts of the lowest animals related to those of higher forms?" The nervous system, Dr. Wilson defined as that whereby the living being was brought into relation with its surroundings. When we touched a table, for example, we were enabled through the contact of our nerves with the object, to form ideas regarding its shape, size, hardness, etc. Even in the act of thought, exercised, it might be, apart from visible movement, we were bringing ourselves into relation with the world and our surroundings, either as regards the known past, the expectant present, or the unknown future. It was evident, the lecturer maintained, that the origin of a nervous system was only to be ascertained in quarters where nervous acts and other functions of life were to be seen and observed in their primitive simplicity of detail. The simplest acts of life were exhibited by the *Protozoa*, or lowest animals, whose bodies consisted of "protoplasm"—a term which, Dr. Wilson said, had given origin to not a few controversies that had ranged far afield into the domain of metaphysics, or into that of religion itself. An *Amœba*, or "Proteus Animalcule," occurring in stagnant water, or in infusions of organic substances, was a minute speck of protoplasm. It nevertheless fed itself, reproduced its species, and maintained relations with its surroundings as perfectly, when regarded in relation to the wants of its existence, as the highest animal. When a particle of food touched the margin of its body, the protoplasmic substance was stimulated in some fashion by the contact, and was protruded so as to engulph the food particle. Here, Dr. Wilson maintained, we had the beginnings of sensation. That the animalcule "felt" the contact, was an undoubted fact, and that it acted on "information received" was an equally plain inference, which the absence of "consciousness" did not invalidate in any way. Dr. Wilson described plainly and in a most interesting manner the nervous acts of a *Medusa,* or jelly-fish, as representing an animal of higher grade than the *Amœba*—the lecturer throughout the discourse illustrating his remarks by cleverly executed sketches on the blackboard. The *Medusa* had no demonstrable nervous system, but that impressions were conveyed in direct lines from the periphery or outer parts of the body to the central parts was evident from the motions of the central mouth. This mouth turned unerringly to the side of the body which was touched, and when the connection between the mouth and outer parts was partially destroyed, the mouth moved erratically in consequence, if the margin of the body was irritated. The insect's nervous axis was next described as leading to the idea of a defined nervous system, whereby impressions made on the outermost parts of the body were conducted in clearly marked channels—the nerves—from well-defined portions of the outer surface—sense organs—to internal parts. Proceeding to consider the question of the origin of the nervous system, Dr. Wilson maintained that it was not only conceivable but highly probable that the beginnings of nervous acts originated in impressions which were made on the outside parts of a living being of lowly grade, and which affected internal parts. The chief condition required to produce this result was that the body of the organism should consist of a highly contractile substance, capable of being stimulated by impressions from without. Such a substance was well exemplified by protoplasm. Suppose that a particle of food touches the periphery or margin of an amœba's body, contraction is seen to follow, and the food-particle is engulphed. This contraction and the subsequent act of nutrition are the direct results of the contact of the food-particle with the sensitive protoplasm of the body. If we imagine further that as development proceeded, these impressions became transmitted in definite lines from the periphery to the centre, we should reach the stage of the jelly fish, in which, although definite nervous tissues are unknown, nervous impressions travel in well-defined tracts. In these tracts in higher animals, nerves are developed. Similarly out of a still higher development of the relation between outward impressions and their mode of transmission internally, the defined nervous tissues of the highest of animals might be reasonably supposed to originate. In the protoplasm of plants, nervous impressions were transmitted slowly on account of the presence of cell walls—in other words, because of the discontinuous nature of the protoplasm. The proposition the lecturer submitted to his audience, was, that a nervous system originated from the interaction taking place between the contractile tissues of lowest organisms and impressions derived from the outer world; and in support of this proposition, Dr. Wilson asked his audience to study the development (1) of the eye, (2) of the ear, and (3) of the nervous system generally of vertebrata. The eye was formed by an ingrowth of the outer surface of the embryo, meeting with an outgrowth of the brain. The ear was formed in a similar manner, although some physiologists maintained that in the ear the nervous outgrowth was of much more limited extent than in the case of the eye. Thus the outer surface of the body participated in the development of both eye and ear; and if development, as every one believed, was to be taken as a clue to the origin of animal structures and of animals themselves, then it was clear that eye and ear alike simply represented modifications of an outer surface which had originally received impressions directly, and which, through development had come to assume complex relations with the interior and with the subsequently developed nervous system. Similarly, when we study the development of the chief nervous axis of vertebrata we find that the brain and spinal cord arise from the *epiblast* or outer layer of the embryo, part of which becomes folded inwards during development to form the great nerve centres. Thus, again we see how the outer surface, originally the receiving surface of impressions, becomes modified and related to internal parts. If part of the outer layer of protoplasm in the amœba became infolded, and still maintained connection with the exterior of the body, and if we further suppose that the infolded part assumed dominance over the actions of the animal, we should have imitated the action taking place in vertebrate development, and through which the originally sensitive outer layer of the vertebrate's ancestors became folded inwards to form the nervous system. Dr. Wilson concluded a lecture which was listened to with great interest, by an allusion to the deductions which might be drawn from his subject. He might, if he chose, lead his hearers into the domain of metaphysics and of theology by asking them to consider questions connected with free-will and necessity, and other matters bearing upon what he might call the "religion" of the nervous system. But he would only ask his hearers to regard one phase of the question before them, namely, that relating to automatism. This condition, Dr. Wilson held was the original state of the nervous system of man, as indeed it represented the sole condition of the nervous acts of most lower animals. Man had developed "consciousness," or the knowledge of self, how, Dr. Wilson would not profess to say; although he did not consider the development of consciousness a whit more extraordinary than the evolution of other and explicable phases of nervous action from lower states, lower nervous acts. And if his hearers objected to the doctrine of evolution as he had applied it to the explanation of the manner in which nerves arise, he would only say that in rejecting this doctrine they threw overboard the only feasible explanation of the origin of nervous acts that was known, or that was open to free and scientific discussion. A writer had well said that if evolution had shown us that man was descended from lower animals it was the duty of religion to point out that we were now different from these lower forms; and he commended that thought to the earnest consideration of his audience.

Dr. Stevenson Macadam, who was present, expressed his admiration of the clear, lucid, and eloquent lecture his colleague, Dr. Wilson, had delivered. Many might not wholly agree with the lecturer's statements; but all would agree that Dr. Wilson's remarks had opened up a suggestive train of thought.

On the motion of the President, a cordial vote of thanks was awarded to the lecturer.

Dr. Wilson in acknowledging the compliment remarked that he was pleased to see so large an attendance at these meetings of the profession in Edinburgh. He would not like to think that the large attendance was wholly due to Mr. W. L. Howie's paper on the "Telephone," but in any case he would commend the heads of the profession to influence their *employés* to attend these meetings, at which much information and instruction were presented to their notice. These meetings had his best wishes for their full success.

The Chairman then called upon Mr. W. L. Howie, who had promised to let the members hear something of the telephone.

Mr. Howie said that from allusions which had been made that evening, he was afraid that the expectation of the meeting had been raised too high, he simply contemplated bringing before them this wonderful instrument, a form of which he had constructed during the evening leisure of the Christmas holidays, and in a conversational way say a few words regarding its history and construction, and if the conditions were favourable, let each one in the room have an opportunity of hearing the telephone speak and sing. Mr. Howie then proceeded to describe the history and construction of the telephone as follows:—

The word "Telephone" indicates the use of the instrument, meaning literally far-sounder, or far-speaker, as the Germans have it, and I daresay that there is no one here so oblivious of recent scientific advancement as the old lady who thought a telephone was "a thing for sherpin rāāzors."

Although the speaking telephone is a recent invention, a Professor Page succeeded so long ago as 1837 in producing sounds at a distance by means of electricity; but to Philip Reiss, in 1861, belongs the honour of demonstrating that sounds of varying pitch—in other words, music—could, so to speak, be sent by telegraph. Reiss's instrument was not a speaking instrument, as you will be able to judge from the results to be obtained from a simple adaptation of Reiss's idea which I have here. Before showing it in operation, I would in a few words refer to the "thread telephone," which may be made from a couple of two-ounce willow boxes, the bottoms of which are replaced by gut-skin or parchment paper, stretched while wet, and held in position by the rim of the lid. A linen or other non-elastic thread connects the two diaphragms through a pin hole in the middle, and if these boxes be now taken apart till the thread is stretched, a whisper spoken into the one is distinctly heard in the other. This thread telephone is good for the distance the thread can hang free and straight, and the voice is reproduced quite distinctly; but the transmission of the sound is simply mechanical, the vibrations of the one membrane being communicated along the thread directly to the other. In this toy, sold in the streets for a penny, you have a striking illustration of the capacity of a vibrating membrane or diaphragm to reproduce articulate speech. A piano string when it vibrates produces a simple sound, whose pitch varies according to the speed with which it moves, the lowest note audible to the human ear being produced by sixteen vibrations per second of time, and from this we rise to very many thousands; but a diaphragm can not only give a simple sound, but chords, which are produced by two or more notes sounded simultaneously.

How this can be is not easily comprehended at first, but if I may liken the diaphragm to a placid pool of water into which a stone has been dropped, a wave circle is at once seen to spread over its surface, and if two stones are dropped in some distance apart, the waves from each cross and interlace and do not seem to interfere with each other, and so if a handful were cast in. The vibration of a diaphragm is not simply a to and fro motion, over its whole surface, but rather a succession of waves, and thus by the adoption of this form for the articulating part of the telephone, Professor Bell has produced an instrument capable of reproducing by the simplest means all the varying tones and qualities of the human voice. The speaking telephone invented by Professor A. Graham Bell, such as I hold in my hand, consists essentially of a vibrating disc, and a magnet and wire to communicate these vibrations. When the disc, which is of iron, vibrates or moves to and from the magnet an undulatory current of electricity is induced in the coil of wire which surrounds one end, this coil being connected by a line wire with the coil and magnet of a similar instrument. The current so disturbs the condition of the latter magnet, that it attracts and lets go its disc, causing it to vibrate in exact unison with the one first moved. Bell made the human ear his study, and the diaphragm of his first speaking telephone was membrane, with an iron armature attached, but this was in time discarded for the thin iron plate at present used.

The telephone is so simple in construction that any one with a small amount of mechanical ingenuity would have little difficulty in making an experimental pair. I would however warn you that they must not be put to practical use, as the invention is patented, and though a pair may be made for a few shillings, a complete set with call bells for short circuits costs £50. First, then, procure six pieces of mahogany 4 in. × 4 in. and $\frac{3}{8}$ inch thick. Screw four of these together, two and two, by means of a brass nail at each corner, then bore a 2-inch hole through the centre of each pair; take a couple of ferrotype plates and roughly cut them into 3-inch discs, which are to be placed between the pieces of mahogany just mentioned by undoing the screws and again tightening up. We have thus a pair of 2-inch diaphragms. Procure a pair of permanent bar magnets 4 inches long and $\frac{3}{8}$ inch diameter, with holes screwed into each end, and into one end of each fix a piece of $\frac{3}{8}$ inch soft iron rod, half-an-inch in length beyond the screwed piece—an ordinary sixpenny horse shoe magnet answers admirably instead of the bar form, but the soft iron core must then be 1 inch long and one-half of its length flattened so as to lie close to the flat magnet, to which it may be bound with twine; common thin tinned iron may also replace the ferrotype plates, though these and all other necessaries may readily be procured from any philosophical instrument maker. On this soft iron, slip, $\frac{3}{8}$ inch apart, two bone rings—as used for shields for feeding bottles, having enlarged the holes with a file so that the rings may fit tightly over the iron—then wind on the reels thus made, $\frac{1}{4}$ of an ounce of No. 36 silk covered copper wire, leaving some inches of each end hanging free, and cover the whole with a few rounds of knitting wool for protection. Now fix the magnets thus armed on the odd pieces of mahogany, by means of three screw nails, two screws on one side and one on the other, having first cut out of one end of the boards a semicircle to permit the reels to fall into; now fix the boards carrying the magnets to the diaphragm by means of a couple of brass screws, so that they will form the letter T—the magnet being the leg and the diaphragm the top piece. Take care to have the magnet in the centre of the disc and adjust it so as to be as close as possible without touching when the latter vibrates. The two free ends of the wire should now be fixed to the board by terminals or a couple of screw nails and the instruments are now complete. But they are improved by fixing outside of the diaphragm a mouth piece shaped like the aperture of a speaking tube, having an opening of about $\frac{5}{8}$ inch diameter near the plate. It is only necessary to take one out of ear shot and connect the two instruments together by a double line of wire, or if only one-line wire be used, both of the free terminals must be connected with the earth by a gas or water pipe to complete the circuit. In speaking to the telephone the articulation must be slow and distinct, high pitched voices suiting best, and it need not be very loud; but in listening, the instrument must be held close to the ear, and while perfect stillness is preserved, all attention must be given to catch the small voice.

For this reason public exhibitions of the telephone are usually disappointing; at large meetings after being described it is put in operation and handed to the chairman who listens and tells the audience that he has heard the voice, and with that they have to be satisfied. For such a meeting as the present it is better suited, but it is necessary to disabuse your mind of all the exaggerated accounts from American sources which flooded the newspapers some months ago. You must be very patient and very attentive, and I have no doubt all will in turn hear. I shall first let you hear the instrument sing aloud by a simple arrangement. Taking a ferrotype diaphragm mounted as just described for the telephone, having first removed the varnish from the highly polished side by laying it a couple of minutes on blotting paper soaked in chloroform, a wooden bridge is made over one side and a pointed brass screw nail driven through it and carefully adjusted so as to nearly touch the naked iron.

A piece of wire is soldered to the iron plate and another to the nail. If this "contact-breaker" is held before the mouth when singing, it will be found that the vibrating diaphragm strikes the nail point with a rapidity varying with the pitch of the note, producing a buzzing noise, and if this instrument and a one-cell battery are put into the circuit with a telephone, whatever is sung into the contact-breaker is transmitted to the telephone, which is now heard to sing loud enough to be audible over the whole room. There is here, however, no articulation, the "music" being akin to that produced by a speaking trumpet, and is of the same type as that which created such a stir and disappointment at the Queen's Theatre in London in August last.

The articulating telephone was then attached and handed among the audience, while messages were sent to and from the laboratory, where the other terminus was located, but from the difficulty of obtaining perfect silence in the crowded room, and the close and heated atmosphere the voice was not always distinctly audible to unaccustomed ears.

Dr. Stevenson Macadam (who had the advantage of hearing the instrument in the stillness of the laboratory), said that he had had experience in working Bell's telephone at the British Association meeting, and at Plymouth, and also at another meeting at Aberdeen, and knew what difficulties lay in the way of a public exhibition of such a delicate instrument; he was pleased to be able to say that Mr. Howie's instruments compared favourably with those he had heard. He believed there was a great future in store for the telephone, and that business men wishing to communicate with each other at a distance would soon be able to do so by the telephone: one would be shut up in a padded room at each end, and they could then at once open communication in their own voices.

Mr. Mackay, in moving a vote of thanks to Mr. Howie, alluded to the great interest taken in this instrument by all classes. The other day he had seen in a neighbouring street an itinerant vendor disposing of them in large numbers, assisted by a couple of street arabs at the ends of the thread as operators.

A vote of thanks was then awarded to Mr. Howie, who in acknowledging it referred to the pleasure with which he had listened to Dr. Wilson's lecture, which recalled a session of lectures on physiology he had attended many years ago in the "Andersonian," Glasgow, and made him wish to draw the attention of the younger members to the evening lectures on that subject delivered at the Watt Institute in Edinburgh. There was one lecture weekly, and the fee was only 5*s*. for the winter course.

After the lecture a number of gentlemen who remained behind obtained very favourable results in the now comparatively quiet room.

Mr. Mackay intimated that through the kindness of Professor Archer the next meeting would be held in the Museum of Science and Art, on the evening of Tuesday, 29th January, but billets would be issued in a few days.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The fifth general meeting was held at the Royal Institution, December 6, 1877. The President, Mr. T. F. Abraham, in the chair.

The minutes of the previous meeting were read and signed.

The question-box was opened and the queries replied to by the President and members. One query asking for a reliable and correct method of testing the purity of cream of tartar elicited further information and discussion from Mr. Michael Conroy, F.C.S., Dr. Symes, and Mr. A. E. Tanner.

Dr. Symes said it would be remembered that the discussion arose at the previous meeting from the fact that cream of tartar had been found at Huddersfield and elsewhere to contain baryta in small quantities. It seemed clear that this could not have been added fraudulently as an adulterant, and yet no one could account for its accidental presence. Feeling that this was too serious a matter to remain in obscurity, he (Dr. Symes) had looked it up, with the following results:—In the *American Chemist* of 1873, Mr. J. Lawrence Smith proposed to prepare the tartrate from sulphate potassa by heating it with carbonate of baryta and then adding the requisite quantity of tartaric acid. This, however, was a laboratory process, for comparatively small quantities. In Hofmann's 'Juries' Report on the Chemical Products and Processes of the 1867 Exhibition,' he mentions a proposition by M. Kuhlman to use baryta instead of potassa for producing its tartrate for dyeing. But in this country, as early as 1856, Messrs. Pontifex and Ogston, of London, patented certain improvements in the manufacture of tartaric and citric acids, in which they treat crude tartar with carbonate of lime or sulphate of barium, and in the same year Mr. Pontifex patented a process for preparing citrates and tartrates from the mothor liquor left after crystallizing out citric and tartaric acids, and says, "if necessary letting any lime or baryta or other matter deposit." Thus it will be seen that some portion of the cream of tartar of commerce is made from the mother liquor of tartaric acid, which mother liquor may contain baryta. This, therefore, sufficiently accounts for its occasional if not frequent presence in minute quantities in that article as sold. He would mention to any one interested in the manufacture of these articles that there is a paper of considerable interest by Mr. Warrington in a recent volume of the *Chemical News*, which treats the subject most exhaustively in seventy octavo pages.

Dr. Symes also exhibited a specimen of artificial vanillin, which he presented to the museum, and detailed the method of its manufacture.

Other miscellaneous communications having been received, the meeting closed.

The sixth general meeting merged itself with the associated soirée of the literary, scientific, and art societies of Liverpool, which was held at St. George's Hall, December 14, 1877, under the presidency of his worship the Mayor of Liverpool, Mr. A. B. Forwood. The exhibits on the part of the Chemists' Association were numerous and highly attractive, consisting of drawings and models of the latest improvements in chemical plant; specimens of improved forms of chemical apparatus; specimens illustrative of the principal chemical manufactures and of fine and rare chemicals, acids, alkaloids, etc. Amongst the contributors of the objects were Messrs. Bowdler and Bickerdike, of Church, Dr. J. Campbell Brown, Liverpool, Messrs. Calvert and Co., Manchester, Mr. Alfred E. Fletcher, F.C.S., Mr. George Gordon, Liverpool, Messrs. Hargreaves and Robinson, Widnes, Messrs. John Hutchinson and Co., Widnes, Messrs. Hopkin and Williams, London, Messrs. Mottershead and Co., Manchester, and Mr. Peter Spence, F.C.S., etc., Manchester.

At half-past eight o'clock, in the Crown Court, Mr. Edward Davies, F.C.S., gave a short lecture on the subject of "Spontaneous Combustion." He described Homburg's pyrophorus made from alum and starch, and then alluded to the discovery of phosphorus and the intense interest which it excited at the time. The influence of a fine state of division in favouring spontaneous combustion was illustrated by a solution of phosphorus in bisulphide of carbon poured on filtering paper, also by reduced iron and lead reduced from the tartrate. The latter combustions being made in oxygen as well as in air. Spontaneously inflammable gases were next illustrated by phosphuretted hydrogen in air and in oxygen and siliciuretted hydrogen. Zinc ethyl poured into oxygen made a most brilliant illumination, and concluded the part illustrating spontaneous combustion arising from oxidation.

The lecturer spoke on the subject of spontaneous combustion in human beings, and expressed his disbelief in such occurrences. The human body contains nearly four-fifths of its weight of water, and the dry residue is not very inflammable, so that it is very difficult to imagine its taking fire by itself.

The lecture concluded with some examples of spontaneous combustion arising from chemical actions other than oxidation. Among these were antimony in chlorine and turpentine in the same gas.

The experiments were on a large scale and performed most successfully.

LEEDS CHEMISTS' ASSOCIATION.

Since the last report of the proceedings of this Association three general meetings have been held. On each occasion the chair was occupied by Mr. P. Jefferson, the President, and a vote of thanks cordially awarded to the lecturer.

"Colour and its Lessons" was the subject of the paper read by Mr. H. Pocklington, F.R.M.S., on Nov. 14, 1877. Treating the subject from the physical and physiological basis, he briefly touched upon the nature of light, explaining the undulatory theory and showing how completely it explained the varied colour phenomena met with in nature or brought about by scientific experiment. He then discussed, somewhat fully, the question as to how far the sense of colour-seeing was explained on the three nerve theory, expressing his own belief in the, at all events, approximate truth of the theory, which he thought was beautifully supported by the different results obtained by purely ocular analysis of coloured or white light and those obtained by prismatic analysis of the same light. He showed, for instance, that all the green lights of nature were impure and contained a large admixture of red and blue, and also that it was possible to obtain white light, which was sensibly pure white light to even the cultured eye, but which the spectroscope proved to be by no means the white light of the sun, which itself does not contain light of all the wave lengths comprised between the red and violet ends of the spectrum.

Mr. Thomas Fairley, F.C.S., contributed the paper for December 12, 1877, entitled "Spontaneous Combustion, and the Causes of Fires," with experiments. He showed that the term spontaneous combustion may be used either in a general or special sense. In the one it refers to all fires not due to the actual contact of hot bodies or the direct action of heat. In the other it is restricted to the combustion produced by the chemical action of bodies, originally cold, upon each other. He explained, and showed experimentally, numerous cases of spontaneous combustion due to the latter cause, more especially where the combustible bodies are finely divided, so as to expose a large surface to the action of the air or other gases acting upon them. Finely divided metals, such as lead, iron, zinc, take fire when exposed to the air. Recently fires had occured on board ship, due to the action of seawater on cargoes of zinc dust. The lecturer also instanced the class of nitro-compounds of which nitro-glycerine and gun cotton are best known; these, if impure, become still more liable to spontaneous combustion and explosion, as shown by the numerous accidents which have occurred. He referred to the Australian emigrant ship believed to have been lost by the explosion of badly prepared gun cotton, forming part of its cargo. Of fires due to other causes, he mentioned the numerous instances of buildings, trees, etc., set on fire by the electric discharge, and in particular the recent fire at Inverary Castle; also the fires caused by the heating of the bearings of machinery by friction or any kind of resistance to motion. Mr. Fairley next described the conditions under which ordinary materials—such as wet hay, sawdust, oily waste, etc.—tend to heat and fire spontaneously, illustrating these by experiments with readily inflammable substances. He described the mode of conducting experiments to ascertain the heating tendency of oils used in manufactures. In experiments undertaken for this purpose he found that cotton seed oil and similar drying oils applied to cotton wool and kept in a warm atmosphere took fire spontaneously in eight hours, or even a shorter time. Other causes of fire different from the preceding are those produced by dangerous substances, either on account of their low ignition point or because they cannot be extinguished by water, or because they give off an inflammable vapour at temperatures near the ordinary range of our climate. Sulphide of carbon is a material which is now extensively used for extracting fat from seeds, wool waste, etc., and for other purposes. It is also present, sometimes in considerable quantities, in ordinary coal gas. It is very inflammable, taking fire at a temperature not far above that of boiling water—300° Fahr. While ordinary combustibles can be readily extinguished by the application of water, petroleum and similar light oils which float on water cannot be extinguished by this means; in such cases sand, ashes, dry earth, etc., are the proper materials to throw on the fire. The Act of Parliament relating to petroleum requires that such liquids shall not be sold without a special label where they give off an inflammable vapour at temperatures below 100° Fah.; and the lecturer showed how the "flashing test" can be applied to distinguish such liquids. In concluding, he drew attention to the application of tungstate of soda to render muslin and other fabrics non-inflammable.

On January the 9th, "The Geographical Distribution of Plants" was the subject of a paper by Professor L. C. Miall, F.G.S., who referred to the different species of plants found in the tropics, temperate and arctic regions, pointing out that they were quite distinct in the majority of cases, although some, such as the leguminosæ, were indigenous to the temperate and torrid zones, yet in this country they rarely exceeded the size and character of a shrub, whilst in the tropical regions they assumed the proportions of large trees. Some plants in this country appeared to have their likes and dislikes, being found only on the tract of limestone, whilst others again preferred the sandstone grit, and were never found upon limestone soil. Another species is always found upon or near the sea coast, and rarely inland, except where there are salt marshes. Several European plants were quite cosmopolitan, being found in almost all parts of the world. How they were so widely dispersed was not easily understood. Some seeds were no doubt carried by the winds, others by migratory birds or merchandise; this was the case with seeds from many foreign parts, which came to this country in the ballast of ships, in bales of cotton, and various other ways. It was remarkable, however, how few of those imported into England were acclimatized, whilst those from this country, distributed no doubt by similar means, flourished with astonishing rapidity in America, Australia, and other countries. The mere compilation of the names and number of plants found in certain districts was not so useful as precise information of the soil, position, and circumstances in which they were met with.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, January 17th, Professor Odling, Vice-President, in the chair. After the confirmation of the minutes of the previous meeting, the reading of presents to the library, etc., the following certificates were read for the first time:—W. Hudson, G. S. Johnson, T. Lichtenstein, W. B. Lowe and L. T. Wright.

The chairman then announced that a ballot for the election of fellows would take place at the next meeting of the Society (February 7th).

The first paper was entitled—

On the Luminosity of Benzol when burnt with non-luminous Combustible Gases. By E. Frankland and L. T. Thorne.—It was pointed out by Dr. Frankland in

1852,* that hydrogen, carbonic oxide, and marsh gas practically contribute nothing to the luminosity of coal gas, and that the only constituents of value were benzol, ethylene, propylene, butylene and acetylene. The authors have endeavoured to determine the luminosity of benzol individually, and propose in further papers to make similar experiments on the other illuminating constituents of coal gas. Many attempts were made to burn benzol with a smokeless flame, and several lamps were constructed by Mr. Silber, but all the experiments yielded unsatisfactory results, and the authors had to limit their experiments to the determination of the luminosity of benzol vapour after dilution with hydrogen, carbonic oxide, and marsh gas. These three gases were severally prepared in the usual way, and were passed through a brass cylinder six and a-half inches long, three inches internal diameter, packed with sponge saturated with pure benzol, the whole being kept at a constant temperature by immersion in water. The quantity of benzol in the gas was determined by absorption with sulphuric acid. The authors obtained the following numbers:—

1 cubic foot of benzol vapour burnt with hydrogen in a fish-tail burner gave for one hour the light of 69·71 candles at the standard temperature and pressure.

1 cubic foot of benzol vapour burnt with carbonic oxide gave for one hour the light of 73·38 candles at the standard temperature and pressure.

1 cubic foot of benzol vapour burnt with marsh gas, first series, gave for one honr the light of 92·45 candles at the standard temperature and pressure.

1 cubic foot of benzol vapour burnt with marsh gas, second series, gave for one hour the light of 93·94 candles at the standard temperature and pressure.

Hence 1 lb. avoirdupois of benzol gives when burnt with hydrogen the light yielded by 5·793 lbs. of spermaceti.

1 lb. avoirdupois of benzol gives when burnt with carbonic oxide the light yielded by 6·100 lbs. of spermaceti.

1 lb. avoirdupois of benzol gives when burnt with marsh gas, first series, the light yielded by 7·682 lbs. of spermaceti.

1 lb. avoirdupois of benzol gives when burnt with marsh gas, second series, the light yielded by 7·803 lbs. of spermaceti.

Or, in other words, a given weight of benzol produces 5·3 per cent. more light when it is diluted with carbonic oxide, and between 32·6–34·7 per cent. more light when diluted with marsh gas, than when diffused in hydrogen. The authors point out that this difference is probably due, at all events in part, to the different pyrometric thermal effects of the gaseous mixtures.

In reply to the Chairman, Dr. Frankland stated that this increase in the illuminating power of benzol when mixed with marsh gas was not opposed to his former statement that marsh gas did not contribute materially to the illuminating power of coal gas, because in coal gas the principal hydrocarbons were ethylene, and members of that series, which would not raise the temperature to any considerable extent when burnt with marsh gas as compared with the effect produced by benzol vapour and marsh gas.

After the thanks of the Society had been given to the authors, Dr. Gilbert, Vice-President, took the chair.

The next paper was read by Mr. Perkin—

On the Action of Reducing Agents on Potassium Permanganate. By F. Jones.—Hydrogen in neutral solutions decomposes permanganate according to the following equation:—$2KMnO_4 + 8H = Mn_2O_3 + 2KHO + 3H_2O$, the reaction is hastened by raising the temperature. In solutions rendered acid by sulphuric acid, hydrogen produces a similar decomposition. In alkaline solutions a similar action takes place, but much more slowly, a manganate being first formed. Ammonia produces the decomposition—

$$8KMnO_4 + 8NH_3 = 4Mn_2O_3 + KNO_3 + KNO_2 + 6KHO + 9H_2O + 6N.$$

Phosphine when passed through a series of flasks containing solution of potassium permanganate forms sesquioxide of manganese. Phosphorus and phosphoric acids

$$6KMnO_4 + {}_4PH_3 = 3Mn_2O_3 + {}_2K_2HPO_3 + {}_2KH_2PO_3 + 3H_2O.$$

and $2KMnO_4 + PH_3 = Mn_2O_3 + K_2HPO_4 + H_2O$.

Arsine produces a similar reaction—

$$2KMnO_4 + As_3H_3 = Mn_2O_3 + K_2HAsSO_4 + H_2O.$$

The reaction with stibine is—

$$2KMnO_4 + SbH_3 = Mn_2O_3 + K_2HSbO_4 + H_2O.$$

The first action of oxalic acid on potassium permanganate results in the formation of manganese and potassium oxalates, water, and carbonic acid. A further addition of permanganate precipitates manganese sesquioxide, carbonic acid and oxygen being evolved and potassium carbonate formed. In the presence of sulphuric acid oxygen is given off. Oxygen is also evolved with carbonic acid when sulphuric acid acts on manganese dioxide in presence of an oxalate. When strong solutions of permanganate and manganese chloride are mixed sesquioxide of manganese separates out, whilst bubbles consisting of chlorine and and oxygen are evolved. By mixing dilute solutions oxygen, but no chlorine, is evolved. Solutions of ferrous and manganese sulphates similarly evolve oxygen when mixed with solutions of potassium permanganate.

Mr. D. Howard remarked that in the exhibition at Paris, 1867, a compound was exhibited which was said to be permanganate of ammonium; it exploded eventually with some violence. It was curious that such a compound could have been formed and sent to the exhibition, when according to the reaction in the above paper ammonia decomposes permanganate soon after the substances are mixed.

The next paper was read by Mr. Spencer Pickering—

On the Action of Sulphuric Acid on Copper.—According to the author, there are only two primary reactions, the first is represented by the equation $Cu + 2H_2SO_4 = CuSO_4 + SO_2 + 2H_2O$. The second $5Cu + 4H_2SO_4 = Cu_2S + 3CuSO_4 + 4H_2O$. Other products which may be formed are due to the subsequent decomposition of the subsulphide by sulphuric acid. Pure electrotype foil 0·15 mm thick was used. 3 grm. being acted on by 16·3 c.c. strong sulphuric acid, sp. gr. 1·843, for 30 minutes. The action commences at 19°, rapidly increasing as the temperature rises. But little gas is evolved until 130° is reached. No gas such as oxygen or hydrogen insoluble in water is given off, nor any sulphuretted hydrogen liberated during the reaction. The subsulphide formed seems to be deposited on the metal itself in a compact layer, it is not oxidized by exposure to air or by drying in a steam-bath at 100°C. Care was taken that some copper was always left undissolved at the end of the experiment. The author gives in a table the results of many experiments made at different temperatures. At 19°C. ·00015 per cent. Cu. dissolved in 30 seconds, at 100°C. ·052 per cent., at 150° 1·15 per cent., at 220° 70·57 per cent., at 270 nearly 100 per cent. in a few seconds. In two experiments the proportion of copper converted into sulphide to that converted into sulphate was found to be 2 : 2·914 and 2 : 2·964. At high temperatures but little sulphide is formed. The action of sulphuric acid on protosulphide is represented by the equation $2CuS + 4H_2SO_4 = S_2 + 2CuSO_4 + 4H_2O + 2SO_2$. The decomposition of the subsulphide by the equation $Cu_2S + 2H_2SO_4 = CuS + CuSO_4 + 2H_2O + SO_2$. The author thinks that the formation of the copper sulphide is due to the direct union of the copper with the sulphur in the acid, which opinion is supported by quantitative experiments and various theoretical considerations. The quantities of sulphuric acid actually used in the experiments, and the amount of sulphurous acid evolved were determined

* 'Memoirs, Manchester, Lit. and Phil. Soc.,' 2nd series, x, 71.

and found to agree with those required by the above equations. In some experiments a small sublimate of sulphur was observed round the neck of the flask in which the copper had been dissolved; this is probably due to the tendency of free sulphur to creep up the sides of the containing vessel. The effect of an electric current was tried: when the copper was rendered electro-positive it dissolved more rapidly and more sulphide was formed. When it was electro-negative more sulphate was produced and less sulphide. In some experiments the coating of sulphide protected the copper from the action of the acid to a notable extent. If the copper used be impure it dissolves more rapidly, and two sulphides are formed owing to the rapid formation of subsulphide, and its subsequent decomposition by the acid. The author suggests that the increased action of the acid on impure copper may be due to some sort of catalytic action of the impurities, analogous perhaps to the solution of alloys of platinum and silver in nitric acid. The action of dilute acids was also investigated. In conclusion, the author gave a *résumé* of the explanations which have been offered from time to time of the action of sulphuric acid on copper by previous experimenters, and criticized their results.

The next communication was—

On the Analysis of Sugar. By G. Jones.—The author proposes to estimate sucrose volumetrically by adding a 0·1 per cent. solution to a decinormal solution of permanganate, acidulated with sulphuric acid, until the dirty brown hydrated peroxide of manganese, which is at first formed, is reduced and dissolved. The solution, contained in a porcelain dish, is boiled after each addition of the saccharine liquid. No analyses are given, but the author states that in every case he obtained results which fully justify him in drawing attention to the process. The colouring matters in sugar do not seem to affect the value of the estimations.

Mr. Warington drew attention to the fact that this use of permanganate must be limited to cases in which the sugar was tolerably pure, and that it would be useless for determinations of the sugar present (*e.g.*) in the juice of the beet root, etc.

The last paper was—

On the Decomposition Products of Quinine. By W. Ramsay and J. Dobbie.—Five grms. of quinine were gently treated with 50 grms. of permanganate in solution. After complete reduction the alkaline liquid was filtered, neutralized with nitric acid, and precipitated with nitrate of lead. The precipitate was decomposed by sulphuretted hydrogen, and the new acid converted into a silver salt and the latter decomposed by sulphuretted hydrogen. The filtrate was evaporated *in vacuo*, and furnished needle-like crystals of a new acid, which proved to be dicarbopyridenic acid, identical with that obtained by Dewar from picoline. It gave 9·6 per cent. water, 3·16 per cent. H., and 44·56 per cent. C. Dicarbopyridenic acid contains 9·83 per cent. water, 3·00 per cent. H., and 50·30 per cent. C. The new acid contains nitrogen, melts 251—252°, gives a red colour with ferrous sulphate and a characteristic odour on heating. The silver salt gave 56·21 per cent. Ag, and behaves like mercury sulphocyanide; by titration the potassium salt contains 32·5 per cent. K, the soda salt 21·76 per cent. Na. The salts of dicarbopyridenic acid contain respectively 56·69 per cent. Ag, 32·15 per cent. K, and 21·80 per cent. Na. Besides the acid some quantity of a red deposit was obtained, the yield of this substance was diminished by effecting the reaction at 100°, whilst the yield of acid was increased. By oxidizing Marchand's quinetin with permanganate the authors obtained an acid identical with the one above described.

The Society then adjourned to February 7, when the following papers will be read:—

1. "Notes on the Tannins," by Dr. Paul and Mr. Kingzett. 2. "On a Method for the Determination of Boiling Points," by H. C. Jones. 3. "On the Alkaloids of the Aconite family; part ii., the Alkaloids of *Aconitum ferox*," by Dr. Wright and Mr. Luff. 4. "An Inquiry into the Action of the Copper-Zinc Couple on Alkaline Oxysalts," by Dr. Gladstone and Mr. Tribe. 5. "On the Estimation of Phosphorus in Iron and Steel," by C. Riley.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held at 17, Bloomsbury Square, on Thursday, Jan. 17, when a paper was read by Mr. Allen, on "Chemical Science some Two Hundred Years Ago." The author commenced by briefly tracing the history of chemical science up to the end of the seventeenth century, dwelling especially on the elementary principles held by different philosophers. The rise, progress, and decline of the alchemists were noticed, together with the chief objects of their study. Having alluded to some conjectures pointing to the present advance in chemistry, he proceeded, in the supposed words of one of the philosophers of two centuries ago, to compare some of the theories of that period with those of the present time. Having noticed what an easy task the pharmaceutical student had with only three anonymous elements to study he gave an instance of, what he was pleased to term, the "Atrocious, elongated, barbarous titles" of chemical compounds; the supposed merit of which seemed to him to consist in their containing the names of all their component elements.

A vote of thanks was unanimously awarded Mr. Allen for his paper, and the meeting then adjourned.

Parliamentary and Law Proceedings.

What is a Mineral Water.—The Sale of Pyretic Saline.

In the Court of Appeal of the Supreme Court of Judicature, before Lords Justices Bramwell, Brett, and Cotton, the case of Her Majesty's Attorney General *v.* Lamplough came on for hearing on Tuesday and Wednesday last. This was an appeal by the defendant from an order made on the Revenue side of the Exchequer Division, discharging a rule nisi to enter the verdict for the defendant. The case came before that Court under the following circumstances:—The Attorney-General had, on behalf of the Crown, laid an information charging the defendant, Mr. Henry Lamplough, that he did, in September, 1876, "expose and utter and vend a bottle of medicine containing a certain preparation to be used and applied as a medicine or medicament for the prevention, cure, and relief of disorders and complaints incidental to and affecting the human body, called Lamplough's Effervescing Pyretic Saline, wherein he had, or claimed to have, an occult secret or art for making and preparing the same," and that he did so sell it "without the cover, wrapper, or label provided by the Commissioners of Stamps for denoting the duty chargeable on such bottle." The information came on for trial before Mr. Baron Cleasby and a special jury, at Westminster, when certain evidence having been given, a verdict for a £10 penalty was taken by the Crown, subject to the opinion of the Court above on the point of law involved. The question accordingly came on for argument before the Lord Chief Baron and Barons Cleasby and Huddleston, on a motion to enter the verdict for the defendant, when the Court was divided in opinion, the Lord Chief Baron being of opinion that the preparation in question was not a medicine within the meaning of the statute under which it was sought to be taxed, while Barons Cleasby and Huddleston took a contrary view, and gave judgment for the Crown. From this decision the defendant now appealed to this Court. Mr. Herschell

Q.C., Mr. Ince, Q.C. (of the Chancery bar), and Mr. E. B. Cooper, were counsel for the appellant; and the Attorney-General, the Solicitor-General, and Mr. Dicey represented the Crown. The question involved depended on the construction which should be placed on certain acts of parliament. By the 44th Geo. III. stamp duties were chargeable on certain patent medicines which were specified in the schedule by name, and also by general words. That act was repealed by the 52nd Geo. III., c. 150, so far as regarded the schedule, and another schedule was enacted which set forth the articles to be taxed in alphabetical order, and under the heading "waters" appeared all artificial waters impregnated with soda, or mineral alkali, or carbonic acid gas, and all compositions in a liquid and solid state. "Lamplough's Pyretic Saline" is composed of tartaric acid, bicarbonate of soda, and a small quantity of chlorate of potash, and it was admitted that it formed an artificial mineral water when the ingredients sold in a solid state were mixed with water, and would as such be liable to be taxed but for the amending act—the 3rd and 4th William IV., c. 97, sec. 20—which altered the schedule of the 52nd Geo. III., and repealed the duties as regards artificial mineral waters. The question was whether the preparation in question was of this character, or whether it came within "the tail-end of the schedule" of the act as a medicament which a person had the right of selling under letters patent, or which he put forward by advertisement for the relief or cure of disease. For the defendant it was contended that Pyretic Saline was a beverage which was, in point of fact, an artificial mineral water, and therefore exempt from duty, and that if so charged Schweppe's soda water and lemonade, and all others of the same kind, would be chargeable; while for the Crown it was submitted that it did not come within the provisions of the repealing act as an artificial water, but the contrary, as its sale depended on its medicinal properties.

On the conclusion of the arguments their lordships delivered a unanimous judgment, holding that it was the intention of the legislature by the repealing act of William IV. "to exempt all these waters from taxation, even if the vendors held that they were beneficial for human ailments, and therefore that the Pyretic Saline was not chargeable with duty."

The judgment of the Court below was accordingly reversed, and the appeal allowed with costs.

Poisoning by Laudanum.

On Thursday, Jan. 17, an inquest was held before Mr. Rider, at the Leeds Town Hall, touching the death of Joseph Parsons, 46, draper, Leeds Street, Burmantofts. Deceased, who has recently been addicted to intemperate habits, after selling his home up went on the previous Tuesday evening to an eating-house, and asked for a bed. He was affected with liquor at the time. He went to bed, and on the landlady going to call him up at eleven o'clock he appeared ill and was groaning loudly. Mr. Hunt, surgeon, was sent for, and, after using the stomach-pump, ordered the man to be taken to the infirmary. On the dressing-table in the bedroom occupied by Parsons were three small empty bottles, labelled "Laudanum." The bottles bore the names of different chemists.

Mr. E. Jacob, physician at the infirmary, stated that when the deceased was admitted into that institution he appeared to be suffering from narcotic poisoning, and was unconscious. He died shortly after two o'clock on the following morning. He must have drunk over three-quarters of an ounce of laudanum.

It was stated that the deceased had previously made two attempts to commit suicide by drinking poison whilst suffering from depression of spirits consequent on heavy drinking.

The jury returned a verdict of "Suicide whilst in a state of temporary insanity produced by excessive drinking."—*Yorkshire Post.*

Dispensing Memoranda.

[50]. Ext. Ergotæ Liq.—Will you kindly permit me a last remark concerning Dispensing Memorandum No. 50, Extractum Ergotæ Liquidum.

My answers in Nos. 392 and 394 referred to the crystals found by "Young Pharmacist" sparingly or not at all soluble in water, not to those described by Mr. Gerrard in last number as being soluble in water.

The further statements of Mr. Gerrard induced me to make the following quantitative examination of the ash of extractum ergotæ liquidum.

10 grams of the liquid extract were evaporated, burnt to coal, the latter exhausted with diluted hydrochloric acid, again evaporated, heated in a platinum crucible to a dark red heat, and weighed:—

$$0{\cdot}15 = 1{\cdot}5 \text{ per cent.}$$

Re-dissolved in a little distilled water a salt remained,* which well dried weighed 0·0188, and subtracted from ash found left 0·1312 = 1·312 per cent. To the clear solution was added bichloride of platinum in excess, evaporated in a water-bath to dryness, then treated with spirit. rectif., which left the pot. platin. chlorid. undissolved. The latter collected in a well dried and weighed filter = 0·203:—

$$\begin{array}{lcll}
KCl, Pt\,Cl_2 & : & KO & \\
244{\cdot}4 & : & 47{\cdot}2 & = 0{\cdot}203 : x \\
x & = & 0{\cdot}0392 \text{ KO.} & \\
KCl, Pt\,Cl_2 & : & KCl. & \\
\text{or } 244{\cdot}4 & : & 47{\cdot}7 & = 0{\cdot}203 : x \\
x & = & 0{\cdot}062 \text{ KCl.} &
\end{array}$$

The same subtracted from soluble ash found = 0·1312; there remains 0·0692 = chloride of sodium.

The difference of climate and soil may account for the difference of inorganic matter found in the ergot.

The great demand of ergot for exportation, especially last year in Germany, may have induced people to collect the *Claviceps purpurea*, not only from *Secale cereale*, but also from *Alleopecurus pratensis*. Even *Claviceps microcephala* from *Phragmites communis*, *Claviceps pusilla* from *Andropogon Ischaemum*, and *Claviceps nigricans* from *Scirpus acustris*, may be sometimes found mixed mixed it.

H. W. Langbeck.

[52] The prescription quoted in No. 52 is open to another construction, viz., that the figure two by some misadventure was omitted after the words "fiat pil." and that it should stand thus—

℞ Ext. Hyoscyami . . . . . gr. iii.
Pil. Rhei Co. . . . . gr. iv.
Fiat Pil. ij. Cap. i h. s. Mitte xii.

This would make four different ways that the same receipt might be dispensed at four different establishments, and the same might occur with any other imperfect or doubtful prescription. Consequently I would supplement the memorandum of "S. H. P." by suggesting that (reference to the prescriber being impracticable) the first dispenser of such a prescription should make a rule of marking on the prescription the same memoranda that he makes in his own prescription book, showing how he has treated it, for the guidance of the next person that may be called upon to dispense it, thereby probably preventing annoyance to both a brother chemist and his customer.

J. C.

* The salt consisted of metaphosphate of lime ($CaOPO_5$ produced by heating the ash, which contained then acid phosphate of lime $(CaO \cdot 2\,HO) \cdot PO_5$. Besides I found traces of copper, the result of using a copper vessel in the preparation of the extract.

Professor Attfield found in extractum ergotæ (not the liquid) 3 per cent. of sulphate of potash. *Vide* Dorvault's 'L'Officine.'

[54].

℞	Kreosoti	♏ xxiv.
	Pil. Rhei Co. (sine Theriaca).	gr. xvj.
	Pulv. Saponis	gr. viij.
	Magnes. Calc.	gr. xij.

M. ft. pil. xij.

Mix the creasote with the soap, add the pil. rhei, and lastly the mag. calc. (previously made hot in a crucible); after standing for a short time in the mortar, the mass may be rolled into five grain pills.

JOHN COLEGROVE.

[57]. In answer to No. 57, I certainly think the intention of the prescriber would have been carried out if a ℥ij mixture only had been made. I have dispensed numerous prescriptions of a similar nature where the word "adde" has been omitted, and I know in several instances that the intentions of the prescribers were carried out by my so doing. If only a ℥ij mixture had been made ʒj would not be too much for a dose.

C. F. JAMES.

[57]. From the quantities ordered in this prescription, I should give it as my opinion that a ℥ij mixture was intended, and should accordingly have dispensed it as such. In cases of doubt, and where the prescriber cannot be communicated with, I think it is usual for the dispenser to use his own judgment. Why then did "Beta' act in opposition to his judgment?

A. E. C.

[58].

℞	Potass. Iodid.	ʒj.
	Potass. Bicarbon.	ʒij.
	Ferri Ammon. Citrat.	ʒij.
	Aq. Flor. Aurant.	℥viij.

M.

The above cannot be made so that it will not effervesce, or rather decompose. Any physician thoroughly up in chemistry would know better than to prescribe potass. bicarb. and ferri ammon. cit. together. In Squire's 'Companion to the British Pharmacopœia,' I find, under the head of "Ferri Ammonia Citras," "care must be taken not to put the salt of iron into the solution of bicarbonate of potash, because if it is, carbonic acid will be given off, and the bottle burst."

I am aware it is frequently done, but, as I have shown, injudiciously.

Edinburgh. NIL DESPERANDUM.

[58]. Had "Beta" referred to the "Characters and Tests" of ferri ammon. cit., given in the B. P., he would have discovered the cause of the effervescence in this mixture, and he would have been able to perceive that obtaining chemicals of unquestionable quality "from one of the best London houses" was the surest method of ensuring, instead of avoiding the effervescence.

This effervescence, however, is exceedingly slight, and all difficulty is easily obviated by leaving the bottle uncorked for a moment or two.

Scarborough. A. E. C.

Notes and Queries.

[576]. STINKING HELLEBORE.—I shall be obliged if any reader will tell me where I can obtain a little powdered Stinking Hellebore root (*H. fœtidus*). I want it for a customer who has been reading in the *Field* newspaper lately that it is an excellent vermifuge for dogs. My London patent medicine house has kindly sent round to all the principal wholesale drug houses and herbalists, but without success. One house sends me *H. niger* for it, another *H. viridis*, and the rest say they neither keep it nor know where it is kept.

PHARMACIST.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

EXTINCTION OF GERM LIFE.

Sir,—Mr. Greenish has hastened to correct me in what he assumes to be my position with regard to the above question; but he will, no doubt, remember the warning of Friar Lawrence, "They stumble who run fast."

If Mr. Greenish will do me the favour to read the articles he refers to with closer scrutiny, I think he will find that he has fallen into the very prevalent error (an error specially dwelt upon by Professor Tyndall) of confounding bacteria with bacteria germs. The distinction is imperative, and only, it would appear, to be fully appreciated by the practical worker. The new point in my inquiry consisted in the circumstance that highly putrescible and refractory liquids were sterilized of their germs, or fermentative particles, not that "bacteria were killed," as Mr. Greenish has put it—for this had already been pointed out by Dr. Bastian and others—by continuous exposure to a comparatively low temperature. In other words, it was not the destruction of bacteria, but the prevention of their development in nutritive fluids at a low degree of heat sustained over a given period that constituted the novelty set forth in this investigation. To "kill bacteria" is one thing, to sterilize infusions of their ferments, another. Clearly, therefore, Mr. Greenish has missed the mark, and consequently his well-intentioned, but by no means happily conceived, "correction" (for which, so far it goes, he needed no aid from foreign sources) does not apply. Presuming it did; presuming, for the sake of argument, that the inference he draws from the articles in question were shown to be correct; I would undertake absolutely, upon that interpretation, to prove the truth of spontaneous generation. But, obviously, such a controversy could not be carried on in the correspondence columns of the *Pharmaceutical Journal*.

May I, in addition, remind Mr. Greenish that at the dates he gives, viz., 1872 and 1874, bacteria germs, particulate ferments, desiccated organisms (call them what you will), as presented by the light of more recent research, were, in reality, outside the ken of philosophical investigators?

W. WILLMOTT.

King's College Hospital, January 22, 1878.

"*Syrupus*."—(1) *Dicranum heteromallum*; (2) *Tortula lævipila*; (3) *Hypnum serpens*.

J. Taylor.—We are much obliged to you for your communication.

D. Stewart.—A substance is advertised under the name mentioned, and it is probably a soft paraffin.

J. B.—We believe not.

C. E. L. will find some remarks on the prescription referred to on p. 587.

M. B.—The subject will be dealt with in an early number.

B. Green.—Most commonly Syr. Rhæados is supplied under the name.

H. Goodall.—If the articles are preparations of poisons included in the schedule to the Pharmacy Act, 1868, they must be sold in accordance with the regulations prescribed by that Act.

"*Advertiser*."—Your advertisement should have been sent to Messrs. Churchill, 17, New Burlington Street. Loss of time and consequent annoyance is liable to be experienced by advertisers who persist in ignoring the instructions to this effect repeated at least twice in every issue of this Journal.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Birkett, Mr. Carpenter, Mr. Palmer, Mr. Roberts, Professor Landerer, Mr. Knowles, Mr. Chapman, Mr. Swallow, Mr. Stuart, C. F. H., "London," "Dan Amæthwr," "Inquirer," "Student."

ELEMIC ACID—CONTRIBUTION TO THE CHEMISTRY OF ELEMI.

BY DR. EUGEN BURI.

It has been shown by Professor Flückiger* that in elemi there occurs a crystallized substance, bryoïdin $= (C_{10}H_{16})_2 + 3\,OH_2$. Some time ago I also devoted a paper† to another crystallizable principle, amyrin $(C_5H_8)_5OH_2$; and I have since succeeded in isolating a third crystallizable constituent of the same drug. Both bryoïdin and amyrin are devoid of an acid character, but the new substance is undoubtedly an acid, which may be termed *elemic acid.*

It was contained in the alcoholic mother liquor, from which crystallized amyrin was obtained. On evaporating this liquor an amorphous brown resin (R) remains, which with the same weight of petroleum spirit (60° C. boiling point) yields a clear solution; this, however, becomes turbid on addition of a large quantity of petroleum spirit. The mixture is then shaken with nearly the same volume of caustic lye (about 10 per cent. of KOH), when it separates in two liquid layers and a jelly. The latter can easily be collected and, on addition of water, forms an emulsion becoming quite clear by means of ether. The ethereal portion contains a little resin, the lower layer being chiefly a solution of elemate of potassium, from which *elemic acid* is precipitated by hydrochloric acid; it is still accompanied by an *amorphous resin* of an *acid character.*

The same crude elemic acid may also be obtained by the following process:—The above-mentioned resin (R) is dissolved in twice its weight of ether and the solution shaken with caustic lye; the potassium salts of elemic acid and the resinoid acid are formed but retained by the ether; on mixing it with much water an aqueous solution of these salts is formed, the indifferent resin remaining in the ether. It is advisable to use caustic lye containing about 10 per cent. KOH; a very weak lye, say of only 1 per cent., is not so well for producing an ethereal solution of the said salts. Elemic acid is then again precipitated, as above stated, by means of hydrochloric acid.

In order to purify the acid it is repeatedly recrystallized from hot alcohol, about 0·820 sp. gr., and the crystals must be washed with cold alcohol. It is by no means easy to get them absolutely clear and colourless; if so, they are very brilliant and much larger than those of both amyrin and bryoïdin. Although the finest crystals of elemic acid attain a length of several millimetres it has been found impossible to ascertain their crystallographic character, each of them being formed of very intimately aggregated individual crystals.‡

Elemic acid melts at 215° C., yielding on cooling an amorphous mass, which may again be obtained crystallized if dissolved in alcohol. Heated for some time, even without undergoing fusion, the acid turns brownish. It is readily soluble in ether, methylic, ethylic, or amylic alcohol; sparingly so in bisulphide of carbon; not at all in water. It requires, at 15° C., for solution, 17·55 parts of alcohol, 0·826 sp. gr., 0·6556 gram of acid having been afforded by evaporating 12·1619 grams of solution saturated at the said temperature. It is much more abundantly soluble in hot alcohol; oversaturated solutions are easily formed.

The alcoholic solution of elemic acid, especially when diluted with a little water, decidedly reddens litmus; alcoholic solutions of the salts of metals are not precipitated, all the elemates being readily soluble in alcohol. The solution of the acid is lævogyre; dissolved in ten parts of absolute alcohol it deviated the ray of polarized light 3·5° to the left (temperature 20°, length of the column of the liquid under examination=200 millimetres). The polaristrobometer of Wild and sodium light were used for this experiment.

In order to submit the acid to ultimate analysis its ethereal solution was shaken with dilute hydrochloric acid and washed with water. On evaporating the solution the elemic acid was obtained entirely free from inorganic matter; if not submitted to this treatment it always contains a small amount of calcium or potassium. The following figures have been obtained with the purified acid, viz.:—

			CO_2		OH_2
1. 0·2418 of	acid	yielded	0·6922	and	0·2279
2. 0·3041	„	„	0·8649	„	0·2847
3. 0·2993	„	„	0·8541	„	0·2803
4. 0·2959	„	„	0·8444	„	0·2768
5. 0·2919	„	„	0·8319	„	0·2726
6. 0·3141	„	„	0·8957	„	0·2943

or in percentages:

	I.	II.	III.	IV.	V.	VI.
C	78·07	77·57	77·83	77·83	77·73	77·77
H	10·47	10·40	10·40	10·39	10·38	10·41
O	11·46	12·03	11·77	11·78	11·89	11·82

This would answer to the formula $C_{35}H_{56}O_4$.

C_{35}	420	77·78
H_{56}	56	10·37
O_4	64	11·85
		100·00

By writing that formula as follows $(C_5H_8)_7O_4$, elemic acid is shown to be allied both with bryoïdin and amyrin, as well as with other derivatives of terpene C_5H_8.

Elemates.—If elemic acid and carbonate of sodium are gently warmed with dilute alcohol, sodic elemate is formed, but cannot be obtained in crystals. From the cold alcoholic solution of elemate of sodium elemic acid is precipitated by carbonic acid. *Elemate of potassium* can be prepared by gently warming the acid with caustic lye containing 10 per cent. of KOH, when at first a jelly is formed. Elemate of potassium, however, separates soon in the solid state from the liquid and can be dissolved in warm water; on cooling the liquid concretes nearly and consists then of needle-shaped crystals. They cannot be submitted to any further purification by recrystallization from either water, alcohol, or ether; all these solvents yield simply a greasy mass, but no distinct crystals. The crystals of elemate of potassium obtained as above stated must be separated from the mother lye by means of the water pump. The adhering trifling quantity of caustic potash is then converted into carbonate, from which it would be possible to separate the elemate by alcohol, but the elemate is then no longer obtainable in the crystallized state. It is decomposed by pure water, forming again a clear solution if very little potash is added

* *Pharm. Journ.*, Aug. 22, 1874, p. 142.

† *Pharm. Journ.*, vii. (Aug. 19, 1876), p. 157.

‡ The Pharmaceutical Society has been presented, by Professor Flückiger, with a specimen of crystallized elemic acid.

the salt is precipitated as soon as a somewhat larger amount of potash is present.

Elemate of potassium when dry is a perfectly white crystalline substance, which cannot be entirely deprived of water over concentrated sulphuric acid, but by heating it at a temperature of from 125° to 130° C. the water is eliminated. This, however, cannot be performed without decomposing the salt; it is, in fact, impossible to make a direct estimation of the water. It was calculated according to the following method:—The elemate being decomposed by warming it with very dilute hydrochloric acid, after cooling the elemic acid was collected in the filter, dried at 100° and weighed, whilst the filtered solution yielded the chloride of potassium.

1. 1·0092 gr. elemate, air-dried, yielded 0·5988 elemic acid $C_{35}H_{56}O_4$, corresponding to 0·5977 acid calculated according to formula $C_{35}H_{55}O_4$. At the same time 0·0856 chloride of potassium was produced. This gives 4·44 per cent. of potassium, combined with 59·22 per cent. of acid $C_{35}H_{55}O_4$.

2. 1·1885 gr. elemate of potassium yielded acid 0·7056 = 0·7043 = 59·26 per cent. of hypothetic acid $C_{35}H_{55}O_4$. On the other hand, 0·0998 KCl was produced = 0·0523 = 4·40 per cent. of potassium. The composition of elemate of potassium is accordingly as follows:—

	I. Analysis	II.		Calculated.	
$C_{35}H_{55}O_4$	59·22	59·26	$C_{35}H_{55}O_4$	539	59·75
K	4·44	4·40	K	39	4·33
18 OH_2	36·34	36·34	18 OH_2	324	35·92
				902	100·00

Elemate of sodium.—It has only been ascertained that is perfectly analogous to the potassium salt, yet seems not to be capable of crystallization.

Elemate of silver, $C_{35}H_{55}O_4Ag$, obtained by mixing an alcoholic solution of elemate of potassium with an aqueous solution of nitrate of silver. The gelatinous precipitate resembling hydroxide of aluminum, displayed a reddish hue; it was dried by pressing it between blotting paper and dissolved in ether, which left behind a very small amount of greyish matter. Elemate of silver as prepared ultimately by evaporating the ether, is white, very light, and on rubbing becoming electric; it is soluble in hot alcohol, but does not afford crystals from that solution. It is not easily altered on exposure to daylight. Before submitting it to analysis it was dried in a current of pure air, deprived of carbonic and hydrosulphuric acids. Its analysis furnished the following results:—

1. 0·5668 elemate of silver gave 0·0945 silver.
2. 0·5785 elemate of silver gave 0·0983 silver.
3. 0·2475 elemate of silver gave 0·0420 silver, 0·5850 CO_2, and 0·1906 OH_2.
4. 0 2282 elemate of silver gave 0·0388 silver, 0·5401 CO_2, and 0·1780 OH_2.

Analysis.	I.	II.	III.	IV.
C	—	—	64·46	64·54
H	—	—	8·56	8·67
O	—	—	10·01	9·79
Ag	16·68	16·99	16·97	17 00

Calculated.

$C_{35}H_{55}O_4$	420	64·92
H_{55}	55	8·50
O_4	64	9·89
Ag.	108	16·69
	647	100 00

By means of the alcoholic solution of elemate of potassium other salts of elemic acid may be obtained; those of the metals are all amorphous. Elemic acid does not combine with ammonium; elemate of ammonium cannot be got in the solid form, although an alcoholic solution of elemic acid, which has become turbid by mixing it with water, is perfectly cleared by ammonia.

An *amorphous resin of acid character* having been mentioned above among the constituents of elemi, it may be pointed out that it appears to be a mixture of at least two substances, inasmuch as it is partly soluble in cold petroleum spirit. The residue dissolves readily in warm petroleum spirit. Neither the latter portion nor the former is able to form crystallizable salts.

In preparing elemic acid as above stated, the *indifferent amorphous resin* remains dissolved in ether. After the evaporation of the ether, a brownish brittle resin remains, which was ascertained to consist of a portion readily soluble in petroleum spirit, the residue being soluble in warm petroleum spirit. On cooling, a viscid mass separates, which when dry is a transparent slightly yellowish mass resembling colophony, but entirely differing from it by not being soluble in caustic lye. It has not been thought of any use to submit the amorphous resins to ultimate analysis, because it is evident that the means are as yet wanting for satisfactorily purifying them. It is scarcely necessary to state here that they form the prevailing amount of the drug as met with in the market, that is to say, the elemi of Manila. Amyrin also occurs in large amount in elemi; not so the acid principles to which the present paper is devoted.

Strassburg University School of Pharmacy,
Laboratory of Professor Flückiger.

AN OINTMENT OF THYMOL FOR RINGWORM.

BY BALMANNO SQUIRE, M.B. LOND.,
Surgeon to the British Hospital for Diseases of the Skin.

Thymol, which has recently been suggested as a more potent destroyer of germs than carbolic acid, seems to me to be capable of somewhat bolder use than it has yet been put to.

I desired quite recently to investigate what influence it might possibly possess as a destroyer of those particular vegetable germs (always so difficult to exterminate), which are the cause of the contagiousness and the persistency of ringworm.

It is not for the purpose of saying whether thymol be efficacious or not in ringworm that I now write; I have not yet arrived at any conclusion on that point. But as it is likely that other practitioners may investigate the properties of thymol as a possible means of treating ringworm, I have thought it may be of interest to pharmacists to know something as to the best mode of preparing an ointment of it.

I observe that in the *Pharmaceutical Journal* for January 26th of this year, a quotation occurs as to the strength in which thymol has been proposed as an external application, namely:—as an aqueous solution of 1 part of thymol in 1000. Now in the case of ringworm, an ointment is a far better form in which to apply the remedy. Then again, ringworm being a remarkably obstinate disease, the question arises, dare we apply the remedy in a stronger form than has been proposed? To this I reply that we unquestionably can do so. I have used thymol ointment containing 1 drachm of thymol to the ounce of lard, without producing irritation of the skin or any other evil effect.

Now as to the best mode of preparing the ointment, I find that the solid crystals of thymol melt at the temperature of a water-bath, and that the liquid thymol is miscible in all proportions with melted lard.

The formula then would stand thus:—

℞ Thymol . . . . ʒj.
Adipis . . . . ℥j.

Melt together at the temperature of a water-bath, stir the two together and allow to cool.

DITAIN.*

Ditaïn is the bitter active (uncrystallizable) principle contained in the bark of *Echites scholaris* (*Alstonia scholaris*, Brown), Apocynaceæ. This species grows wild quite abundantly in the central provinces of the island of Luzon (in the Philippines), where it has long been known and esteemed by the natives (under the name of "Dita") as a most efficient tonic and febrifuge. The people using it from times immemorial in decoction against malignant, intermittent, and remittent fevers with the happiest result, the attention of our leading physicians was excited, and the active principle, ditaïn, has now become a staple article, and *ranks equal* in therapeutical efficiency with the best imported sulphate quinine. Numberless instances of private and hospital practice, carried out by our best physicians, have demonstrated this fact. *Equal doses of ditaïn and of standard quinine sulphate have had the same medical effects;* besides leaving none of the disagreeable secondary symptoms, such as deafness, sleeplessness, and feverish excitement, which are the usual concomitants of large quinine doses, ditaïn attains its effects swiftly, surely, and infallibly.

(*a*) We use ditaïn generally internally, *i.e.*, in quantities of a half drachm (ʒss) daily for infants, and double the dose for adults, due allowance being made, of course, for age, sex, temperament, etc., as thought convenient by the respective medical practitioner. Given internally, our standard (Manila) formula is—

For Infants.

℞ Ditaïn . . . . ½ drachm.
Aq. Flor. Aurant. . . . 5 ounces.
Syr. Citri. . . . . 1 ounce.
S. One spoonful every hour.

For Adults.

Same mixture, but dissolving one drachm of ditaïn.

(*b*) Our medical practitioners use ditaïn as injections in the rectum. In this form experience has suggested—

For Infants.

Ditain . . . . 1 drachm.
Water . . . . 1 pound troy.
Dissolve. For three injections, one every three hours.

For Adults.

Same preparation, only instead of one use two drachms of ditain. Same intervals.

(*c*) We derive very beneficial effects from its use, too, under the form of poultices. Powdered dita bark, corn flour, each half a pound; hot water sufficient to make a paste. Spread on linen, and apply under the armpits, on the wrists and ankles, taking care to renew when nearly dry, and provided the desired effects should not have been obtained.

The extraction and preparation of ditaïn from the bark is analogous to that of quinine. Maceration with acidulated water and precipitation are its leading features. I have obtained from 100 parts of bark, 5 parts ditaïn, 0·85 parts sulphate of lime, and 10 parts extractive matter; the latter, however, of no medical virtue whatsoever.

As dita bark abounds in this country, and its manufacture is an inexpensive one, I hope to make its product acceptable and advantageous even in Europe. So far its cost of manufacture will enable me to lay it down in any part of the world at one-third the price of quinine sulphate, warranted invariably same strength and purity.

I beg now to present the following particulars as to the pharmacological characters, chemistry, etc., of the bark:—

The tree grows to a height of fifty feet or more, and can be peeled with impunity. The active principle therefrom obtained is a dark green powder, very hygroscopic, easily soluble in water, but not in absolute alcohol or ether. From the researches of Gorup-Besanez, it appears to contain a crystallizable substance, the alkaloid.

"The pieces of bark, as circulating in trade, are 0·04—0·06 met. long (0·025 metre = 1 inch Engl.), 0·015 m. broad, and 0·001—0·004 thick. They are bent irregularly, present on the exterior a thin leather-brown layer (kind of cork), and a good many longitudinal and transversal fissures, which make the bark look scaly. Very often the edges of the fissures are raised with the corky layer, and the transversal cracks themselves filled, whole or partially, with a colourless cellular tissue.

"The bark is of moderate hardness, and breaks easily, young bark giving fibrous, and old granular fragments.

"The interior of the bark is slightly indented, and presents the appearance of depressed meshes, sometimes longitudinally fibrous. The colour from leather-brown to dark grey, dotted very frequently with black specks and points. Lichen is quite seldom on it. When ground, the bark furnishes a yellow-grey powder, which is inodorous. In chewing it communicates only gradually to the palate a slightly bitter but not disagreeable taste. The cellular tissue of the bark shows, under the microscope, crystalline deposits (oxalate of lime).

"The aqueous extract is dark yellow, clear on cooling, pleasantly bitter, and suffers no alteration with ferruginous salts. Though sugar of lead throws down a precipitate from the decoction, there is another one formed in the filtered liquid through the addition of basic acetate of lead. This latter precipitate is copious and amorphous. After filtering and eliminating all the lead, the active bitter principle of the bark can be thrown down with phosphowolframic acid from the neutral solution.

"Ether, chloroform, and petroleum essence only withdraw from the bark indifferent extractive matter; boiling alcohol is the most efficient solvent. Potassic lye colours the bark yellow. Diluted muriatic acid, especially when heated, dissolves large amounts of oxalate of lime.

"Dried at 100° Cels., the bark loses 12·7 per cent. moisture, and incinerated leaves 10·4 per cent. of a white ash, chiefly lime.

"Treating the precipitate obtained by phosphowolframic acid with aq. barytæ in excess with ether and acetic acid, the analysts obtained an alkaloid which they called 'ditamin,' and which amounted to about 0·02 per cent. of the bark employed. It is a white amorphous powder, slightly bitter, easily soluble in ether, chloroform, benzine, and alcohol. From petroleum spirit, in which it seems to be less soluble, it may be obtained crystallized. Concentrated sulphuric acid dissolves it, cold, with reddish colour, warm, with violet. In concentrated nitric acid it is soluble, turning the solution yellow; and on heating the liquid it first grows dark green, afterwards orange, evolving red vapours. Heated in a capillary tube, it melts, forming at 75° a light yellowish, and at 130° a deep brownish-red liquid. Its alcoholic solution is alkaline and capable of neutralizing strong acids, thereby forming salts remarkable for their extreme bitterness. Its chlorhydrate leaves, on evaporation, a

* From the 'Report on Centennial Exhibition,' presented to the American Pharmaceutical Association ('Transactions,' 1877).

residue which, though amorphous, indicates some tendency to crystallization. Only once, under circumstances unknown to the operator, it formed nice colourless needles, which were easily soluble in alcohol and water. This last (aqueous) solution presented the following reaction: with—

"Chloride of platinum, $PlCl_3$, yellow amorphous precipitate, somewhat soluble on heating.

"Chloride of gold, Au_2Cl_3, dirty yellowish amorphous gelatinous precipitate, easily melting to a brown oily liquid.

"Bichloride of mercury, HgCl, white amorphous precipitate, soluble on heating in the supernatant liquid, and depositing, on cooling, in small watery groups.

"Double iodide of mercury and potassium, HgIKI, white amorphous precipitate, very little soluble in cold, but easily in hot water.

"Perchloride of iron, Fe_2Cl_3, no alteration.

"Iodide of potassium, KI, from concentrated solutions, produces an amorphous precipitate, easily soluble in water, and barely so in solution of iodide of potassium.

"Rhodanide of potassium, KCyS, from concentrated solutions, a white amorphous turbidity, which disappears on further dilution.

"Tannin, a white gelatinous precipitate.

"Phosphowolframic acid, abundant white precipitate.

"The ultimate organic analysis could not be undertaken, owing to lack of material.

"If the bark be digested with petroleum spirit, there results a resinous body, which, after having been purified, is but sparingly soluble in boiling alcohol, but easily so in chloroform, ether, petroleum spirit, and benzine. The analysts call this body 'echicaoutchin.' It is not acted upon by a potassic lye; if heated, it melts first, and then burns off easily and completely. Under tepid water it may be drawn out to long silky fibres. If the water be more than lukewarm, the substance loses its elasticity, but recovers it again at a lower temperature. The results of the ultimate analysis correspond with the formula, $C_{25}H_{40}O_2$.

"If the concentrated extract of the bark obtained with petroleum spirit (see above) be boiled with alcohol, there separates an oily liquid, which soon solidifies, and superincumbent there forms a copious layer of white crystals, which the analysts found to contain two new substances, viz., echicerin and echitin. Treating the former with sodium, they obtained its acid, analogous in composition, which they called echicerinic acid. Echitin is a neutral body, and crystallizes in tender white scales. Evaporating the alcoholic solution left over from echicerin and echitin, another neutral body, echiteïn, crystallizes out; bromine converts it in tribromechiteïn; and lastly the alcoholic mother liquors give a resinous substance called echiretin. Along with ditamin the analysts discovered another body, which is also precipitated by phosphowolframic acid, equally bitter, but offering in some respects only the essential qualities inherent to an alkaloid or vegetable base. A fuller investigation of this body could not be effected, through lack of material. The amount of all the resinous and oleo-resinous bodies, echicaoutchin, echicerin, $C_{30}H_{48}O_2$, echitin, $C_{32}H_{58}O_2$, echiteïn, $C_{42}H_{70}O_2$, and echiretin, $C_{35}H_{56}O_2$, along with another undetermined resin, is, together, 2·95 per cent. of the bark.

"Echiretin offers a great deal of similarity with a resin extracted by Heintz from the juice of the cow tree, another tree growing wild in the Guianas—*Tabernæmontana utilis*. In composition, but not in its properties, it is identical with lactucarin. The analysts are of opinion that it is isomerous with said body, as well as with camphor obtained from cubebs.

"It would appear that ditamin was also the body which Mr. De Gorup-Besanez obtained from ditaïn, but which he could not investigate further owing to lack of material. This much, however, seems to be certain, that the dita bark does not contain notable quantities of an alkaloid, properly so called, and that the febrifuge properties of the bark, as well as of the extract, can hardly be attributed to the very limited amount of alkaloid contained therein.

"In conclusion, we would say that the results arrived at by ditaïn in our Manila hospitals and private practice are simply marvellous. An octogenarian mestizo, suffering from typhoid fever, was cured by the application of six grams. A Spanish officer, subject for a long time back to persistent attacks of malarious fever, was treated six times a day with clysmas (injections in the rectum), each of 0·2 gram ditaïn; in three days he was well. Its tonic effects are unrivalled. In our military, hospital, and penitentiary practice, ditaïn has perfectly superseded quinine, and it is now being employed, with most satisfactory results, in the island of Mindanao, where malignant fevers are prevalent."

PREPARING PLASTER CASTS THAT CAN BE WASHED.*

The prize offered by the Prussian Minister of Commerce and Industry for a method of preparing plaster casts that permit of being washed was conferred upon Dr. W. Reissig, of Darmstadt. From Dr. Reissig's essay on the subject we abstract the following points:—

In preparing these casts it is not only desirable to obtain a surface which should not wash away, but also to include a simple process for preventing dust entering the pores and render them more easily cleansed. Laborious experiments convinced this gentleman that the only practical method of accomplishing this and retaining the sharpness of outline was to convert the sulphate of lime into (1) sulphate of baryta and caustic or carbonate of lime, or (2) into silicate of lime by means of silicate of potash.

Objects treated in this way are not affected by hot water or hot soap solutions, but, from the method of preparation, they remain porous, catch dust, etc., and when first put into water eagerly absorb all the impurities. To avoid this evil he subsequently coats the articles, now rendered waterproof, with an alcoholic soap solution, which penetrates more easily, deeper, and more freely into the pores than an aqueous solution. After the alcohol evaporates a layer of soap remains, which fills the pores, and when washed it is converted into a suds which removes the dust, without allowing it to penetrate.

1. *Process with Baryta Water.*—This is the simplest, easiest, and cheapest method. It depends upon the fact that gypsum, or sulphate of lime, is converted by baryta water into sulphate of baryta (which is totally insoluble), and caustic lime, which is converted by contact with the air into carbonate of lime. The practical method of carrying this out is as follows:—A large zinc vessel is required with a tight-fitting cover. In each vessel is a grating made of strips of zinc, resting on feet $1\frac{1}{4}$ in. high. This vessel is two-thirds filled with soft water at 54° to 77° Fah., and to every 25 gallons of water is added 8 lb. of fused or 14 lb. of crystallized, pure, hydrated oxide of barium, also 0·6 lb. of lime previously slaked in water. The solution stands about 4° Beck. As soon as the baryta water gets clear it is ready to receive the casts. They are wrapped in suitable places with cords, and, after removing the scum from the baryta bath, are dipped in as rapidly as possible, face first, and then allowed to rest upon the grating.

Hollow casts are first saturated by rapid motions, then filled with the solution and suspended in the bath with the open part upwards. After the cords are all secured above the surface of the liquid, the zinc vessel is covered. The casts are left in it from one to ten or more days, according to the thickness of the waterproof strata re-

* *Industrie Blatter*; reprinted from *Design and Work*, January 5, 1878

quired. After taking off the cover and removing the scum, the plaster casts are drawn up by the strings, rinsed off with lime water, allowed to drain, carefully wiped with white cotton or linen rags, and left to dry, without being touched by the hands, in a warm place free from dust. The same solution which has been used once can be used again by adding a little more baryta and lime.

Of course this process can only be applied to casts free from dust, smoke, dirt, coloured particles of water, resin and varnish, soap, animal glue from the moulds, or sweat from the hands. To prevent the casts getting dust upon them, they should be wrapped in paper when taken from the mould, and dried by artificial heat below 212° Fah. If, in spite of every precaution, the casts when finished show single yellow spots, they can be removed in this manner: The perfectly dry, barytated casts, saturated with carbonic acid, are painted over with water and oil of turpentine, then put in a glass case and exposed to the direct rays of the sun. All spots of an organic nature will then disappear; but of course rust, smoke, and mineral spots cannot be removed in this way.

In the place of cold baryta water the casts may be placed for half an hour in a concentrated solution of baryta heated at 104° to 122° Fah. This has the advantage that casts may be put in before drying. As the casts treated in this way are not hardened very deeply, and are still porous, it is well to place them subsequently in a cold bath for a longer time.

The casts are now ready, as soon as perfectly dry, for the soap solution. For cheapness a pure, good, hard soap is selected, shaved up, dried and dissolved in 50 or 60 per cent. alcohol; 10 or 12 parts of alcohol to one of soap. Such a solution of Marseilles soap, known as "spiritus saponatus," can be had at any drug store. The finest appearance, as well as a high degree of durability, is obtained by the use of a solution of stearate of soda in strong alcohol. Both the solution and cast should be warm, so that it may penetrate as perfectly and deeply as possible. It is no harm to repeat the operation several times, as long as the liquid is absorbed by the cast. When dry the cast is finished.

2. *Process with Silicate of Potash Solution.*—This process depends upon the conversion of the sulphate of lime into silicate of lime, an extremely hard, durable, insoluble compound, and is accomplished by the use of a dilute solution of silicate of potash containing free potash. To prepare this solution Dr. Kessig first makes a 10 per cent. solution of caustic potash in water, heats to boiling in a suitable vessel, and then adds pure silicic acid (free from iron) as long as it continues to dissolve. On standing, the cold solution usually throws down some highly silicated potash and alumina. It is left in well-stoppered glass vessels to settle. Just before using, it is well to throw in a few bits of pure potash, or to add 1 or 2 per cent. of the potash solution. If the plaster articles are very bulky, this solution can be diluted to one half with pure water.

The casts are silicated by dipping them (cold) for a few minutes into the solution, or applying the solution by means of a well-cleaned sponge, or throwing it upon them as a fine spray. When the chemical reaction, which takes place almost instantly, is finished, the excess of the solution is best removed with some warm soap water or a warm solution of stearin soap, and this finally removed with still warmer pure water.

The casts, which can be immersed or easily moved around, may be treated as above when warm; a very short time is required, but some experience is necessary. In every case it is easy to tell when the change is effected, from the smooth, dense appearance and by its feeling when scratched with the finger nail. It is not advisable to leave them too long in the potash solution, as it may injure them. A little practice renders it easy to hit the right point. The fresher and purer the gypsum, and the more porous the cast, the more necessary it is to work fast. Castings made with old and poor plaster of paris are useless for silicating. These silicated casts are treated with soap as above.

In washing plaster casts prepared by either method the author recommends the use of a clean soft sponge, carefully freed from all adherent sand and limestone, wet with lukewarm water and well soaped. They are afterwards washed with clean water. They cannot, of course, be washed until thoroughly dry and saturated with carbonic acid. The addition of some oil of turpentine to the soap is useful, as it bleaches the casts on standing. The use of hot or boiling soapsuds must be avoided.

NOTE ON MATÉ OR PARAQUAY TEA.*

(*Ilex Paraguayensis.*)

BY DR. H. BYASSON.

The author having been requested by Professor Gubler to examine a specimen of "maté" or "Paraguay tea," has recently presented to the Paris Academy of Medicine a note containing a *résumé* of the principal facts previously known respecting this product, together with some observations as to its chemical composition. The following is an abstract of this note.

Maté constitutes, throughout a great part of South America, the favourite drink of the inhabitants, who attribute to it innumerable virtues. The word "maté" originally designated the vessel in which the infusion was prepared; the maté tree is known as the *Arvore do Congonha.* The tea itself is sold under three different names, each indicating a commercial variety.

(1) *Caa-Cuyo* ("*caa*" signifies a leaf): consisting of buds scarcely expanded. It is consumed in the locality where gathered.

(2) *Caa-Miri*: prepared by the Jesuits from the dried leaves, carefully cleansed and powdered.

(3) *Caa-Gazu*: prepared by the natives from the leaves, roasted and coarsely powered. This was the variety examined; it contained also fragments of petioles and young shoots. The powder was greenish yellow, and had a slightly aromatic odour which was developed by contact with water.

The tree which yields the maté is the *Ilex Paraguayensis* or *Ilex Maté.* It was first described by A. Saint-Hilliare, who found the "*arvore do congonha,* or "*arvore do maté*" growing abundantly in woods near Carabita in Brazil. During his second voyage he established the identity of this Brazilian plant with the Paraguayan plant, he having met with the "*arvore do congonha*" in the quincunces of trees planted by the Jesuits in their ancient mission stations in Paraguay. Under the name *congonha,* however, have been also designated very different plants, belonging to the genera *Luxemburgia, Vochysia,* and *Trimeria.* The *Ilex Paraguayensis* grows in the wild state in the woods bordering the rivers and water-courses running into the Uruguay and Paraguay rivers. It there occurs as large as an apple tree, which it somewhat resembles in figure; but when cultivated and the leaves are regularly collected, the plant remains as a shrub. The trunk of the tree is as thick as a man's leg; the bark is whitish and shining, and the branches and all other parts of the plant have a velvety appearance. The leaves, which have a very short petiole, are simple, cuneiform, obovate or oblong-lanceolate, dentate, shining, coriaceous, and about 1 to $1\frac{1}{2}$ inches long. The flowers are white, as large as those of the common holly, grouped in a dichotomous and trichotomous axillary inflorescence. Each flower has a calyx with four suborbicular concave sepals, a corolla with four petals, and four stamens with very short filaments; the ovary is surmounted by a four-lobed stigma. The fruit is a red drupe the size of a peppercorn, containing four striated seeds.

* *Répertoire de Pharmacie et Journal de Chimie Medicale,* N.S., vol. i., p. 11.

The leaves are collected every two or three years, that interval being required for them to attain their full growth; the branches are cut off with their leaves and they are dried altogether over a large fire. The leaves are then detached, sorted, and placed in large baskets where their drying is finished. After about a month the leaves are powdered and are then ready for the market.

An infusion of the tea is prepared in a kind of cup (*maté*), made frequently of a calabash mounted with silver. Some persons add to the beverage a little burnt sugar or a few drops of lemon juice. The liquid is sucked up through a tube, called a "bombilla," at the lower part of which are several small holes, which do not allow the passage of the fragments of leaf. The leaves can be used three times, but the infusion alters rapidly.

After some qualitative experiments, M. Byasson proceeded with the analysis as follows: 100 grams of maté were intimately mixed into a paste with 25 grams of slaked lime, and the mixture was dried slowly in a stove at 75° C. It was then exhausted successively with (1) 600 c.c. of chloroform; (2) 600 c.c. of 95° alcohol; and (3) sufficient distilled water to remove the alcohol as much as possible. The chloroform solution, of a green colour, was distilled; the dried residue, which was brown and contained crystalline needles visible to the naked eye, was treated several times with distilled water, upon slow evaporation of which a yellowish white substance was obtained that, redissolved in alcohol, gave after evaporation and cooling a nearly white crystalline mass. Previous experiments had indicated that this was caffeine and the product was sublimed to obtain a better crystallization. The caffeine obtained from the 100 grams of maté weighed, after crystallization from alcohol, 1·850 gram; after sublimation, 1·734 gram, a small quantity being destroyed by sublimation.

The residue from which the caffeine had been extracted was dried over sulphuric acid. It formed a greenish brown substance, resembling in consistence the birdlime extracted from the common holly, but less elastic and darker in colour. This glutinous substance dissolves in all proportions in ether; it becomes nearly liquid at 80°, and it burns with a white fuliginous flame. Strong solution of potash attacks it with difficulty. Attempts to purify it and determine its chemical character were not successful on account of the small quantity operated upon and especially the difficulty in removing the green colouring matter with which it is impregnated. The following experiment indicates that it must be considered to be a fatty body or compound ether, the alcohol of which would be near to cholesterine. Two grams were submitted to the prolonged action of a hot alcoholic solution of potash, care being taken to replace the alcohol evaporated. After two hours the glutinous matter appeared to be completely transformed and yellowish white flocks floated in the liquor. The alcohol having been driven off by evaporation and the residue taken up with ether, the ethereal solution left upon evaporation a nearly white substance in crystalline scales, resembling but without being identical with those of cholesterine. The portion insoluble in ether, treated with water acidulated with hydrochloric acid, gave a white fusible substance, soluble in alcohol and in alkaline solutions.

The alcoholic liquor, which was of a slightly greenish yellow colour, was distilled to remove the alcohol and the residue treated with distilled water. A yellowish white substance that floated to the surface of the liquid was separated on a filter, washed with water, and redissolved in absolute alcohol. It presented all the characters of a resin; it had neither taste nor odour, and by dry heating it yielded a spongy charcoal, and a small quantity of brown acid liquid, having an acrid taste. The evaporation of the water left a substance difficult to dry completely and not showing any trace of crystals. Again treated with absolute alcohol it dissolved completely. The alcohol deposited an amorphous substance, nearly white, with an aromatic odour recalling that of the plant and a scarcely acid reaction, but presenting none of the characters attributed to caffetannic acid and noticed in maté by Rochleder. Caffetannic acid was also sought for by precipitating an aqueous infusion of maté with acetate of lead, but the result was negative. The preceding substance boiled in water, slightly acidulated with sulphuric acid, developed the markedly aromatic odour of the plant, whilst the solution reduced the cupro-potassic liquor freely. After some hours it became strongly coloured, and deposited brown flocks.

The aqueous infusion of 100 grams of maté, slightly acidulated with sulphuric acid, heated and then decolorized by acetate of lead, was dextrogyre.

These characters proved that the substance isolated was a complex glucoside, the decomposition of which yielded glucose and a compound to which the plant owes its characteristic odour.

100 grams of maté exhausted by a litre of boiling distilled water yielded 24 grams of dry extract. The precipitate produced in aqueous infusions by basic lead acetate was washed with cold water and redissolved in boiling water. The filtered solution deposited upon cooling slender crystals of a salt presenting all the characters of malate of lead; particularly those of fusion and of yielding a pitchy mass by the action of a quantity of water insufficient to dissolve it. The tests for tannin gave negative results.

Incineration of the extract yielded a proportion of ash equal to 3·92 per cent. of the maté used. The ash contained carbonate of potash; it was rich in sulphuric acid, and iron was present in weighable quantity.

The 100 grams of maté yielded—

Caffeine	1·850 grams.
Glutinous substance, or peculiar fatty matter and colouring matter . . .	3·870 ,,
Complex glucoside . . .	2·380 ,,
Resin	0·630 ,,
Inorganic salts, including iron	3·920 ,,
Malic acid	Not estimated.

The relative proportions of caffeine or theine contained in different sorts of coffee or tea (*Thea Chinensis*) determined by Stenhouse amounted to 1·37 per cent. in the richest tea, 0·20 per cent. in coffee, and a still smaller proportion in maté. These figures do not agree with those obtained by Robiquet, Payen and Mulder, and agreement is scarcely possible with specimens from different sources analysed by different methods. But Paraguay tea analysed by the author as described contained an amount of caffeine comparable with that in the kinds of coffee and tea richest in that alkaloid.

PURIFICATION OF VALERIANIC ACID.*

According to Lescœur, valerianic acid prepared from fusel oil is frequently contaminated with homologous acids, as well as with amyl valerianate. To remove these, the author recommends to dissolve in two equivalents of the crude acid, one equivalent of neutral sodium valerianate, by gentle heat. On standing in a cool place, the solution deposits crystals of sodium tri-valerianate, which are dried upon porous plates, and finally by pressing between blotting-paper. These yield, on distillation with sulphuric acid, a perfectly pure valerianic acid, provided that anything which distils over below 260° and over 280° F. is rejected.

* *Chem. Centralb.* From *New Remedies*, January 1878.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 2, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE MUSEUM OF THE PHARMACEUTICAL SOCIETY.

THE appearance of a Catalogue, numbering three hundred pages, of the Collections in the Museum of the Pharmaceutical Society of Great Britain, affords an opportunity for referring specially to the past history and present position of one of the most important and interesting aids to the study of materia medica existing in this or any other country. Probably only a small proportion even of the members of the Society have an adequate conception of the results that have followed the work of a comparatively short time in collecting and arranging specimens of substances used in medicine from all parts of the globe.

It is just thirty-six years since the Museum was first described, rather quaintly, in this Journal. It was then a front room on the ground floor, containing not a vestige of furniture. The bare boards were well scoured, the ceiling and walls were in a perfect state of repair, but there was not in it even a chair or a table. On the floor, in one corner was a small heap of brown paper parcels, containing a few donations from two or three members, and on the mantelshelf were about a dozen glasses and bottles in which were sundry crystals, roots, and other substances. But these formed the nucleus of what is now perhaps the finest and most complete collection of materia medica in the world. Four months afterwards, at the first Annual Meeting of the Society, the Council was able in its Report to state that two cases for the Museum were in course of erection. It was not, however, until August, 1842, that the announcement was made that glass cases and jars were ready for the reception of specimens, and the first list of donations was published in the October following. The list was a long one, and amongst the donors were men whose names will be long held in reverence among British pharmacists.

The original proposal was that the Museum should contain a specimen of every substance contained in the materia medica, which is capable of preservation, in the highest possible state of perfection and purity, and by the side of this was to be placed a specimen of inferior quality, in order that the student might learn to exercise his judgment in the choice of drugs. This plan has not been since uniformly adhered to, but its importance in the eyes of the early managers of the collection may be inferred from a curious statement published the following month, that the most acceptable donations to the Museum would then be specimens of drugs of inferior quality to exhibit in contrast with the fine specimens already received. At the Second Annual Meeting the Council was able to report that the Museum contained eight hundred and fifty specimens, more than five hundred of which had been presented to the Society. Since that time the history of the Museum has been one of steady progress, continual additions of specimens being made by gift or by purchase; but we feel warranted in saying that at no period has its advance been more marked than since it has been under the management of its present able and energetic curator, Mr. HOLMES, to whose labours we are mainly indebted for the catalogue now published.

Perhaps these columns would hardly be the place to enter into any elaborate eulogy of this publication, but it may be remarked that it is a great deal more than its title implies. It is not only a systematic catalogue of all the substances exhibited in the principal collections in the Museum, but it is interspersed with numerous short though valuable notes, which also contain a considerable number of bibliographical references. A copious index of names and synonyms is added, so that in seeking for information respecting any particular substance not only will its place in the Museum be ascertained by an easy process of reference, but appended to the entry will be frequently found some useful practical information respecting it, as well as indications as to where fuller details may be looked for. The Catalogue is divided into three sections, the Vegetable Materia Medica, the Chemicals, and the Animal Materia Medica. The first section is grouped under natural orders, following the arrangement adopted in BENTLEY'S 'Manual of Botany.' The Chemicals are grouped as Inorganic and Organic Compounds, and again suitably subdivided. In the Animal Materia Medica the classification generally accepted in this country is adopted. It is, we understand, intended to number all the specimens to correspond with the numbers in the Catalogue, and to indicate those of them that are official.

It may be useful to state that the principal general collection, to which this Catalogue alone refers, is intended to represent every substance that is official in the British, United States, and Indian Pharmacopœias, and also such as have been the subjects of papers contributed to this Journal. There are, however, besides these several special collections, which it is intended to catalogue at a future time. Of these may be mentioned the HANBURY Collection and Herbarium, a Collection of Old English Drugs, one of Indian Drugs, including those presented by Professor DYMOCK, as well as others of Australian, South American, North American, African, and Chinese Drugs. There is also a very complete collection of barks. Lastly, there is a general herbarium. All these collections are continually, and often profitably, consulted by persons who have proved their value, but not by so large a number as would probably avail themselves of the advantage were their existence and nature more generally understood amongst pharmacists. We hope, therefore, and we have little doubt, that the publication of the new Catalogue will exercise a salutary influence in this direction.

We suppose the issue of the Catalogue will come under the consideration of the Council at its next meeting, and that in a few days we shall be in a position to state what are the terms upon which it will be supplied to those who desire to possess copies.

THE FIRE AT A CHEMIST AND DRUGGIST'S.

We regret to announce that Mr. Frederick Sadler who, as was mentioned in these columns last week, was severely burnt while endeavouring to extinguish the fire which occurred at his shop, in George Street, Tamworth, died from the effects of his injuries on the 22nd. Mr. Sadler was well known in Tamworth and neighbourhood, where he had won the respect and high estimation of all classes, and universal regret was felt when it became known that his injuries had resulted fatally. The deceased leaves a widow and four children.

DEATHS OF MM. REGNAULT AND BECQUEREL.

France has within a few days lost two of her most eminent men of science, Antoine-César Becquerel and Victor Regnault, who died, the former on the 18th, and the latter on the 19th of January. M. Becquerel was the Professor of Physics at the Jardin des Plantes, and was well known by his investigations in the science of electricity, especially in that branch of it which he called "*électrochimie*," for which in 1837 he was awarded the Copley medal by the Royal Society of London. At the time of his death he was just ninety years of age, and in 1874 he was presented with a medal to commemorate the completion of fifty years of membership of the Academy of Sciences. M. Regnault was also best known as a physicist, but the earlier part of his career was devoted to chemistry, and for some time he was Professor of Chemistry at the Polytechnic School, during which period he published his well-known *Traité de Chimie*. He subsequently became Professor of Physics in the College of France, and eventually Director of the manufactory at Sèvres. M. Regnault died after a long illness at the age of sixty-eight. Upon the announcement of the death of these eminent men at the succeeding meeting of the Academy of Sciences the sitting was immediately adjourned as a mark of respect to their memory.

THE EVENING MEETING.

An Evening Meeting of the Pharmaceutical Society will be held on Wednesday next, February 6th, at 17, Bloomsbury Square, when the following papers will be read:—"On the Progress of Cinchona Cultivation and Alkaloid Production in Bengal," by Mr. C. H. Wood; "Examination of Commercial Oil of Tuyme," and "Thymol and its Pharmacy," by Mr. A. W. Gerrard; and "A Spurious Balsam of Tolu," by Mr. W. A. H. Naylor.

Provincial Transactions.

COVENTRY AND WARWICKSHIRE PHARMACEUTICAL ASSOCIATION.

The opening meeting of the above Association took place on the evening of the 9th inst. in the Assembly Room, Agricultural Hall, Coventry. The President (Mr. Councillor Wyley) occupied the chair, and there were present about one hundred and twenty gentlemen connected with the medical, pharmaceutical, and scientific professions. Along the sides of the large room were placed tables, upon which were tastefully arranged specimens of new drugs, rare chemicals and alkaloids, pharmaceutical apparatus, microscopes, radiometers, materia medica cabinets, geological specimens, etc., the principal exhibitors being Messrs. Hopkin and Williams, Gerrard, Evans, Lescher and Evans, Pfleiderer, Silverlock, Davis, Hinds, etc.

The President having briefly opened the meeting, the minutes of the introductory meeting establishing the Association were read and confirmed; the rules as amended by the Council were approved of and ordered to be printed for circulation.

The Hon. Secretary then read the following list of donations:—Mr. Thomas Hyde Hills, five guineas; Messrs. Wyleys and Co., five guineas; Mr. Henry Silverlock, five guineas; Messrs. Burgoyne, Burbidges and Co., two pounds; Messrs. Alderman Bates, Councillors Sellors, Bird, Jenkins, Hiscock, Barton, Welton, Clarke, Williamson, Whiting, Fletcher, Wisher, and Barrett, one guinea each; the Pharmaceutical Society, current copies of the *Pharmaceutical Journal* and the 'Calendar' and 'Register;' Mr. John Williams (President of the Pharmaceutical Society), an excellent Portrait of himself for the Library, Bloxam's 'Chemistry,' and Royle's 'Materia Medica;' Mr. T. Hyde Hills, valuable Framed Portraits of John and Jacob Bell, William Allan, and Dr. Pereira; Mr. S. U. Jones, (President of the Trade Association), his Portrait and Attfield's 'Chemistry;' Professor Attfield, Attfield's 'Chemistry;' Professor Balfour, 'Manual of Botany;' Professor Bentley, 'Manual of Botany;' Professor Frankland, 'Lecture Notes to Chemical Students,' vol. ii.; Professor Odling, 'Animal Chemistry,' 'Outlines of Chemistry,' and Odling's 'Chemistry;' Professor Tuson, 'Veterinary Pharmacopœia;' Messrs. Howard and Son, a Collection of excellent Specimens of East Indian Red Cinchona Bark in Glass Jars; Dr. John Muter, F.C.S. (Director of the South London School of Pharmacy), 'Elements of Chemistry;' Dr. Morel Mackenzie, 'Throat Hospital Pharmacopœia;' Dr. Tilden, F.C.S., 'Chemical Philosophy;' Dr. Thorowgood, 'Notes on Asthma;' Dr. Stevenson, Naquet's 'Modern Chemistry;' Messrs. Evans, Lescher and Evans, a Cabinet of Materia Medica Specimens; Messrs. Southall, Brothers and Barclay, a Cabinet of Materia Medica Specimens and Vegetable Materia Medica; Messrs. Burgoyne, Burbidges and Co., the *Monthly Magazine of Pharmacy*, etc.; Messrs. Barnard Proctor, 'Practical Pharmacy;' F. Harwood Lescher, 'Elements of Pharmacy;' G. S. V. Wills (Principal of Westminster College), 'Elements of Pharmacy' and 'Elements of Materia Medica;' J. Tully, Six Pamphlets on Examination Topics and an Herbarium; W. Southall, Materia Medica; E. Kensington, 'Food Analysis;' Bird, Books; Bambridge, Collection of Fossils and two Ancient Pharmacopœias, etc.

Votes of thanks having been very heartily passed to the several donors, the Hon. Sec. (Mr. F. J. Barrett, F.C.S.) proceeded to give a short statement of the affairs of the new Association. He said that it was a matter of congratulation to the Council that their project had been so warmly taken up. Mr. Whiting (the Deputy Treasurer) had very kindly canvassed the chemists of Coventry and immediate neighbourhood, and he was pleased to say he had not met with a single refusal. He had also been to several of the adjacent towns, and with but few exceptions the formation of their society was applauded and numerous promises of help had been received. He saw no reason why they should not have very successful evening meetings in Leamington, Warwick, Rugby, and other towns, so that the Association, with head-quarters in Coventry, should really be a county affair. The Council had not yet secured suitable central rooms, but they hoped in the course of a few days to be able to announce having done so. The classes for the "Preliminary" and "Minor" examinations were in process of formation, several gentlemen, including three passed pharmaceutical students, had volunteered to conduct the latter classes, and an efficient master would be engaged for the former as soon as suitable rooms could be obtained and a sufficient number of students had entered. Special instruction would also be given to those preparing for the higher examination. With regard to the evening meetings, he had the pleasure of announcing that Mr. Stokes Dewson had promised to give them a lecture in February; Dr. Iliffe would address them in March on "Contagion"; Mr. Bambridge and Mr. Axford would also read papers on "Tobacco" and "Oleic Acid and its Combinations," at some future time, particulars of which would be given in due course. He then announced that the Hon. Sec. of the Midland Counties Association had written to invite members to the *soirée* on the 23rd inst, and he hoped that as many as possible would make it convienent to attend. It was with great regret that he had to announce that two of the members of the Council, elected at their opening meeting (Messrs. Phillips and Hinds) had, on account of business engagements, been compelled to withdraw, but they had both written expressing their willingness to assist in every possible way in forwarding the objects the Council had in view. At the close of the Secretary's report, Messrs. Barton (Kenilworth) and Davis (Leamington) were unanimously elected to fill the vacant seats.

The opening address was then delivered by the President (Mr. Counciller Wyley). He commenced by stating that he could not, owing to the very recent establishment, refer to the work that had been accomplished by them during the past year, but he would instead briefly glance at recent pharmaceutical introductions, and speculate upon the duties to be accomplished in the future. Mr. Wyley then referred to the good that had been done by the recent formation of an organized fellowship of chemists for their defence against unjust and vexatious legislation, under the name of the Chemists' Defence Association.

Humorously alluding to the break-down of the absurd milk of sulphur prosecutions, Mr. Wyley warmly commented upon the action of certain official analysts in recommending such paltry prosecutions, and in a few cases misleading the adjudicating magistrates by the use of "sensational" terms; instancing the "Sweet Nitre," "Citrate of Magnesia," Scammony, and Copaiba cases. He said that in many instances the evidence of the food analyst disclosed his utter ignorance of the ordinary mode of testing drugs for impurities, showing his incapability of filling a position that should be occupied by highly and specially trained pharmaceutists. Such actions were grave scandals against the satisfactory working of an important and necessary Act of Parliament. It was no light matter for an upright chemist to be dragged before a bench of magistrates and branded as a dishonest tradesman and a cheat. The chemists of Great Britain stood high in the scale of trade morality and it was incumbent upon them all to guard with jealous care any action which would tend to lessen the status of their profession.

Mr. Wyley then reviewed the vexed question of "counter prescribing," and said that although they could have no sympathy with the man, who, for purposes of mere gain, would undertake the treatment of complicated diseases or even simple disorders, the character of which he did not understand, still it would be an insult to common sense to forbid the dispensing chemist to give suitable mixtures for such trifling ailments as a cough, or cold, or temporary indigestion. Such action would be a grave injustice to the working man or petty tradesman who depended upon the chemist for advice in small matters, and called in the doctor when it was necessary. It would be simply opening the door to uneducated quacks who could legally vend their patent medicines under government patronage, or would tend to pauperize him, and insult his dignity by forcing him to apply at the hospital for gratuitious advice.

The speaker then, in an able *résumé*, commented upon the recent scientific and pharmaceutical introductions to materia medica. Guarana, jaborandi, carnauba root, caroba leaves, "yerba santa," damiana, tayuya, grindelia robusta, boldo, coca leaves, coto bark, hamamelis root, "yellow jasmin," eucalyptus, xanthium spinosum, and curara were described and their preparations fully spoken of. The mode of manufacture of hydrobromic acid, dialysed iron, carbolated camphor and iodine, vaseline and its rivals cosmoline and unguentum petrolei, salicylic acid and preparations, monobromated camphor and many other pharmaceutical introductions were noticed and their composition and mode of preparation explained. The President said that these were some of the new weapons added to the armoury of materia medica, and that as faithful superintendents of this armoury it was their duty always to be in readiness to assist those who defended them from the invasion of death and disease, the members of the most noble professions on earth, medicine and surgery.

Mr. Wyley then continued. In conclusion, a few words with reference to the future of our newly-formed Association. You have done me the honour of making me its first president, and I shall feel it not less a duty than a high privilege to use every effort to ensure its success, and make it a means of promoting the education and scientific advancement of its members.

To you younger members of the Association—the Pharmacists of the future—I would specially point out the necessity of taking advantage of the means of improvement which are now offered to you.

If you would make your mark in the profession to which you belong, it is specially needful that you keep abreast of the times in pharmaceutical knowledge. A Spanish proverb tells us, in the kingdom of the blind the one-eyed man is king, but now-a-days there are fewer and fewer blind pharmacists, hence he who would reach regal rank must have eyes, and more than this, have learnt the power of using them. A little knowledge, perhaps, now more than ever, is a dangerous thing. He is an unwise tradesman who places all his stock in the shop windows, and the same epithet belongs to the student who, by means of cram, manages to obtain just sufficient information to pass his examinations, but has no surplus stores of knowledge to fall back upon. Put all your energies and strength, in fact, put yourselves into your daily work, and cast away the mistaken notion that doing your duty can ever be degrading, thus only can—

"Work be made worship
And e'en drudgery divine."

And if we all in such a spirit as this, whether senior or junior members, are able to enter thoroughly into the means of improvement which will now be within our reach, we shall assuredly have no reason to regret the evenings we have spent under the auspices of the Coventry and Warwickshire Pharmaceutical Association.

Mr. Alderman Betts, Mr. Councillor Sellers, Dr. Iliffe, and other gentlemen having spoken, a very hearty vote of thanks was passed to the lecturer who in accordance with the expressed desire of the members, consented to have his address printed for distribution.

Mr. L. Aviss then gave an experimental demonstration of the manufacture of cigars, etc. He explained that he was present at the invitation of the Secretary, who thought that some interesting practical demonstration of the method of preparing cigars and tobacco would render their first meeting more attractive. Mr. Aviss then called attention to the various tobacco leaves he had before him, and explained the various growths, the most valuable kinds appearing to be the leaves from Manilla and Havanah. He contended that there was not the slightest reason why cigars made in England from genuine leaves should not equal in quality the more expensive foreign brands. An explanation of the growth, gathering, drying, and fermenting of the tobacco was then made; and Mr. Aviss concluded with an interesting account of the penalties to which tobacco adulterators were liable, the immense revenue derived from the importation, etc. At the close of the address, cigars were made and rapidly distributed amongst the audience, who were thus practically able to test and confirm the truth of Mr. Aviss's remarks upon the quality of British-made cigars.

The President then gave an explanation of the construction, probable uses, history, etc., of the Articulating Telephone, illustrating his remarks by conversing freely with a gentleman in the Corn Exchange.

Votes of thanks to the Chairman for presiding, and to the Deputy-Treasurer (Mr. Whiting), and the Honorary Secretary for their energetic endeavours, which had conduced to make the first general meeting so great a success, brought a pleasant evening to a close.

The lecture of the Chairman was abundantly illustrated by a collection of crude drugs and preparations, contributed by Messrs. Wyleys and Company, of Coventry and London, Messrs. Hopkin and Williams and Mr. Gerrard, of London.

The next meeting will take place on the 7th inst.

LIVERPOOL CHEMISTS' ASSOCIATION.

The seventh general meeting was held at the Royal Institution, Jan. 17, 1878. The President, Mr. T. Fell Abraham, in the chair.

The minutes of the previous meeting were read and confirmed. The donations to the library were duly acknowledged. Mr. T. Farmer was unanimously elected a member.

Dr. Charles Symes said he would occupy a few minutes of the meeting to explain the construction and exhibit practically the use of the telephone. He had four complete instruments on the table and two that had been taken to pieces in order to more readily demonstrate the component parts.

The telephone he described as consisting essentially of a wood or metal case, a magnet, helix of insulated fine copper wire, and a disc of thin sheet iron. The human voice (or any other sound) causes the sheet iron disc to vibrate, and thus affects the condition of the magnet, the latter in its turn disturbs the electric condition of the helix of wire which surrounds it, and by a wire communication reacts in the opposite direction on a telephone placed at the other end, where the voice is distinctly reproduced. It was a marvellous instrument, although so simple, and whilst a large amount of credit is due to Professor Bell for the invention, neither were the labours of several of our own countrymen to be forgotten, notably those of Faraday and Wollaston, the latter having as early as 1840 reproduced most distinctly the ticking of a clock through several miles of electric wire. Dr. Symes remarked that the *Pharmaceutical Journal* of Jan. 12 contained a very correct description of the instrument, but some of the remarks concerning it were in his opinion clearly not the result of experience. The experiments referred to between Liverpool and Manchester, for example, were practically a failure, not so much from any imperfection in the instrument as from the fact that the wire used was one of a bundle of telegraph wires laid for telegraphic and not for telephonic purposes; hence the induction was so great that scarcely a distinct sound could be heard. Dr. Symes placed his telephones in practical use and conversed from a distant room with the President and members with the greatest ease and success.

Mr. A. C. Abraham called attention to an error in the Pharmacopœia occurring on page 404 of the 1867 edition. At the top of the page it is stated that—

1 pound	=	453·5925 grams.
1 ounce	=	28·3495 „

These he believed to be correct, and were presumably calculated direct from the equivalent of the gram, viz., 15·4323487 grains. Lower down, however, on the same page, 1 gallon is stated to be equal to 4·543487 litres, whereas it should be of course ten times the pound, or 4·535925 litres. The error is carried through the whole series, which should be as follows:—

1 gallon	=	4·535926 litres.
1 pint	=	·56699 „
1 fl. ounce	=	·0283495 „
1 fl. drachm	=	·0035437 „
1 minim	=	·000059 „

As this error has been overlooked in the third reprint, he thought it as well to call the members' attention to it.

Mr. Alfred E. Tanner read the following paper:—

ON ERGOT.

The peculiar external appearance of the substance known in medicine as ergot or spurred rye is well known to all engaged in pharmacy, but perhaps its internal structure and its mode of formation are not equally well-known except to those who have given special attention to the subject. It is not a little curious that a substance presenting such a singular appearance as ergot should have escaped the notice of writers of antiquity, yet such is the fact, for we find it nowhere mentioned in the writings of the ancient classical authors. Apparently the first undoubted description of it occurs in the writings of Adam Loncier of Frankfort, who towards the middle of the sixteenth century describes its appearance in the ears of rye, and mentions also its use in obstetrical cases, adding that it is regarded by women to be of remarkable and certain efficacy. Johannes Thallius, who lived in 1588, speaks of it also as used "*ad sistendum sanguinem*," thus clearly indicating its hæmostatic virtues, and although its power of arresting hæmorrhage was thus early known and appreciated, yet the action of ergot seems, until comparatively lately, to have been associated entirely with its special effect on a certain organ (the uterus) rather than upon the whole system. No mention of ergot appears in that repository of curious information, *Gerard's Herbal*, although many other rare and curious products used in medicine and pharmacy are there described. Caspar Bauhin, in the next century (1623), notices it, and terms it *Secale luxurians*, and later on in this country it is well described by our own countryman, Ray, who was a famous botanist, and who also alludes to its medicinal properties. The Dutch accoucheurs in 1747 were in the habit of employing ergot; and thirty years later it was employed with success by Desgranges of Lyons. Still the effects ascribed to it were open to grave doubts by many, and its use hardly became general and established until the commencement of the present century, when Dr. Stearns, an American, fully recognized its importance, and placed beyond doubt its therapeutic value. It is very probable that the disrepute and ill-success met with by previous experiments may be referred to the use of ergot which was either immature, or had become damaged and inert by age or other similar cause, for no substance appears to undergo change with such facility as ergot, if great care is not exercised in keeping it. It is somewhat remarkable that although so long in use, its introduction into the London Pharmacopœia did not take place until the year 1836, presenting a considerable contrast to the case of chloral hydrate and some other recently discovered substances which seem to have gained for themselves a reputation and recognition in an infinitely shorter time, although their effects cannot be said to be more definite or specific than the substance we are at present considering. Probably the powerful effects that ergot is capable of producing were first noticed to arise from the use of flour made from ergotized grain, which is well-known to be is capable of giving rise to a very formidable disease in those who are unfortunate enough to partake of it. This disease, which is known in modern medicine by the name of ergotism, was in early time distinguished by various appellations, chiefly derived from the most prominent symptoms exhibited by those who were attacked, such as morbus spasmodicus, morbus convulsivus, malignus, etc., also convulsio raphania, and ignis Sancti Antonii. There is little doubt that some of the malignant epidemics which ravaged Europe in the middle ages, and which appeared after seasons of excessive rain and scarcity, were due more or less to the use of ergotized grain; especially may be mentioned that which prevailed in France during the tenth, and in Spain during the twelfth centuries. The medical faculty of Marburg attributed to the use of cereals containing ergot the frightful pestilence which in 1596 ravaged Hesse and the adjoining regions. So far as Europe is concerned the last epidemic which appears to have taken place was in 1816, after a season of great rain, and its ravages were principally felt in Lorraine and Burgundy, the poorer class suffering most severely. The mode of formation of ergot was long a matter of speculation and great diversity of opinion. At one time it was thought to be merely the seed altered by disease, the morbid condition being ascribed by some to the agency of an insect, as in oak galls; by others the change was thought to be produced by excess of heat and moisture. Another opinion was that it was a parasitic fungus occupying the place of the seed; this opinion was that of De Candolle who named the particular fungus *Sclerotium clavus*. A third supposition, and intermediate between the other two, was that the ergot is the seed, diseased and entirely perverted in its nature by the presence of a parasitic fungus attached to it from the very beginning of its development; this is the view put forward by M. Léveillé, and published in the annals of the Linnean Society of Paris for the year 1826. The supposed fungus he calls *Sphacelia segetum*, and until within the last few years, the credit was ascribed to the late Mr. E. J. Queckett of having fully investigated this subject and established the last mentioned view of the nature of ergot. All these views were, however, to a greater or lesser extent erroneous, and it was not until 1853 that the true nature and mode of formation of ergot was finally set at rest by the laborious and painstaking researches of M. Tulasne, who has clearly demonstrated that ergot is the immature form of a particular fungus, which he calls *Claviceps purpurea*, a fungus belonging to the order Pyrenomycetes, which if kept under favourable conditions will develop into the perfect fungus of which ergot is the sclerotium (the British Pharmacopœia calls it the compact mycelium or spawn), which definition will perhaps convey a better idea of its nature; it is in reality a mushroom, and there are three successive stages, in each of which this fungus presents a peculiar form. It begins with a structure, which M. Tulasne calls the sphacelia; this appears on the outside of the ovary of the flower, and is intimately attached to it. Its development commences with that of the pistil, which really serves as a soil for it. The ovary of the rye consists of a cellular membrane of two coats, the outer of which has a thick parenchyma, white and gorged with juice, the inner is very delicate and green. The sphacelia, when it takes possession of the ovary, identifies itself with the outer parenchyma, and in some measure replaces it, being as it were borne by the inner membrane. It rapidly increases taking the form of the ovary, and almost obliterating its cavity. For some time the parasite is represented entirely by the sphacelia, which is an oblong fungous mass, almost homogeneous, soft and tender, marked on its surface by numerous furrows, and having within many irregular cavities, which, as well as the outer coat, are uniformly covered with linear parallel cells. From the summits of these cells issue oval corpuscles, which are a kind of reproductive cells called conidia; these are common to many fungi long before the perfect plant is developed. At the base of the sphacelia is produced a compact body, violet black without and white within, which is the ergot in a rudimentary stage. With this body commences the second stage in the development of the fungus. The young ergot is everywhere invested by the tissue of the sphacelia (which Tulasne calls "spermagonia" from its office); but as it increases, it seems to be placed below the spermatopherous apparatus, and raises it steadily out of the floral bracts which concealed it, ending by supporting it wholly at its summit. Sometimes the atrophied ovary and some remains of the stigmas are carried with it, and may even continue to be visible after the ergot is gathered, but more usually they become detached by drying and packing.

The time required for the full development of the sphacelia and the ergot or sclerotium has been variously estimated, and a rapidity of growth claimed for it which the truth will not warrant. Some observers state that all this takes place in about three days, but the more reliable and accurate researches of M. Tulasne, seem to indicate that about a month is necessary from the appearance of the sphacelia to the full development of the ergot or sclerotium.

Apart from any obscure resemblance to the seed of the plant supporting it, the ergot has absolutely nothing in common with the normal grain, and it is surprising that it should ever have been considered as the hypertrophied grain, to which it bears very little resemblance when closely examined. The anatomical structure and all the physical characters of ergot, are those of the mushroom; no one who has prepared the fluid extract of the Pharmacopœia could fail being struck with the mushroom-like odour which is evolved by the heat during evaporation. The germination of the ergot and the growth of a minute mushroom are the last stage in its development. Falling to the ground, in its natural course, the ergot in the soil germinates and produces mushrooms, the spores of which, carried up with the juices of the rye, become lodged in the ovary, where they begin anew the course of life and progress which I have attempted to delineate.

The ergot should not be collected until some days after it has begun to form, as, according to M. Bonjean, if gathered on the first day of its formation it does not possess the poisonous properties which it exhibits when taken on the sixth day.

The ergot fungus then, or *Claviceps purpurea*, passes through three distinct stages: (1) The mycelium and sphacelia; (2) the sclerotium, or ergot; and (3) the fruit-bearing heads, or mushrooms; the middle stage being the one with which we are particularly concerned, and which is the special state of rest of these plants. In the fully developed ergots no organs can be distinguished by the microscope. They consist of a densely felted tissue of short and somewhat thick walled cells, containing numerous drops of oil, but neither starch nor crystals.

Numerous analyses of ergot have been published, which present among themselves a curious diversity. The most elaborate is that of M. Legrip, which, however, affords little information as to its active constituents, and is, moreover, erroneous in stating starch to be one of its constituents; it is as follows:—

Fixed Oil	34·50
Starch	2·75
Albumen	1·00
Inulin	2·25
Gum	2·50
Sugar	1·25

Brown Resin	2·75
Fungin	3·50
Vegeto-Animal Matter	13·50
Osmazome	·75
A Fatty Acid	·50
Lignin	24·50
Colouring Principles	·50
Potassium Fungate	2·25
Sodium Chloride	·50
Sulphate and Magnesium, etc., Calcium	·50
Subphosphate of Calcium	1·25
Oxide of Iron	·25
Silica	·15
Water	2·50
Loss	2·35
	100·00

This is a curiosity in its way, and seems framed more for mystification than for elucidation. On few substances has so much chemical research been expended with such discordant results. No sooner has one observer announced the discovery of its active principle or principles than another publishes observations which entirely negative the conclusions of the first. Dr. Wright supposed the virtues of ergot to reside in the fixed oil, which constitutes about 30 per cent. of this drug. Wiggers subsequently announced the discovery of what he called ergotin, which has been since proved to be merely resinous matter, and which, as in the case of the oil, has been proved to have little or no effect. Bonjean, a pharmacien of Chambère, in 1843, was the first to prepare a really active form of ergot; this he calls ergotine, or hemostatic extract. A few years since, W. T. Wenzell, of Wisconsin, announced the discovery of two alkaloids in ergot, which he named respectively ecboline and ergotine; to the former he ascribes very powerful effects, and states that it possesses in a high degree the special medicinal properties of the ergot; in the latter, viz., the ergotine, little effect was found. The whole subject of the chemical constituents of ergot has been recently very carefully gone over, with the view of determining with some degree of certainty to what bodies it owes its peculiar action. This has been undertaken by Professor Dragendorff, of Dorpat, and Herr Podwissotzky, with the result that ergot owes the greater part of its activity to a principle called sclerotic or sclerotinic acid, which is present to the extent of about 4 per cent., and which is obtained by a tedious process from the ergot exhausted with water and precipitated by absolute alcohol. I have a small sample of this substance here, and I had hoped to have brought with me a much larger specimen, but found I could not complete it in time. It has been extensively used hypodermically in Germany by Professor Von Holst, and seems possessed of a very high degree of activity, four to five centigrams being the usual dose. It certainly has the merit that whereas the substances formerly announced as being active principles were prepared by means of powerful chemical agents, and therefore presumably more or less altered or actually formed during the process, this one, viz., the sclerotic acid, has been separated entirely by means of alcohol, and therefore not exposed to powerful chemical action, a most undesirable proceeding with a substance so prone to change as ergot. The whole paper is a most interesting one, and will well merit careful study—and it will be found in the *Pharmaceutical Journal* for June 17, 1876. There is no doubt, should further trial prove the efficacy of sclerotic acid, that it will be found far superior as an agent for hypodermic use than the so-called ergotins at present used, all of which, however carefully purified, cause much pain and inconvenience in use, and are besides very prone to decomposition. The administration of medicines hypodermically is now much in vogue; they are found to act with much greater rapidity, with less constitutional disturbance, and in smaller doses than when administered by the stomach. The cases in which ergot is now employed are much more numerous than formerly. Its action is chiefly confined to unstriped or involuntary muscular fibre, such as the middle coat of the arteries, the uterus, etc., causing powerful contraction and thus arresting hæmorrhage, which it does most promptly; it has also been used for months together in the treatment of fibroid tumours of the uterus, aneurisms, etc. Its use seems indicated in some of the most terrible maladies which affect mankind; its investigation, therefore, is all the more important.

A discussion on the paper took place, to which the author replied; and with a cordial vote of thanks to the members for their miscellaneous communications, and to Mr. Tanner for his able paper, the meeting terminated.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION SOIREE.

The annual *soirée* of the Midland Counties Chemists' Association took place on Wednesday evening, January 23, at the Town Hall, Birmingham, and was a most enjoyable and successful reunion.

The *soirée* was well attended, visitors being present from London, Manchester, Liverpool, and most of the towns in the surrounding district.

The proceedings began with an organ recital by Mr. Stimpson, who played a choice selection of music, and the interval between the organ performance and the commencement of dancing was filled up by an inspection of the exhibition.

In the basement of the hall Messrs. F. S. Cleaver and Sons, of Red Lion Street, Holborn, illustrated the manufacture of fancy toilet soaps by a new and interesting method. The ordinary mode of manufacturing toilet soap is by boiling, the scent being put in whilst the material is in a liquid state; the consequence is that a considerable amount of the scent evaporates. By the process adopted by Messrs. Cleaver, the soap is first cut into shavings and dried artificially until all the superfluous moisture is extracted. The shavings are then passed through rollers, and are ultimately discharged in long strips something like ribbon. This is done three times, and whilst the operation is going on the scent and colour are added, so that none of the former is lost by evaporation, being well mixed with the soap, and there is afterwards no shrinking and consequent loss of weight and appearance. The next process is to place the shavings in a machine in which there is a large cone-shaped screw cylinder. The soap is worked along from the large to the small end of the cylinder by the revolutions, and thereby compressed; it is then forced through a grating into what is termed a mouthpiece, around which there is hot water, the water being kept at a temperature of about 100° by a lamp underneath. The soap passes out of the mouthpiece in bars, and another apparatus cuts them into tablets, which are then stamped and wrapped up. The process attracted much attention from the visitors, and it was rendered additionally interesting by ladies themselves stamping the tablets, which bore an inscription stating that they had been presented by F. S. Cleaver and Sons. Messrs. Cleaver also exhibited their mode of filling and closing collapsible tubes for perfume. The tubes are filled from the bottom, and they are then placed in sockets with the tops downward, the machine holding about two dozen. A cam action takes along the frame, in which the tubes are placed by steps, and each tube passes through a series of "jaws" and tunnels—the former pinching the metal together, and the latter lapping over a small portion of the end, so that it comes out beautifully fitted up. The machine closes about two dozen tubes a minute. The machinery was worked by the "Otto" silent gas engine, which had been lent for the occasion by Messrs. Wright and Co., of Broad Street.

The manufacture of porcelain was exhibited and carried on in the east corridor by the Worcester Royal Porcelain Company, under the direction of Mr. Binns. Bolton's potter's wheel was especially obtained by the company and fitted up for the purpose of illustrating the process of "throwing." The motive power of the wheel is given by two cones, which are regulated by a lever, so that a fast or slow motion can be obtained at the will of the operator. On receiving a ball of clay, the thrower places it upon the head of a wheel or horizontal lathe before him and presses it with both hands; the rotary movement causes the clay to rise in the form of a stalk or cone, which he then depresses and again allows to rise. When the clay is thus made ready he inserts his thumb into the mass, moulding and fashioning the outsides with the other hand. In this ways cups, bowls, and all circular articles are formed, the correctness of outline depending entirely on the manipulation of the thrower. Another process exhibited was figure-making and casting. For this purpose moulds are used, and the china employed is a liquid "slip," like cream. This is poured into the orifice of the mould left for that purpose, and then allowed to stand for a short time. When sufficient slip has adhered to the mould the remainder is poured back into the casting jug. The moulds being porous the water is absorbed, leaving the inside of the article hollow, and the slip soon becomes solid enough to enable the workman to handle it. He next arranges all the pieces, trims off the superfluous clay, makes a perfect joint, and each part is fitted to its proper place until the whole figure is built up as required. For some huge figures as many as ninety-seven different moulds are required, and even the very smallest are represented by eight or ten separate parts. The subsequent processes of baking and glazing were explained; but it was, of course, not possible to illustrate them practically. Another very interesting operation, however, was exhibited, namely the decoration of porcelain. The mode of painting the beautiful colours and objects for which the Worcester china is so noted, was intelligently described by an artist, whose manipulation of the finely-executed patterns and explanation of the various stages through which the work advances and the gilding process attracted the utmost attention, and afforded no little interest. The crude materials of which the porcelain is composed were also exhibited, and beautiful samples of finished work, in Japanese and other patterns, as well as examples of hand-painting, were shown by the company.

In the great gallery there was a microscopical exhibition, under the superintendence of Mr. W. Wright Wilson, F.L.S., assisted by members of the Natural History Society and others. About thirty microscopes were exhibited by Mr. Bolton, of Stourbridge. The crystals of various drugs were shown, illustrating the different forms of crystallography, and electrical and other apparatus were lent by Messrs. P. Harris and Co., also, a collection of new fluorescent solutions; and a set of Bohemian glass, illustrating the various forms of crystals. Here, too, Messrs. Southall Brothers and Barclay displayed a number of specimens illustrating the production of alkaloids. Quinine was shown in snow-white masses of delicate needle-like crystals, and the impure article in various stages of purification, together with the other products of the bark. Morphine came next, with samples of exhausted opium liquor containing the morphia, and various precipitates more or less pure. Strychnine, from nux vomica, was illustrated by a similar series of preparations; as well as emetine, atropine and aconitine, displayed with similar illustrations. The process of distilling artificial fruit essences was shown by means of a model furnace and sand-bath. A collection of the articles employed showed that, by manipulating *secundum artem* certain proportions of decayed cheese, chalk, and fusel oil, a product could be obtained having the delicate odour and flavour of the choicest pine-apple. From similar apparently unlikely materials were also produced liquids smelling strongly of apples, pears, the flowers of meadow sweet, wintergreen oil, bitter almonds, etc. The same firm also exhibited a fine and most interesting collection of specimens illustrating the chemical composition of many articles of food and drink, showing by analysis the several constituents and relative value of each kind of food. Close by these specimens Mr. H. W. Jones, F.R.M.S., exhibited an ingenious apparatus for analysing tobacco smoke.

In the west corridor Messrs. Southall Brothers and Barclay also exhibited specimens of the various plasters. By means of a large copper pan, heated for the occasion by gas, the production of lead plaster, the basis of the plasters exhibited, was shown.

Among the other exhibits was an arrangement for pin-papering in operation, sent by Mr. Councillor Cook; Messrs. W. F. Hunt and Co., of Oxford Street, London, exhibited in operation a machine for making plaited paper bottle caps stronger than ordinary capping paper, which neither crack nor shrivel and require no wetting, trimming, or skill in fixing. Scientific apparatus and experiments of considerable interest were shown by Mr. C. J. Woodward. Mr. Russell, of the Midland Institute, also contributed some novel and interesting experiments in physics. Rare drugs and pharmaceutical preparations were lent by Messrs. Hopkin and Williams, and Mr. Gerrard, of London, and new remedies and their preparations by Messrs. Wyleys and Co., of Coventry. An apparatus kindly lent by the Midland Institute, showing beautiful figures produced by coloured solutions diffused through two alcoholic liquids of different densities was exhibited by Mr. Marlow and Mr. Josiah Austin. The manufacture of confectionery, lozenges and crèmes was illustrated by Messrs. Gammon, Marrian, and Co. of Birmingham. The telephone was practically demonstrated with a short lecture by Mr. W. J. Lancaster. Mr. Ballard, of Ledbury, showed a new and improved pendulum apparatus with a rotating pen. Mr. Josiah Pumphrey exhibited autographic printing, type writing, etc. Messrs. Silverlock of London, sent some excellent specimens of medical and chemical labels for dispensing, etc. Messrs. Philip Harris and Co., E. Morand and Wright Wilson provided a joint display of the various effects produced by the electric fluid, amongst which may be enumerated the gorgeous effects of the electric spark passed through a vacuum tube containing a fluorescent fluid; a three-inch spark from a powerful coil, made by Mons. Morand; the heating effects of the current on platinum wire and a leyden jar, which gave a fairly good imitation of lightning. In one of the corridors Mr. Wright Wilson gave an interesting exhibition of the effects of various coloured lights upon flowers, coloured dresses, etc. Contrasting this with the effects of the colours produced by the lime-light after being passed through a prism, the effects were marvellous. A red camellia or pink scarf was black or pale green by sodium light, but the natural colours were re-established by the lime-light. Mr. E. Robotham, of the Great Western Arcade, exhibited a collection of his specialities, viz., show cases, glass stands, and shop fixtures; also the various productions of Messrs. Francis M. Farina of Cologne, consisting of their gold medal Cologne, prize soaps, perfumes, etc. The Terra Cotta Company of Torquay showed some of their handicraft, one specimen of which is well worthy of notice, viz., "Sunshine," an original study by one of the company's own artists. Some magnificent specimens of wood carving were also shown by the same firm. Great credit is due to Mr. F. W. Kimberley, for his great labour in carrying out the arrangements for the *soirée.*

A full military band was in attendance, and dancing was engaged in until an early hour.

ABERDEEN SOCIETY OF CHEMISTS AND DRUGGISTS.

The second of the course of lectures in connection with the above Society was delivered in the rooms, St. Nicholas Lane, on the evening of Thurdsay the 18th

Jan., by Mr. George Miller, of John Miller and Sons, Sandilands Chemical Works.

Mr. D. Reid, of George Reid and Sons, occupied the chair, and in introducing the lecturer complimented the Society as to having taken a step in the right direction. These meetings brought to his mind many pleasant recollections of forty years ago; and though many of the then members were off the stage, still there were younger ones growing up to tread in their footsteps. He then urged on the younger portion of his audience the necessity of using the present opportunities for study, so as to enable them to combat successfully with the examinations of the Pharmaceutical Society, as well as to lay a sure foundation whereon to build a store fit for future use.

Mr. Miller then delivered a very able and interesting lecture on "Artificial Light." The lecturer described very minutely the lights of past ages, giving as illustrations the primitive oil lamps with rush wicks, tallow dips, and composite candles. He then passed on to more recent times, the lights of which were illustrated by naphtha, paraffin, and benzine, as well as paraffin and ozokerite candles. Some duplicate lamps were burning (which were filled with oil of a different quality from the above) merely for the sake of showing the different illuminating powers. He then gave in detail the various sources of earth oil, describing the countries, the methods of boring and procuring the oil from the wells.

As time would not permit, the second part of the lecture, which relates principally to the coal tar products, was left over for another evening.

The lecture was listened to with marked attention, and at the close a hearty vote of thanks was given to the lecturer and chairman, after which the greater part of those present took the opportunity of inspecting the various samples of oil, etc., in their various stages of refinement.

The next lecture is expected to be delivered on Thursday, 14th February, by Mr. George Edward.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.—ASSISTANTS' SECTION.

The third meeting of the present session was held in the Andersonian College, on Wednesday the 16th ult. Mr. William Simpson, President, in the chair.

The minutes of the last meeting having been read and confirmed, Mr. Simpson read a paper on Iodine, in which he gave a sketch of its discovery by Courtois, in 1812, and described the preparation of kelp, and the processes employed by manufacturers, more especially those of Glasgow, in isolating the iodine from it. He also mentioned the close analogy of iodine to chlorine and bromine, and mentioned the reagents by which its presence, either in a free state or in combination, might be confirmed. After a few remarks by some of the members, a cordial vote of thanks was awarded to the reader of the paper.

The festival committee gave in their report, after which a few new members were elected and the meeting brought to a close.

Parliamentary and Law Proceedings.

A Bill to Amend the Medical Act, 1858.

The following is a copy of the Bill introduced by Dr. Lush:—

"Whereas an Act was passed in the twenty-first and twenty-second years of the reign of Her Majesty 'to regulate the qualifications of practitioners in medicine and surgery;' and whereas it is expedient to amend the said Act:

"Be it therefore enacted by the Queen's most excellent Majesty, by and with the advice and consent of the lords spiritual and temporal, and commons, in this present parliament assembled, and by the authority of the same, as follows:—

"1. Section forty of the said recited Act is hereby repealed; and in lieu thereof it is enacted: Any person who for the purpose of gain shall take or use the name or title of physician, doctor of medicine, licentiate in medicine, licentiate in surgery, bachelor of medicine, surgeon, general practitioner, apothecary, or any other medical or surgical name, title, or description purporting to authorize the practice of medicine or surgery, unless such person holds a qualification or qualifications entitling him to take or use such name, title or description, and such qualification or qualifications be also registered under the said recited Act, shall, upon summary conviction for either or any such offence pay a sum of twenty pounds.

"Any person who for the purpose of procuring the registration of the cause of death of any deceased person shall make, fill up, or sign any medical certificate of the cause of such death, unless he personally attended such deceased person during his or her last illness, and holds a qualification in medicine or surgery duly registered under the said recited Act, shall upon summary conviction for either or any such offence pay a sum of twenty pounds.

"If any person shows that he is not a British subject and not ordinarily resident in the United Kingdom, and holds a medical diploma, degree, or title from some university, college, or body in any British possession or foreign country entitled to grant the same, such person shall not be liable to any penalty under this section.

"2. To section forty-two of the said recited Act the following words shall be added, viz., anything to the contrary in any Act passed before the passing of this Act notwithstanding.

"3. To schedule A of the said recited Act this section shall be added: When the General Medical Council are satisfied that any medical diploma, degree, or title granted by any university, college, or body in any British possession or in any foreign country is granted in respect of a degree of knowledge in both medicine and surgery equal to that required for obtaining a licence in both medicine and surgery under the said recited Act, they may from time to time, if they think fit so to do, place such diploma, degree, or title upon the medical register, and if at any time any such medical diploma, degree, or title ceases to be granted in respect of such degree of knowledge as aforesaid they may remove the same from such register.

"4. This Act to be read with and form part of the said recited Act.

"5. This Act may be recited for all purposes as the Medical Acts Amendment Act, 1878."

The Practice of Using Old Mineral Water Bottles.

A question of considerable interest to mineral water makers came on this week in Chancery Division of the High Court of Justice, before Sir R. Malins, in the suit of Bratby *v.* Mather. This was a motion to restrain the defendant from selling mineral waters in bottles bearing the name of the plaintiff. Both parties carried on business in Manchester as vendors of aerated and mineral waters. The plaintiff stated that the defendant was in the habit of filling up with his own mineral waters and affixing his own labels to empty bottles bearing the name of the plaintiff stamped on the bottles in raised glass letters. The defendant did not deny the facts, but stated by way of defence that he only filled up bottles that had been returned amongst his own empties by his own customers, and that this was a usual custom. A statement in the defendant's affidavit that such custom was "a bad practice, though difficult to avoid," caused some amusement in the court.—Mr. Pearson, Q.C., and Mr. A. J. Pound appeared for the plaintiff; Mr. Higgins, Q.C., and Mr. Henderson for the defence.—The motion was ordered to stand over until the hearing of the cause.—*Standard.*

Poisoning by Carbolic Acid.

At the Liverpool Coroner's Court, on Saturday, Jan. 26, Mr. Clarke Aspinall held an inquest upon the body of Elizabeth Lavell, forty-two years of age, wife of Wm. Lavell, stevedore, of 22, Duke Street. The deceased who was said to be addicted to drunkenness, and to have been in liquor at the time, drank some carbolic acid from a cup on Thursday evening, saying, "Now I have done it," and died from the effects of the poison next morning. A verdict to the effect that the deceased had committed suicide while labouring under temporary insanity was returned.

The Regulation of Pharmacy in Victoria.

The following are the Acts passed by the legislature of Victoria referred to in the last number of this Journal:—

AN ACT TO ESTABLISH A BOARD OF PHARMACY IN VICTORIA.

[22*nd December*, 1876.

Be it enacted by the Queen's Most Excellent Majesty by and with the advice and consent of the Legislative Council and the Legislative Assembly of Victoria in this present Parliament assembled and by the authority of the same as follows:—

1. This Act shall come into operation on the first day of January One thousand eight hundred and seventy-seven, and shall be called and may be cited as the "*Pharmacy Act* 1876."

It is divided into parts as follows:—

Part I.—The Pharmacy Board of Victoria, ss. 3–10.

Part II.—The Pharmaceutical Register of Victoria, ss. 11–17.

Part III.—Registered Pharmaceutical Chemists, ss. 18–21.

Part IV.—Miscellaneous, ss. 22–26.

2. Chemists and Druggists within the meaning of this Act shall consist of all persons who at any time before the passing of this Act have carried on in Victoria the business of a chemist and druggist in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners and also of all such persons as may be duly registered under this Act.

Part I.—Pharmacy Board of Victoria.

3. Subject to the provisions of this Part of this Act the Governor in Council may appoint a Board consisting of a president and six other members, under the style of "The Pharmacy Board of Victoria," hereinafter in this Act termed "The Board."

4. No person shall be elected or appointed president or member for more than three years, but shall be eligible for re-election or re-appointment, and the Governor in Council may from time to time remove the president or any other member of the Board.

5. The first president and other six members of the Board shall be appointed by the Governor in Council without previous election, provided that no person shall be so appointed who does not appear to be eligible for registration as a registered pharmaceutical chemist; such president and members shall be appointed for a period of three years; if any vacancy occur in the Board during such period the Governor in Council may appoint thereto without previous election any registered pharmaceutical chemist, and the person so appointed shall hold office until the expiration of three years from the date of the appointment of the first members of the Board under this Act and no longer.

6. At the expiration of the period for which the first president and members of the Board shall be appointed to hold office no person shall be a member of the Board unless he be a registered pharmaceutical chemist, and unless he shall have been elected to act as a member of the Board by the registered pharmaceutical chemists of Victoria; and no person shall be appointed as president unless he be a member of the Board and shall have been elected by the other members to act as president. Every election shall be held in manner prescribed by regulations to be made by the Board subject to the approval of the Governor in Council.

7. A quorum of the Board shall consist of not less than three members thereof, and in the absence of the president from any meeting of the Board one of the members present shall be elected chairman of that meeting.

8. The Board may from time to time appoint a registrar and any other officers, whom they may require for the purposes of this Act, and shall have power to remove the same at any time.

9. The Board may from time to time make alter or rescind regulations for the purpose of carrying this Act into effect. Such regulations shall not have any effect if they be repugnant to any law in force in Victoria or to the provisions of this Act nor until they shall have been confirmed by the Governor in Council and published in the *Government Gazette.*

10. The Board may question any person who may attend before the Board and any witness who may be produced before the Board and may examine any persons upon oath or take a solemn declaration from such persons, and if any person shall wilfully knowingly or corruptly make any false statement upon such examination or in such declaration or shall utter or attempt to utter or put off as true before the Board any false forged or counterfeit diploma degree license certificate or other document or writing he shall be guilty of a misdemeanor and being thereof duly convicted he shall be liable to be imprisoned for any period not exceeding one year.

Part II.—The Pharmaceutical Register of Victoria.

11. The Board shall from time to time cause the names of all persons certified by the Board as duly qualified for registration as registered pharmaceutical chemists to be registered with their residences and qualifications in a book to be kept by the Board for that purpose in the form in the First Schedule to this Act or to the like effect; and such register shall be called "The Pharmaceutical Register of Victoria." All persons so long as their names continue to be enrolled in such register may be described in this or any other Act or any regulations as "registered pharmaceutical chemists."

12. Previously to registration or examination under this Act such fees shall be payable as are set out in the Second Schedule to this Act or such other fees as may from time to time be fixed and determined by any regulation hereafter made by the Board in accordance with this Act, and the said fees shall be paid to the registrar of the Board for the purposes of this Act.

13. The Board may from time to time make the necessary alterations in the registration of the qualifications and addresses of the persons registered under this Act, and may from time to time write or cause to be written a letter to any registered pharmaceutical chemist addressed to him according to his last known address to enquire whether he has changed his residence, and if no answer be returned to such letter within the period of six months from the sending thereof the Board may erase the name of such person from the Pharmaceutical Register and may restore the same to such register upon the personal application of such person and production of his certificate or satisfactory proof of his former registration.

14. Every registered pharmaceutical chemist on changing his residence shall intimate the same to the Board and every deputy registrar in Victoria on receiving information of the death of any registered pharmaceutical chemist shall forthwith transmit notice thereof by post to the president of the Pharmacy Board in Melbourne, and on receipt of such notice the Board shall erase the name of such chemist from the Pharmaceutical Register of Victoria.

15. If any registered pharmaceutical chemist be convicted of any offence under this Act which in the opinion

of the Board renders him unfit to be on the Pharmaceutical Register of Victoria the Board may subject to the approval of the Governor in Council order the name of such person to be erased from such register, and such erasure shall be a disqualification as a registered pharmaceutical chemist within the meaning of this Act, and it shall be the duty of the Board to erase such name accordingly.

16. The Board shall in the month of January in each year cause to be printed published and sold a correct register of the names of all registered pharmaceutical chemists, and in such registers respectively the names shall be in alphabetical order according to the surnames with the respective residences of such chemists, and such printed register shall be called "The Pharmaceutical Register of Victoria for 1877" and for every succeeding year.

17. A printed copy of such register for the time being purporting to be so printed and published as aforesaid, or a copy of the *Government Gazette* purporting to contain any regulation made by the Board shall be *primâ facie* evidence in all courts of justice and in all legal proceedings whatsoever that the persons specified in such printed register are registered according to the provisions of this Act, or that such regulation is duly made; and the absence of the name of any person from such printed register for the time being shall be evidence until the contrary shall be made to appear that such person is not a registered pharmaceutical chemist.

Part III.—Registered Pharmaceutical Chemists.

18. No person shall receive from the Board a certificate that he is duly qualified for registration as a registered pharmaceutical chemist unless he shall have attained the age of twenty-one years, and unless—

(I). At any time before the date of the commencement of this Act he shall for not less than two months have carried on the business of a chemist and druggist or homœopathic chemist in the keeping of an open shop for the compounding and dispensing of the prescriptions of legally qualified medical practitioners, or unless

(II). At any time before the date of the commencement of this Act he shall for not less than three months have been employed as a dispensing assistant in an open shop for the compounding and dispensing of the prescriptions of legally qualified medical practitioners, or until he shall have been for not less than three years employed as a dispensing chemist in an hospital benevolent asylum or other public institution or unless

(III). He hold a certificate or diploma of competency as a pharmaceutical chemist or as a chemist and druggist or homœopathic chemist from the Pharmaceutical Society of Great Britain or any college or board of pharmacy recognized by the Board under any regulations made under this Act, or unless

(IV). He shall have served for not less than four years as an apprentice in the business of a registered pharmaceutical chemist or chemist and druggist or homœopathic chemist keeping open shop for the compounding and dispensing of the prescriptions of legally qualified medical practitioners, and shall also have attended one course of lectures and passed examinations in each of the following subjects at the University of Melbourne, or some school or college of pharmacy recognized by the board:—Materia medica, and medical botany, and practical chemistry; and shall have passed examinations before the board as hereinafter provided in the subject of practical pharmacy and any subject that may be prescribed by the Board with the approval of the Governor in Council. Provided always that any person having served or serving in Victoria a period of not less than three years' apprenticeship whose period of apprenticeship shall have commenced three months at least before the date of the commencement of this Act either with a chemist and druggist or with a recognized licentiate apothecary or in a public hospital shall be required to pass such modified examination only as the Board may prescribe.

A certificate of qualification in the form in the Third Schedule hereto shall entitle the person named therein on payment of the proper fee to be registered under this Act at any time within six months after the date of such certificate.

19. The Board shall permit any officer or person appointed by the Governor in Council to be present during the progress of any examination conducted by the Board.

No person shall be examined by the Board as directed by the next following section until he furnish a statutory declaration by a master chemist in the form in the Seventh Schedule hereto or to the like effect of his having served the apprenticeship and where necessary certificates of his having attended one course of lectures and passed the examinations directed in the last sub-division of section eighteen.

20. The Board shall have power to control and direct all examinations in practical pharmacy and such other subjects as may from time to time be approved by the Governor in Council and published in the regulations of the Board. Such examinations shall not include the theory and practice of medicine surgery or midwifery. The Board may grant or refuse to such persons certificates of competency skill knowledge and qualification to exercise the business or calling of a pharmaceutical chemist. In the case of rejection a rejected candidate may present himself for re-examination after a period of six months.

21. Every person who desires a certificate of qualification for registration under this Act or to be examined by the Board shall furnish the Board with a statutory declaration according to the Fourth or Fifth Schedule or to the like effect.

Where a person applies for such certificate under subdivision one of section eighteen his declaration must be accompanied by the statutory declaration of a justice or legally qualified medical practitioner in the form in the Sixth Schedule or to the like effect that such justice or practitioner from his own knowledge believes the statement of the applicant to be correct and true.

Where a person applies for such certificate under subdivision two of section eighteen his declaration must be accompanied by a statutory declaration in the form in the Seventh Schedule or to the like effect of the person in whose shop he was employed that the statement of the applicant is correct and true.

Where a person applies for such certificate under subdivision three of section eighteen his declaration must be accompanied by the certificates or diplomas on which he bases his application. Such certificates or diplomas shall be returned to the applicant by the Board.

Part IV.—Miscellaneous.

22. The provisions of Part II. of the "*Public Health Statute* 1865," shall extend to all articles usually taken and sold as medicines, and every adulteration of any such article shall be deemed an admixture deleterious to health, and any person whether registered under this Act or not who sells any such article adulterated shall unless the contrary be proved be deemed to have knowledge of such adulteration.

23. Nothing herein contained shall extend to or interfere with the business or with any rights and privileges of any legally qualified medical practitioner or of any member of the Royal College of Veterinary Surgeons of Great Britain nor with the business of wholesale dealers in supplying drugs and chemicals in the ordinary course of wholesale dealing; and upon the decease of any registered pharmaceutical chemist actually in business at the time of his death it shall be lawful for any executor

administrator or trustee of the estate of such pharmaceutical chemist to continue such business for a period of twelve months and no longer unless by permission of the Board of Pharmacy of Victoria if and so long only as such business is *bonâ fide* conducted by a registered pharmaceutical chemist.

24. Any deputy registrar or other person who shall wilfully make or cause to be made any falsification in any matter relating to the Pharmaceutical Register of Victoria or the Pharmaceutical Register of Victoria for any year, and any person who shall wilfully procure or attempt to procure himself to be registered under this Act by making or producing or causing to be made or produced any false or fraudulent representation or declaration either verbally or in writing and any one aiding or assisting therein shall be deemed guilty of a misdemeanor punishable by fine or imprisonment, and shall on conviction be liable to a penalty not exceeding Twenty pounds or to imprisonment for any term not exceeding twelve months.

25. From and after six months after the date of the first appointment of the Board any person who commits in Victoria any of the following offences shall on conviction thereof be liable to a penalty of not exceeding Ten pounds for each offence, and may also be committed to prison for any period not exceeding six months.

(I). Any person not being a registered pharmaceutical chemist who carries on or attempts to carry on business as a chemist and druggist or homœopathic chemist or either.

(II). Any person not being a registered pharmaceutical chemist who takes uses or exhibits the name or title of or who pretends to be a registered pharmaceutical chemist, chemist and druggist, chemist, druggist, pharmacist, pharmaceutist, pharmaceutical chemist, homœopathic chemist, dispensing chemist, or dispensing druggist.

(IV). Every registered pharmaceutical chemist or person in the employ of such chemist who prescribes or practices medicine or surgery except in accordance with any rights and privileges hitherto enjoyed by chemists and druggists in their open shops.

(V). Any person who fails to comply with the provisions of this Act or any regulations made hereunder.

Nothing in this Act shall prevent any person from being liable to any other penalty damages or punishment to which he would have been liable if this Act had not been passed.

26. All offences under this Act shall be heard and determined and all penalties imposed by this Act shall be recovered in a summary manner before two justices of the peace in petty sessions, and all penalties when recovered shall be paid to the Board to be applied towards the expenses of carrying this Act into effect.

Second Schedule.

Fees Payable under Pharmacy Act 1876.

	£	s.	d.
For every examination before the Board under section 18	3	3	0
On registration as a pharmaceutical chemist without examination (sect. 18, subdivisions 1, 2, and 3)	2	2	0
On registration in every other case	1	1	0

AN ACT FOR REGULATING THE SALE AND USE OF POISONS.

[*22nd December*, 1876.

Whereas the unrestricted sale of poisons often leads to fatal accidents and the commission of crime: And whereas large quantities of arsenic, strychnine, and other poisons, are used in the colony for pastoral, agricultural, and other purposes and fatal accidents occur by reason of the careless custody and use of such poisons by the owners thereof or persons in their employ: And whereas it is expedient for the safety of the public to regulate the sale of poisons and to make provisions for the exercise of proper precautions in the use of the same: Be it therefore enacted by the Queen's Most Excellent Majesty by and with the advice and consent of the Legislative Council and Legislative Assembly of Victoria in this present Parliament assembled and by the authority of the same as follows (that is to say):—

1. This Act may be cited as the "*Sale and use of Poisons Act* 1876."

2. The several articles mentioned in the First Schedule hereto shall be deemed poisons within the meaning of this Act; and on the recommendation of the Pharmacy Board of Victoria the Governor in Council may by proclamation duly published in the *Government Gazette* from time to time declare that any other article specified in such proclamation shall be deemed a poison within the meaning of this Act.

3. Every person other than a legally qualified medical practitioner or a registered pharmaceutical chemist who shall sell any poison shall unless he hold a certificate from the Pharmacy Board of Victoria that he is a fit and proper person to sell poisons be liable to a penalty not exceeding Twenty pounds.

4. In places distant at least four miles from any city town or borough and in which no registered pharmaceutical chemist has an open shop any person who shall produce a certificate from a legally qualified medical practitioner and a police magistrate that he is a fit and proper person to be allowed to sell poisons in such place shall receive from the Pharmacy Board of Victoria a certificate as a dealer in poisons on payment of a fee of Twenty shillings per annum to such Board.

Every dealer in poisons shall keep all poisons in a cupboard of such dimensions and containing such shelves as the Pharmacy Board of Victoria may direct. The word "poisons" shall be conspicuously painted or written on such cupboard, and no articles other than such poisons shall be placed or kept therein.

5. Every person who shall sell any poison specified in the first part of the First Schedule hereto shall before the delivery thereof to the purchaser inquire his name, place of abode and occupation, and the purpose for which such poison is required or stated to be required, and shall thereupon make a faithful entry of such sale, specifying the poison and the quantity thereof and all such particulars so given by the purchaser, together with the day of the month and year of such sale, in a book to be kept by the vendor for that purpose in the form set forth in the Second Schedule hereto; and every such entry shall be signed by the person making the same and also by the purchaser unless he shall declare himself unable to write (in which case the person making the entry shall add thereto the words "purchaser cannot write"); and whenever a witness to the sale is required by this Act such entry shall be signed by such witness together with his place of abode. When sales and purchases of poisons are made by correspondence the letter ordering the same shall be preserved by the vendor and a memorandum of the date of the said letter by whom it was written and the quantity and particulars of the poison therein ordered shall be entered in the said book; and no person shall sell poison so ordered to any person with whose signature he is not acquainted unless such signature shall have been witnessed or purport to have been witnessed by a justice clergymen or public officer or be authenticated by some person known to the vendor.

6. No person shall sell any poison either by wholesale or retail unless the bottle or other vessel, wrapper or cover, box or case immediately containing the same bears thereon the word "poison" printed conspicuously together with the name of the article and the name and address of the seller thereof.

7. No person shall sell any arsenic or strychnine or any preparation of the same respectively, unless in the case of arsenic and any uncoloured preparation of the

same such poison shall be mixed before the sale or delivery thereof with soot in the proportion of one ounce of soot at least to one pound of arsenic, and so in proportion for any greater or less quantity; and unless in the case of strychnine or any uncoloured preparation of the same such poison shall be coloured with Armenian bole or other red colouring matter before the sale or delivery thereof: Provided always that whenever the purchaser states that such arsenic or strychnine or any preparation thereof respectively is required not for any pastoral or agricultural use but for some other purpose for which such admixture would according to the representation of the purchaser render it unfit such poison may be sold without the admixture hereinbefore specified.

8. No person shall sell any poison specified in the first part of the First Schedule hereto to any person who is under eighteen years of age or who is unknown to the vendor unless the sale be made in the presence of some witness who is known to the vendor and to whom the purchaser is known, and which witness signs his name together with his place of abode to the required entry before the delivery of the poison to the purchaser.

9. Any owner or other person whatsoever in charge or possession of any poison who shall leave it in any place (whether the same be ordinarily accessible to others or not) unless the bottle or package of whatever kind in which such poison may be contained shall be marked as "poison" and be otherwise duly labelled in the manner provided by section six shall be liable on summary conviction thereof before any two justices to a penalty not exceeding Twenty pounds.

10. If any person shall sell any poison contrary to the provisions of this Act, or if on any sale thereof he shall deliver the same without having made and signed the entry required by this Act on such sale, or without having obtained such signature to such entry as required by this Act, or if any person purchasing such poison shall give false information in answer to inquiries to the person selling the same in relation to the particulars which he is by this Act authorized to inquire into of such purchaser, or if any person shall sign his name as a witness to the sale of any such poison to a person unknown to such witness, or if any person fail to comply with any of the provisions of this Act for offending against which no specific penalty is provided, every such person so offending shall for every such offence upon summary conviction thereof before two justices be liable to a penalty not exceeding Ten pounds.

For the purpose of this section the person on whose behalf any sale is made by an assistant or apprentice shall be deemed to be the person who shall sell, and such assistant or apprentice shall be liable to the like penalties as the person on whose behalf he makes any sale.

11. The Governor in Council may on the recommendation of the Pharmacy Board of Victoria by order direct the cancellation of the certificate as a dealer in poisons held by any person who is convicted of any offence against this Act which renders him unfit or who shall be deemed unfit through habitual intoxication or otherwise to continue to sell poisons.

12. The Governor in Council may on the recommendation of the Pharmacy Board of Victoria from time to time make any regulations as to the colouring of any poisons or as to the sale or custody of the same or otherwise as to carrying into effect the objects of this Act. Such regulations after publication in the *Government Gazette* shall have the same force and validity as if the same formed part of this Act, and a copy of the same shall be laid before both Houses of Parliament without unnecessary delay.

13. This Act shall not extend to the sale of any poison when made up or compounded as a medicine according to the prescription of a legally qualified medical practitioner or in the form of homœopathic medicine unless in the crude state mother tincture of a greater strength than the third decimal potency; nor to the sale of patent or proprietary medicines; nor to the sale of photographic materials for the purpose of photography; nor to the sale of medicines dispensed by veterinary surgeons for animals under their treatment; nor to the sale of fly poison papers or packets of poisonous mixtures save and except poisoned seed for the destruction of vermin when duly marked as such; nor shall it extend to any sales by wholesale dealers in the ordinary course of wholesale dealing if an order in writing signed by the purchaser shall be given for the supply of the same: Provided that all such sales shall be entered in a book and that the bottle or other vessel wrapper or cover box or case immediately containing the poison be labelled as required by this Act.

SCHEDULES.

First Schedule.

LIST OF POISONS.

1st Part.

Arsenic and its preparations.
Prussic Acid and its preparations.
Strychnine and its preparations.
Savin and its Oil.
Ergot of Rye and its preparations.
Chloral Hydrate.
All poisonous Vegetable Alkaloids and their Salts.
Aconite and its preparations.
Tartar Emetic.
Corrosive Sublimate.
Cantharides.

2nd Part.

Cyanide of Potassium and all Metallic Cyanides.
Oxalic Acid.
Chloroform.
Belladonna and its preparations.
Laudanum.
Opium and all preparations of Opium or of Poppies.
Arsenical preparations except Green and other coloured Paints and Pigments.
Essential Oil of Almonds, unless deprived of its Prussic Acid.

Reviews.

THE MATERIA MEDICA OF THE HINDUS, compiled from Sanskrit Medical Works, by UDOY CHAND DUTT; with a GLOSSARY OF INDIAN PLANTS, by GEORGE KING, M.B., F.L.S., and the Author. Calcutta: Thacker, Spink and Co. 1877.

This work appears to have been written partly to show the extent of knowledge obtained up to the present time by Hindu physicians from their own practice and observation, and partly to enable European medical men to get some idea of the nature and composition of the medicines of which they hear only the native name, for it often happens in India that an European doctor is called in to see a patient who has already been treated by a native practitioner before coming under his care.

In the somewhat lengthy but very interesting preface, the author gives a sketch of the history of Hindu medicine and of the more important native works on the subject. An introduction follows which gives information as to weights and measures and the various ways in which medicines are applied or administered by the Hindus. The materia medica portion is arranged in the usual manner, the inorganic substances being first treated of and then those derived from the vegetable kingdom.

Although the author modestly describes the book as a compilation from standard Sanskrit medical works, he has evidently brought very considerable personal knowledge to bear upon it, availed himself of all possible sources of information, and exercised great discrimination in distinguishing between the practical uses of the drugs and those which are only occasional, or in many cases only theoretical. The author has evidently taken great pains also to make the work as trustworthy as possible, having given the original Sanskrit text in foot notes, so that the reader may be able to compare it with the translations given.

The articles of vegetable materia medica have been carefully identified by having authenticated specimens from native physicians compared with plants in the Royal Botanical Gardens at Calcutta, under the able superintendence of Dr. King. So carefully has this work been done that some plants, the identification of which was doubtful, have been omitted from the list. The characters of the drugs themselves are not described, but full details are given of the method of preparing them and of the way in which they are used. The absence of descriptions by means of which the various substance might be identified is the only thing wanted to make the work as complete as possible, since the same native name is often applied to several distinct drugs having the same leading characteristic property. Dr. Dymock's recent papers in this Journal will, however, amply make up for this deficiency.

Much interesting information will be found scattered throughout the book; the general tenor of it shows that the Hindus are far in advance of many other Asiatic peoples in their knowledge of the properties of medicine, and that they use with boldness and skill many powerful medicines, such as arsenic, aconite, mercury, etc.

A very comprehensive glossary of the native names of Indian plants in Sanskrit and the vernacular, with their scientific equivalents, and a good index, conclude a work which should be in the hands of every European physician in India, and which from its intrinsic value should find a place in every medical and pharmaceutical library.

Elements of Dental Materia Medica and Therapeutics, with Pharmacopœia. By James Stocken. London: J. and A. Churchill. 1877.

This little work was first compiled for hospital use, at the request of the medical staff of the National Dental Hospital and afterwards published in sections in the *Monthly Review of Dental Surgery*. It now appears in a revised form before the public. The materia medica occupies the larger portion of the book and comprises nearly a hundred subtances, the remainder being occupied with the dental pharmacopœia and numerous tables. The latter enumerate the number of drops of different liquids equal to one drachm of water; the proportionate doses of medicine for children and adults; the normal respiration and pulsation at different ages; antidotes for poisons, and a glossary of terms used, etc. The index is very complete and gives also the doses of each remedy. The work is evidently very carefully compiled and is brought quite up to the most recent advances in dental science; thus monobromo-camphor, gelsemium, croton-chloral hydrate, amyl nitrite, phenate of soda, and thymol are found amongst the materia medica, and the chapter upon nitrous oxide, in particular, occupies several pages, and is replete with valuable information. The remarks under the articles of materia medica include the chemical formulæ, physical and chemical characters, mode of preparation, therapeutical effects, and uses and doses, and while briefly and clearly put, comprise all that is necessary for practical purposes. There are one or two trifling omissions which will perhaps be noticed. Thus, croton chloral is still retained under its old name, although it is now known to be butyl chloral; for antidotes to aconite the reader is referred to the table of antidotes, where that drug is not mentioned; calendula is mentioned in the pharmacopœia but not in the materia medica. In the table of approximate measurements a teaspoon is supposed to hold one drachm, and a tablespoon half a fluid ounce, without any remark being made upon the well-known fact that modern spoons hold nearly double those quantities. The term gelsemin is applied by the author to the crude drug instead of gelsemium, although the former name properly belongs to a so-called resinous principle, obtained from the root and used by the Eclectics in the United States. With these exceptions, however, the book appears to be as perfect as possible, and will, we feel sure, speedily reach a second edition. The formulæ in the pharmacopœia will doubtless be found very useful to chemists, and no dentist ought to be without this admirable little treatise.

Notes and Queries.

[574]. Transparent Cement. (From the *Polytechnisches Notizblatt*. Best transparent gelatine cut small and warmed in a china dish with a little acetic acid until fluid, will make a good cement.

In using it the pieces to be cemented must be warmed and painted by means of a camel hair pencil with the warmed cement, and allowed to dry for twelve to twenty-four hours.

Hugo W. Langbeck.

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[575]. CHERTIER'S COPPER.—In answer to Mr. Walter Slicer, Chertier's Copper is a compound used in pyrotechny, and bears the name of its inventor; a formula for its preparation may be found in a work on the 'Pyrotechnic Art,' by that author. I, however, give one below:—

Sulphate of Copper in fine powder	. .	7 lbs.
Chlorate of Potash ,,	. .	7 ,,
Solution of Ammonia, sp. gr. ·880	. .	2 ,,

To the powders intimately mixed, the ammonia is added, and the pasty mass thus formed is to be dried with a gentle heat (about 120° Fahr.); for if a much greater heat is employed, the compound is liable to spontaneous combustion, occurring in the first instance, by the appearance of brownish-black spots, which shortly kindle into a smouldering fire.

Peckham Rye. Henry Child, F.C.S.

A similar answer has been received from Mr. C. J. H. Saunders, Mr. R. Knowles, Mr. Princep, and from Mr. Baxter.

Dispensing Memoranda.

[54]. Creasote Pills.—I have waited to see the result of the replies to this query with some interest, but seeing the summing-up in "The Month" in favour of light magnesia, I cannot let it pass without expressing my very strong objection to it. I have made creasote pills both with light magnesia and with slaked lime, but in either case the creasote is almost entirely combined, and pills made with either excipient are as insoluble as marbles; I have boiled them or some time with water without altering their shape. With bees' wax, the results are not much better. I have found the best results are obtained from powdered animal soap, B.P. Mix in a stoppered bottle and digest in a water-bath equal parts of creasote and the soap. This on cooling makes a suitable plastic mass for forming pills, and mixed with an equivalent quantity of the species for compound rhubarb pills readily forms the pill—not a bolus—referred to. This will be readily soluble, and the creasote will exist as creasote in the pill—what the prescriber intends.

Wm. Martindale.

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[58] I have made the mixture referred to by "Beta," without any inconvenience, by dissolving Pot. Iod. and Pot. Bic. in a little water, and the Ferr. Amm. Citr. separately in a mortar, then mixing the two solutions together, allowing them to remain for a short time, when

all effervescence will have ceased. The mixture made thus has stood upon the counter for several days without any alteration.

I can hardly agree with "Nil Desperandum," because physicians of the present day are as a rule well up in chemistry, and would not prescribe such ingredients without knowing the result.

Bristol. VERITE SANS PEUR.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

DEATH POINT OF BACTERIA.

Sir,—Mr. Willmott heads his first letter "Death Point of Bacteria," and in that letter states that, "Bacteria and their germs were utterly destroyed when placed in a temperature of 150° F. and upwards, providing that the heat were constantly applied for a period of from three to six days," and this he claimed as his "new point in the inquiry." In the *Pharmaceutical Journal* of the following week I called in question the novelty of this process for the destruction of bacteria. In Mr. Willmott's reply of last week he adopts a totally different title to that of his former letter, and no longer calls it the "Death Point of Bacteria," but the "Extinction of Germ Life," and, moreover, states that it is a common error to confound bacteria with bacterian germs. The error in this instance is his own. I have quoted his words, the "death point of bacteria," and though he mentions germs the prominence is given to bacterian life. It will be seen how the matter now stands if I give the exact words of his last communication:—

"It was not the destruction of bacteria but the prevention of their development in nutritive fluids at a low degree of heat sustained over a given period that constituted the novelty set forth in these investigations."

This, then, must be accepted as the correct definition of what is claimed as new, although it differs materially from the former one. The prevention of bacterian life is one thing, the destruction of that life after its appearance quite another.

I shall confine myself to the results obtained by the same two authors I quoted on a former occasion, but shall confine myself mainly to Bucholtz.

In the investigations of Leonid Bucholtz on the "Influence of temperature on bacterian vegetation," he used six flasks, and placed in each fluid suitable for the development of bacterian life. Two of these flasks were subjected to a temperature of 60° C. (140° F.) continued for three days. The fluid showed no signs of bacterian development, and continued in the same state several days. The other flasks, subjected to lower temperatures, gave evidence of active bacterian development.

Cohn, as the result of careful examination, states that in a suitable fluid which had been subjected to a temperature of 60°—62° C. (140—143° F.) no bacteria developed themselves.

Do not these experiments on bacterian life show the "prevention of their development in nutritive fluids at a low degree of heat sustained over a given period"? If so, do they not cover the ground occupied by Mr. Willmott in the process which he considers a novelty?

Mr. Willmott gives evidence of confusion in his own mind with regard to this subject, and he has yet to prove whether the non-development of bacteria in a suitable fluid be due to the destruction of bacterian germs by heat or to the fluid being rendered by that heat unsuitable for the development of bacterian germs.

If Mr. Willmott's object be the elucidation of truth, personal matter is out of place. It can but weaken an argument used or supply the place of an absent one.

A writer is at perfect liberty to quote from any author, home or foreign, and in referring to the published works of Dr. F. Cohn I refer to those of a man of European reputation on infusoria and the biology of plant life. Leonid Bucholtz was a student of medicine in the Dorpat university. He undertook a series of experiments with the view of determining the influence of temperature on bacterian life.

I have now said my last say on this subject, and I think it is sufficient to prove that "whatever other merit the process may claim it lacks that of novelty."

THOMAS GREENISH.

20, *New Street, Dorset Square,*
Jan. 31, 1878.

AN ASSISTANTS' SECTION.

Sir,—Some time ago the Council of the Society very generously gave permission for a meeting to be held in the Lecture Theatre for the purpose of inaugurating a chemists' assistants' association.

As a quiet observer, and in common with very many others, it has, I am sure, afforded me and all the well-wishers of the assistants' section much pleasure to witness its progress.

But the question has, I think, now assumed rather a wider range, and in a recent number of the Journal a valuable suggestion came from Edinburgh, asking whether it was not possible to establish an association for the entire body of chemists' assistants. Our Edinburgh and Glasgow friends have shown, as usual, that they are always to the front on educational and all other subjects relating to the welfare of pharmacy, and the establishment of an annual supper for assistants is no mean contribution to the social and friendly co-operation which all such gatherings must help on and develop.

But the question has arisen with me to know whether it would not be possible to establish a federation of all the local associations into what I am disposed to believe would work best as an Assistants' Section of the Pharmaceutical Society. In which case I presume the whole thing should be worked by assistants, with the head centres in London and Edinburgh, when no doubt it would be necessary to have permanent secretaries, with an assistant secretary, *pro tem.*, and local secretaries in all towns sufficiently large to organize a local association affiliated with the parent societies.

There might be one annual subscription, and in case of an assistant who may be a member of any local association removing from that to any other town, or coming up to London, he should, on producing his ticket of membership, be admitted without further payment for the current year to the association in the town or city to which he is a new comer.

Surely, sir, there is abundant material, if rightly fitted together, to build up and found an assistants' section on the bulwarks of the Pharmaceutical Society.

This object would probably be best attained if all interested in the subject throughout Great Britain would contribute to your pages the various ideas which may be passing in their minds on this subject; and permit me, sir, especially to commend it to the consideration of those gentlemen of the Council, and our esteemed President, who are so well and so widely known for their desire to promote all schemes having for their object the advancement of the young men, assistants in pharmacy. *Apropos* of this subject, I am glad to learn that the London chemists' assistants' association intend giving a *soirée* in February of a scientific and social character.

"This is good news for the new year."

LONDON.

E. T.—Linimentum Æruginis, P. L.

F. R.—See the article on Acetic Acid in Ure's Dictionary, vol. i.

J. Higgins.—The book is in the Library of the Pharmaceutical Society. The proportions vary so with the wood employed that to give a figure as representing the average would be misleading.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Ivatts, Mr. Durrant, Mr. Lauria, Mr. Abraham, Mr. Bennett, Mr. Bates, Mr. Taylor, Mr. Bunker, Emplastrum, W. W. B., C. J. B., F. H. J., A. P. S.

THE PROGRESS OF CINCHONA CULTIVATION AND ALKALOID PRODUCTION IN BENGAL.*

BY C. H. WOOD, F.C.S.,

Professor of Chemistry, Medical College, Calcutta; Quinologist and Chemical Examiner to Government of Bengal.

At the request of the officers of this Society, I have undertaken to bring before you to-night some account of the progress that has been made in the cultivation and utilization of the cinchona species in Bengal. In fulfilling this engagement, however, I am unable to do more than summarize information that has been already to some extent published in the reports to the Indian Government. But as the questions that have been thus brought under official consideration have involved some points of considerable pharmaceutical interest, they may furnish a few points worthy of discussion at this meeting.

The first attempts at the cultivation of cinchona in Bengal were made by Dr. Anderson, the Superintendent of the Botanical Gardens, Calcutta, in the year 1861, with some seed received from Kew.† Thirty-one plants were thus obtained. In the same year Dr. Anderson was sent to Java to study the system of cultivation adopted there, and to convey some plants from that colony to India. Part of these Java plants were afterwards taken by Dr. Anderson to Ootacamund in the Madras Presidency, where cinchona cultivation was already progressing under Mr. MacIvor, and were exchanged for plants of other species. The total number of plants thus collected and reared in Calcutta from these different sources amounted at the commencement of 1862 to 289 plants, comprising of course several species. The permission of Government was then obtained for the removal of these plants to Sikkim for the purpose of establishing a permanent plantation on the slopes of the Himalayas. Here Dr. Anderson laboured untiringly for a considerable time towards the accomplishment of his object, and after encountering many obstacles ultimately succeeded in finding a suitable locality in the valley of Rungbee, twelve miles distant from Darjeeling. The first little patch of 500 cinchonas was planted on this site during the latter half of 1864. At that time the valley was a dense and little known forest, utterly without roads, and only approached by cutting a path for miles through an impenetrable mass of vegetation. Moreover appliances of every kind necessary for plant cultivation had to be brought up from Calcutta, involving frequent and vexatious delays, the time usually occupied in the transit being a couple of months. All these early difficulties were mastered by the energy of Dr. Anderson, ably seconded by his assistant, Mr. Jaffray. Since 1866 the executive charge of the undertaking has been in the hands of Mr. J. Gammie, and to his great practical skill under the scientific direction of the Superintendent of the Botanical Gardens, the rapid development of these plantations is mainly attributable. At the present time the total number of cinchona trees growing is in round numbers 3,000,000, covering a total area of about 1900 acres.

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Feb. 6, 1878.

† The history of cinchona cultivation in Madras and Bengal has been admirably told by Dr. King in his 'Manual of Cinchona Cultivation' published by the Indian Government, from which I have taken these dates.

The earliest species of cinchona placed under cultivation at Rungbee were the *Pahudiana*, *Officinalis*, *Micrantha*, *Succirubra* and *Calisaya*. The bark of the *Pahudiana* was ultimately proved to be comparatively worthless, and the cultivation of this species therefore has been long since abandoned. The *Officinalis* was well known to furnish one of the most valuable quinine yielding barks, and its propagation was carried on vigorously for some time, but the result showed that the plant would not thrive under the climatic conditions of Sikkim. Experiments were also tried with some plants of *C. Pitayensis*, but failed, and attempts at the cultivation of both these species had to be discontinued. The *Micrantha* species and its allies yielded a bark rich only in cinchonine, which is certainly the cheapest and reputedly the least efficacious of the cinchona alkaloids. There was no sufficient inducement therefore to extend its cultivation.

The *Succirubra* has been deemed a really useful species, and its cultivation in Sikkim has proved a decided success. It is hardy, growing well under a sufficiently wide range of conditions, it seeds freely, and from its little disposition to run into varieties, it can be easily propagated. Thus the extension of succirubra in Sikkim has gone on rapidly.

Cinchona Calisaya, from its yielding a bark rich in quinine and containing but a small proportion of other alkaloids, is undoubtedly the most valuable species for cultivation in Bengal. But it grows under more limited conditions than succirubra, is more difficult to propagate, and has therefore not made anything like the same progress. Unlike succirubra it displays a great tendency to furnish a number of varieties, and these do not yield bark of equal value.

Analyses of the bark from six of the leading varieties in 1874 gave the following results:—

Cinchona Calisaya Varieties.	1	2	3	4	5	6
Total Alkaloid	1·6	6·1	5·57	7·1	5·75	7·4
Alkaloid soluble in Ether	0·82	5·9	5·21	6·93	5·75	7·4
Crystallized Sulphate of Quinine	None.	4·53	4·6	6·92	5·34	6·2

It is obvious that the bark from the best of these varieties would be admirably adapted for the manufacture of a pure sulphate of quinine by a simple process, and if it could be produced in sufficient quantities, all that the Government of India desire could be readily accomplished. Steady attention, therefore, is now being given, under the able direction of Dr. King and the personal superintendence of Mr. Gammie, to the propagation and extension of the good varieties of calisaya; it is too soon yet to form an opinion on the measure of success likely to be obtained, but there is reason to hope that in the hands of these highly skilled officers the difficulties of cultivation will be overcome, and that large areas of good calisayas will ultimately reward their efforts. In any case, however, several years must elapse before the bark of this species can be obtained in sufficient quantity for practical utilization on the large scale; meanwhile, therefore, the produce of *succirubra* is the only bark really available for economical application.

This species, as I have already stated, has made the most rapid progress from its hardy character and the ease with which it can be propagated.

The total number of succirubra trees growing is estimated in round numbers at 2,500,000. In the progress of cultivation a certain amount of bark was annually obtained from these by the necessary processes of pruning and thinning; and in 1875-76, in addition to that got by such means, a crop of bark was taken by cutting down and stripping a large number of trees. The following table shows the total amount of dry succirubra bark yielded by these plantations up to the end of March, 1876:—

		lbs.
Collected by pruning and thinning during	1869-70—	2,400
,, ,, ,,	1870-71—	12,500
,, ,, ,,	1871-72—	39,000
,, ,, ,,	1872-73—	*nil.*
,, ,, ,,	1873-74—	16,000
,, ,, ,,	1874-75—	39,405
Crop of 1875-76	—	211,931
	Total—	321,236

During the end of 1874 and the beginning of 1875, a number of experiments were conducted with a view of determining somewhat accurately the amount of succirubra bark that could be annually harvested without injuring the plantations. For this purpose a large number of trees of different ages were cut down, and the bark stripped from each separately weighed in the green state. Every precaution was taken that the trees selected should fairly represent the whole. The results are given in detail in the Quinologist's report, May 24, 1875, from which I will simply extract the following table:—

AVERAGE WEIGHT OF DRY BARK PER TREE, AT DIFFERENT AGES.

	Bark peeled from stem and large branches	Bark scraped from small branches.	Total.
Trees planted in 1866	2·52 lbs.	0·41 lbs.	2·93 lbs.
,, ,, 1866	2·06 ,,	0·38 ,,	2·44 ,,
,, ,, 1867	2·27 ,,	0·33 ,,	2·60 ,,
,, ,, 1868	1·05 ,,	0·34 ,,	1·39 ,,
,, ,, 1869	1·01 ,,	0·33 ,,	1·34 ,,
,, ,, 1870	0·92 ,,	0·39 ,,	1·31 ,,
,, ,, 1871	0·34 ,,	0·12 ,,	0·46 ,,
,, ,, 1872	0·26 ,,	0.12 ,,	0·38 ,,

The bark of the roots was not taken in these experiments. This table shows, therefore, the *average* weight of dry stem and branch bark yielded per tree of each successive year's planting; but this average includes a very wide range. Thus, taking the trees of 1866 at Rishap (of which 389 were cut for experiment), 2·32 per cent. yielded from 5 to 6 lbs. of peeled bark each; 41·9 per cent. yielded from $1\frac{1}{2}$ to $2\frac{1}{2}$ lbs. each; and 12·85 per cent. furnished only 6 to 12 ounces each. It should be remembered that a small addition has to be made to these figures for the amount of bark that has been already taken from trees of seven or eight years' growth, by occasional pruning. This probably does not exceed 2 or 3 ounces per tree. From the data thus collected, after making liberal allowances in different directions, it was estimated that if all the trees were regularly cut at the completion of their seventh or eighth year (a corresponding proportion being at the same time planted out), an annual crop of 366,000 lbs. of bark could be safely taken without diminishing the permanent value of the plantation. Some independent observations since made by Dr. King, in a different manner, have corroborated these results.

The bark crop has been hitherto taken either by coppicing or by the entire uprooting of the trees. In the latter case, the bark of the root is obtained as well as that of the stem and branches, with the further advantage that by the digging up of the roots the ground is very thoroughly broken and turned over, thereby probably rendering it more suitable for fresh planting. In coppicing, the trees are cut down pretty close to the ground, when new shoots are thrown up from the old roots, and under suitable treatment, these ultimately thicken into good stems. Much of course has yet to be learnt respecting the relative economy of these methods, and both admit of several variations. Many years must probably elapse before the most advantageous plan of harvesting is decisively known.

The quality of the succirubra bark thus obtainable has also been made the subject of considerable investigation, of which I can only indicate the general result. Samples of bark taken from the lower part of the stems of the finest trees of different ages have yielded the following percentages of total alkaloids:—

		Total Alkaloid.
No. 1 trees planted in	1866 . .	6·7 per cent.
,, 2 ,,	1867 . .	7·3 ,,
,, 3 ,,	1868 . .	6·8 ,,
,, 4 ,,	1869 . .	6·6 ,,
,, 5 ,,	1870 . .	6·6 ,,
,, 6 ,,	1871 . .	6·0 ,,
,, 7 ,,	1872 . .	7·7 ,,

The total alkaloid from Nos. 1, 6 and 7 of these, yielded the following products:—

From 100 parts of Dry Bark:—	No. 1 (1866)	No. 6 (1871)	No. 7 (1872)
Total Alkaloid	6 7	6·04	7·68
Alkaloid Soluble in Ether . . .	2·4	2·73	2 17
Cinchonidine	1·9	1·99	2·95
Cinchonine	2·4	1·31	2·56
Crystallized Sulphate of Quinine	1·3	1·35	0·82

Experiment, however, has shown that the proportion of total alkaloid is greatest in the bark of the root, and diminishes as we go up the stem to the branches. The composition of the total alkaloid also varies appreciably, according to the part of the tree from which the bark is taken. Our observations on these points closely confirm some results recently published by Mr. David Howard in the Journal, and I need not therefore dwell further upon them. It follows from such observations, however, that we cannot expect the entire bark crop to furnish the amounts of alkaloids just given. Numerous analyses of samples taken from bark actually harvested indicate that the average yield of the plantations contains from 4 to 5 per cent. of total alkaloids the average composition of which may be represented as follows:—

Quinine	16·31
Cinchonidine	30·53
Cinchonine	35·26
Amorphous Alkaloid	17·90
	100·00

From all the facts that have been thus collected then it results that these plantations are now capable of annually yielding 366,000 lbs. of dry succirubra bark containing an average of 4 per cent. of total alkaloid.

The Government of India having determined to employ this bark in the preparation of a cheap medicine for the use of the fever-stricken population, experiments on a large scale have been in progress for the past three years to determine the best and most economical form of febrifuge obtainable from it. It is seen that the bark of succirubra yields several different alkaloids in nearly equal proportions. It has been clearly proved that all the cinchona alkaloids possess, in a greater or less degree the febrifugal properties of quinine. It was reasonable to infer, therefore, that if the alkaloids of succirubra were extracted as a whole and issued in some convenient form, they would be likely to constitute a valuable and efficient remedy. It was obvious that if such an aggregate of alkaloids possessed anything like the febrifugal powers of quinine it would be the most economical product obtainable from the bark in hand. A similar preparation had been for some time made in Madras from the surplus bark of the Nilghiri plantations, but, chiefly from causes dependent on the process adopted for its production, it had not been deemed economical or convenient, and the manufacture had been stopped. In presence of this experience it will be understood that a fresh attempt in the same direction was not made without mature deliberation based on a considerable series of experiments. But it was found that by employing an entirely different mode of procedure, more convenient physical properties could be given to the product with less cost in manufacture. Without entering into details, I may at once state that the general nature of the process provisionally adopted is to exhaust the dry bark by successive treatment with dilute hydrochloric acid and to precipitate the resulting liquor with an excess of caustic soda. The precipitated alkaloids are collected on filters, washed, dried and powdered. This product is then dissolved in a quantity of acid just sufficient to take up the alkaloids, filtered from some insoluble colouring matter, and the solution again precipitated. After washing, drying, and grinding, a fine white powder is obtained, which, however, acquires a slight buff tint by keeping. It never agglutinates in any way, even in the trying climate of India. It is freely soluble in weak acids, and is readily taken up by lemon juice, which constitutes a pleasant vehicle for its administration.

This preparation, under the name of "cinchona febrifuge," was first issued to the hospitals of Calcutta for trial, and a considerable quantity was also sent to Burdwan. The reports received from Drs. Chevers, Ewart, Bird, and French clearly showed that in their opinion it possesses to very nearly the same extent the antiperiodic properties of quinine, and might be safely substituted for the latter in the treatment of ordinary fever and ague. Since then it has been extensively distributed among the medical officers of Bengal, and a preponderating mass of testimony in its favour has been received. But, as must necessarily happen in such cases, adverse opinions have been also expressed. These in some cases have clearly arisen from misapprehension or want of pharmaceutical knowledge. Some of the objections that have been urged against it, however, are now under investigation, and experiments are still in progress for the purpose of determining whether these alleged objectionable qualities are really dependent on the composition of the product or are attributable to the methods of administration. I believe it is now the general opinion of those who have used it largely that it should not be given in larger doses than would be administered of quinine. The Surgeon-General of Bengal, after a long and careful examination of the medical reports on its efficacy, has declared it to be a valuable efficient febrifuge, and has ordered it to be used in all the Government hospitals and dispensaries under his control. About 5000 lbs. have been already made and issued; it is now being manufactured at the rate of 4000 lbs. a year, but the current demand is rapidly overtaking this scale of production, and a further extension will soon be necessary. As yet only temporary means are employed in its manufacture, and the full measure of economy has therefore not been attained. Its cost price at the present time is one rupee per ounce (1*s.* 9*d.*).

In forming an opinion of the value of this preparation it should be regarded as a pharmaceutical preparation rather than as a chemical product. It contains all the required medicinal properties of the crude drug in a concentrated and convenient form for administration. The attainment of this object is, as I understand it, the true aim of pharmacy. The cinchona febrifuge is not intended to be a substitute for quinine but a supplement to it. Pure quinine is undoubtedly the best known, and, for that reason, the most trustworthy specific against fever. But quinine is simply unattainable in quantities sufficient to alleviate a tithe of the suffering that results from fever in India.

On this point I would quote the following words from Dr. King:—"It is probable that for very severe and critical cases of malarious fever, especially amongst Europeans, sulphate of quinine will long remain in the estimation of the medical profession the best remedy; but every one who has had much experience of India knows that bad cases of fever are more the exception than the rule, and that there is simply an incalculable amount of fever prevalent amongst the natives of the country which rarely takes the form of a violent or fatal attack, but which expends itself in a succession of attacks, each sufficient to incapacitate the sufferer from work for a time, and a repetition of which too often ultimately induces malarious cachexia and disease of the spleen. There appears to be ample medical evidence for believing that, for malarious fever of this ordinary type, the 'cinchona febrifuge' is a most efficient remedy. Everybody who knows much of rural life in this country must also be aware that at present the great majority of such attacks of fever receive no medical treatment whatever, or at least none of an efficient kind, and for the simple reason that no febrifuge is accessible to the sufferers. Quinine is a costly drug, quite beyond the means of a large proportion of the population. Moreover it is not to be had except at dispensaries and in large bazaars in neighbourhoods where Europeans happen to be settled. It is no exaggeration whatever to say that, to three-fourths of the population of India, quinine is simply unobtainable even by purchase."

I have already shown that our efforts are being directed to the extension of calisaya with a view to provide a more abundant supply of this alkaloid. In the meantime, from 10,000 to 12,000 lbs. of the succirubra febrifuge can be annually issued, which there is every reason to believe is quite powerful enough to arrest the ordinary fever and ague of the country.

[*The discussion on this paper is printed at p.* 638.]

A SPURIOUS BALSAM OF TOLU.*

BY W. A. H. NAYLOR.

A few months ago Mr. Holmes had sent to him a viscid resinous-looking body, accompanied by a note. This communication explained that the sample forwarded had been supplied by a wholesale firm as balsam of tolu. The purchaser suspecting it was not genuine, wrote to the firm to apprise them of their mistake, when to his great astonishment he received a reply assuring him that the article referred to was genuine balsam. At first, a study of the physical characters of this suspected balsam alone was made, but as these afforded no clue to its recognition, a chemical examination was deemed a necessary supplement. For this purpose it was handed over to me, and having pursued the inquiry to a fixed point I now submit the results. This spurious balsam when seen in bulk is yellowish-brown in colour; in thin layers it is perfectly transparent and of a golden yellow. It is extremely viscid, in this respect bearing some resemblance to bird-lime, from which, however, it differs in not possessing the properties of caoutchouc. By keeping it hardens but little, and does not become brittle when exposed for some days to a temperature of 100° C. Its odour is not balsamic but reminds one rather of glue, and becomes more strongly developed upon warming. Its taste is not perceptible at first, but when chewed a few seconds, it produces a sensation of warmth and acridity. A thin layer examined under the microscope after it had been exposed for three or four hours to a temperature of 90° C., showed no crystalline matter after standing some time. It is completely soluble in carbon bisulphide, benzol, chloroform, and ether; glacial acetic acid and potash solution act as partial solvents. Boiling alcohol of 90 per cent. dissolves it entirely, but the solution deposits upon cooling. The ethereal and alcoholic solutions have a distinctly acid reaction. The balsam melts at 58° C. Strong hydrochloric and nitric acids produce no apparent effect upon it in the cold; strong sulphuric acid develops a cherry-red colour. When treated repeatedly with boiling water, filtered while hot, the filtrate remained clear, had a neutral reaction, and when evaporated left no residue.

Distilled with a mixture of bichromate of potash and sulphuric acid, no oily liquid passed over, and no odour of bitter almonds was evolved. It contains no constituents volatile at a temperature of 160° C. Boiled for some hours with a strong solution of caustic potash it saponifies. If the soap is salted out repeatedly until free from excess of alkali, then decomposed by sulphuric acid, no oil globules can be seen, nor does the separated resin leave a grease spot when applied to bibulous paper. If it is shaken up with weak ammonia solution, filtered, and the filtrate slightly acidified with dilute sulphuric acid, a light pink colour quickly develops. If potash is used in place of ammonia, or free dilute acid alone, the colour is not produced. In this particular it corresponds with balsam of tolu, but it differs in that no colour is developed in the true balsam, if it is first well washed with hot water. Digested for two days in weak spirit, the clear liquor removed by a pipette, the insoluble portion kneaded, then treated with hot alcohol and exposed in a cool place for twenty-four hours; the deposit examined under the microscope, presented no crystalline appearance. These are conditions under which colophony readily assumes the crystalline condition. The absence of organic acids, volatile and fixed oils, together with the difficulty of effecting crystallization, suggested the advisability of attempting a separation of the resins, provided the body was not a simple one. A few preliminary experiments with weak potash solution, spirituous solutions of acetate of lead and copper, sufficed to show the complex character of the resin and to indicate a probable method of fractionation. That acid and indifferent resins were both present was ascertained by kneading with a glass rod a portion of the balsam with weak ammonia solution, adding repeated solutions of chloride of sodium, and filtering; the filtrate, when acidified with an acid, became turbid through the separation of resin particles, the alcoholic solution of which had a distinctly acid reaction. This mode of separating the acid from the indifferent resins was not followed on account of the inconveniently large quantity of chloride of sodium solution required to precipitate completely the neutral resins. Filtration without the salting process was impracticable—so perfect an emulsion was formed, that after standing three days there were no signs of a deposit. To effect this separation, advantage was taken of the solubility of the lead compound of the acid resins in cold alcohol of 90 per cent. From this solution, the mixture of acids was obtained in a free condition by decomposition with sulphuretted hydrogen. The mixture of acid resins thus obtained was precipitated by a spirituous solution of acetate of copper, the copper compound decomposed by sulphuretted hydrogen, filtered, and half the quantity of copper acetate solution necessary for complete precipitation added to the filtrate. It was allowed to stand, filtered, and the remainder of the copper acetate solution added to the filtrate. The respective compounds were decomposed by sulphuretted hydrogen, their solutions evaporated, and the melting points of the corresponding resins ascertained. The indifferent resins were fractionated in a similar manner. Operating in this way until accordant results were obtained, two acid resins were separated, one melting at 55° C.; the melting point of the other could not be accurately determined, on account of its want of uniformity. In addition to these an indifferent resin separated melting at 63° C. None of the fractions separated emitted a terebinthinate odour when warmed. The portion of balsam insoluble in cold alcohol was too small in quantity to admit of further examination.

Every attempt was made to identify this spurious balsam, by comparing it with resinous bodies known to be employed in medicine or the arts, but without success. That it is not a commixture of two or more resinous substances, artificially prepared, may be inferred from its uniform behaviour towards solvents, the persistent and unchangeable character of its odour when heated, and the constancy of the melting points of the fractions. That it is not balsam of tolu is certain. The author therefore ventures to suggest the probability that this substance is a natural product of new importation, and not a tampered or manufactured article.

The circumstances under which this spurious balsam was vended are such as may occur again; to caution pharmacists, therefore, against making a false purchase, as well as to supply means of distinguishing between the genuine and a substitute, is the object of this note. I cannot conclude without expressing my obligations to Messrs. Corbyn, Stacey and Co., in whose laboratory this examination has been made.

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Feb. 6, 1878.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 9, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE PRELIMINARY EXAMINATION.

WE have for some time past entertained the belief that any one who reads through the questions put to candidates presenting themselves for the Preliminary examination might reasonably be expected to recognize an absence of anything that could be regarded as superfluous and calling for a higher degree of scholastic teaching than is consistent with very moderate views as to the requisite qualifications of a youth entering upon the business of a pharmacist. The recent transfer of the conduct of the Preliminary examination to the College of Preceptors has also contributed to strengthen this belief; for since the subjects dealt with are essentially scholastic, it may fairly be inferred that those who are actively and habitually engaged with scholastic duties would be better fitted to conduct the examination than persons who had not that opportunity of appreciating the acquirements of school boys and making due allowance for their deficiences.

To judge, however, from some letters we have received in reference to the failures in the Preliminary examination, it appears that in some quarters very different views prevail. One of our correspondents, referring to the preponderance of failures, expresses his "astonishment that this state of matters should have so long been allowed to exist, without any apparent remedy being attempted," and though he does not advocate a lowering of the standard, he suggests that the Pharmaceutical Society might institute a system of classes specially preparatory for the examination, at least in the more important, if not in all, the centres where it is held.

Another correspondent, referring to the fact that out of 313 candidates who presented themselves at the last examination, 192 failed to pass, goes so far as to ask whether the examination has been a fair and honest one, whether the papers have been judged on their general merits, or whether some catch question has been the rule and guide of one or more of the examiners. He also expresses the opinion that many will incline to this latter view, and he candidly confesses himself to be among the number.

This subject was brought before the Council last Wednesday, and some facts were elicited which, together with a consideration of the questions* put at the examination referred to, will enable our readers to judge how far there is any foundation for the opinions expressed in the letters above-quoted from, and whether there is any adequate reason for regarding the number of rejections as being an injury to the trade or even a hardship to the rejected candidates.

It appears from the data furnished by the Secretary, that out of the 192 who failed, 41 did not obtain the pass number in Latin, 101 failed in English, and 167 failed in arithmetic, while 23 of these latter did not obtain a single mark in that subject. Since the failures in the Preliminary examination have been lately made a ground of remonstrance by the Glasgow Association, it will not be out of place to mention that out of 42 candidates in Scotland, not less than 31 failed to pass the Preliminary examination, and as pointed out by the President, the deficiences in regard to arithmetic were even greater in the North than in the South. This result is nothing exceptional, for it appears from the examination report for October, 1876, that on that occasion the report of the examiner stated that the Latin translation was moderate, the grammar generally pretty good, the English satisfactory, and the spelling correct, while in arithmetic there was more deficiency.

As regards the questions, it can scarcely be contended that they furnish any justification for the idea that they are in any way extraordinary, or that the examination is so strict as to create any difficulty in securing desirable apprentices, neither can we conceive that there is any room for the suspicion of unfairness in judging the candidates' papers. On the contrary, the only reasonable and even possible inference seems to be that the rejected candidates did not possess that moderate acquaintance with their own language, and with the simple rules of arithmetic, which is demanded by even the most modest estimate of a pharmaceutical pupil's qualifications. We are inclined therefore to regard these rejections —however much they may be regretted for the sake of the individuals—as operating to the advantage of the general body rather than the reverse. It is, we believe, only by the maintenance of the examination standard that the practice of taking as apprentices lads of deficient education can be done away with, and whether the failures in the Preliminary examination are due to the prevalence of this practice or to the generally defective nature of our middle class education we cannot perceive that as regards the well-being of the trade there is any reason for the lamentations which are from time to time heard on the subject.

* See before, p. 592.

A DENTAL PRACTITIONERS' BILL.

ON Wednesday week a Bill was introduced into the House of Commons by Sir JOHN LUBBOCK, and read a first time, which deals with a subject of considerable interest to many chemists and druggists, as it shadows forth an important alteration in the law relating to the practice of dentistry.

The Bill provides for the compilation and keeping of a "Register of Dentists," and restricts to persons registered the use of the title of "dentist" "dental surgeon," "dental practitioner," or any title or description implying that the person using it is specially qualified to practise dentistry, the penalty for an offence, after the 1st of August, 1879, being a fine not exceeding £20. After that date also fees for dental operations or advice are not to be recoverable except by registered persons.

The qualification for registration proposed is the licentiateship in dental surgery or dentistry of any Royal College of Surgeons in England and Wales, or of the Faculty of Physicians and Surgeons of Glasgow; or the being *bonâ fide* engaged at the time of the Act passing in the practice of dentistry, either "*separately* or in conjunction with the practice of medicine or surgery," and furnishing satisfactory evidence of the fact before the 1st of August, 1879. It may be remarked *en passant*, that the words between inverted commas, especially the first, are very ambiguous, and might be construed most disadvantageously to many who practise dentistry but do not carry it on as a separate profession or in conjunction with medicine or surgery.

Registration is to be made by local registrars appointed by the General Council of Medical Education and Registration, established under the Medical Act, 1858, and such registrars are to be empowered to demand and receive a fee not exceeding £2 in respect of the registration of any person applying before the 1st of January, 1879, and a fee not exceeding £5 in respect to the registration of any person applying after that date. The local registrars are to make the alterations and erasures necessary to keep their respective registers correct, with powers in this respect similar to those conferred upon the registrar under the Pharmacy Act, but they are promptly to transmit certified copies of all registrations, alterations and erasures to the registrar of the General Medical Council, and there is also to be a power of appeal from the decisions of the local registrars to this Council. With the assistance indicated the registrar of the Medical Council is to compile and keep a general register, to be called a "Register of Dentists," copies of which are to be printed and sold in the month of January in every year.

Other clauses of the Bill deal with the arrangements for conducting the examinations by the Royal College of Surgeons of England, Scotland, and Ireland, and the Faculty of Physicians and Surgeons in Glasgow, under the general supervision of the Medical Council, with a final reference to the Privy Council. One clause provides for the exemption of registered dentists from service upon juries, in corporate or parochial offices, or in the militia.

THE CATALOGUE OF THE MUSEUM.

As will be seen by a statement upon another page, the Council has decided that a copy of the Catalogue of the Collections in the Society's Museum shall be supplied gratis to each Member and Associate in Business who makes application for one to the Secretary.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, February 6, 1878.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Gostling, Greenish, Hampson, Hanbury, Hills, Owen, Rimmington, Robbins, Sandford, Schacht and Shaw.

The minutes of the previous meeting were read and confirmed.

Mr. HAMPSON asked leave to put a question, with regard to the report of the proceedings of the last Council meeting. If he remembered rightly, the Council was in Committee when a communication from the Solicitor of the Apothecaries' Company was read, and it was clearly understood that no report should be made of what took place. He was therefore astonished to find not only a statement of what had taken place, giving the views of the Apothecaries' Company, but also a paragraph in the *résumé* of the year, by the editor, dealing with the same subject. He was much disappointed at this, which he thought showed a weakness in the system of reporting. It was evident that either there was some error in the filtration of the report, and that some foreign matter had crept in, or some one had injudiciously broken the medium of filtration. He thought it very undesirable when the Council was in Committee that its proceedings should be reported.

The PRESIDENT was very sorry Mr. Hampson had raised this question, but he must say he (the President) was entirely responsible for what had taken place. The report, as it came from the reporter, contained no allusion to the business before the Committee, but he thought it so outrageous a thing to send out a professed report of the meeting of the Council, and leave out all allusion to the most important matter which had come before it, that he took upon himself, though not without consultation with others, to insert the paragraph now complained of. He did not consider, although the Council was in Committee, that it followed the business before the Committee could not be mentioned, or a statement made of what the Council was doing. The question was a most interesting one to all the trade, and he did not think the report of the Council meeting ought to have gone forth containing no reference to it. He did not consider the paragraph inserted was any breach of confidence, and he was astonished to find that gentlemen who generally were in favour of the utmost publicity should take exception to what he considered a step in the right direction, for he, personally, should like the reports of the Council meetings to be much fuller than they usually were.

Mr. HAMPSON said the President's explanation was very clear, but he altogether took exception to any person amending the report.

The PRESIDENT said he could hardly be considered in his official capacity "any person." He considered it his duty, when he found a report to be inaccurate to set it right.

Mr. HAMPSON begged to call the attention of the President to the fact that there was a discussion as to whether any report should appear, and it was distinctly understood by the Council that for the present the information should remain with themselves. He thought it a mistake to publish that report for this special reason, that if any report were given the means by which the Council had arrived at that position should also be stated.

The PRESIDENT said anything like a detailed report would have been a breach of privilege, but he did not consider any had been committed.

Mr. SANDFORD could not help thinking that Mr. Hampson had rather over-stated the understanding, for there was no resolution of the Council not to publish anything with regard to the interview referred to. The Council was in Committee, and of course the proceedings could not be reported, but the real question considered, and decided in the negative, was whether Mr. Upton's letter should be published, and he remembered that at the close of the meeting Mr. Hampson requested to have a copy of it, to communicate to the Chemists and Druggists' Trade Association. The objection to that was that the Council could not, having agreed not to publish the letter, give a copy of it for the use of another society, but it was distinctly understood that there would be no objection whatever to any member of the Council giving a summary of that letter to his friends outside. He therefore thought the President had done quite right.

The VICE-PRESIDENT said a certain amount of discretion ought to be placed in the hands of the President. At the same time he could not lose sight of the fact that it was thought undesirable to publish the communication, inasmuch as it was scarcely official, being only a report of a Committee.

Mr. BETTY thought, with all due respect to the President, that it was unfortunate that this notice of the Council proceedings had been published in the semi-official way in which it had been done. There was no need for the members of the Council to exculpate themselves before their constituents, since no accusation had been made against them, and he thought the matter might have stood over for another month, when they could have stated what the letter actually contained. It was a precedent which he hoped would be followed with great caution. He did not quite agree that the main point of discussion was whether Mr. Upton's letter should be published, his impression being that the question was whether the proceedings should be published at all.

The PRESIDENT said he had done what he did with due deliberation, and he should certainly do the same again.

Mr. SCHACHT not having been present at the last meeting was not in a position to argue the whole matter, but he must say that at the December meeting, although the proceedings were in Committee there was a distinct resolution carried that there should be a notice in the report conveying to the outside world that this subject was being thoroughly handled by the Council. He could not help thinking therefore that the President was acting in accordance with the spirit of the resolution passed in December.

Mr. SHAW agreed with Mr. Schacht, and could not see any substantial difference between the report of the December meeting and that of the January. He thought some discretion should be left with the President in such matters.

Mr. HILLS felt much obliged to the President, who had acted, in his opinion, quite correctly.

Mr. BOTTLE also said he felt much indebted to the President for having conveyed the information. Not having been present at the last meeting, he should have been much disappointed if he had not seen that the subject had been receiving attention. He was utterly at a loss to see how members of Council could reconcile to themselves the privilege of taking away memoranda for the use of other societies, and yet say that the members of this Society were not to know what was going on.

Mr. OWEN agreed with Mr. Bottle.

Mr. ROBBINS also approved of the report which had been issued.

Mr. GOSTLING thought the paragraph was perfectly in harmony with the resolution come to at the previous meeting.

Mr. ATKINS had no doubt that if the President required a vote of confidence, it would be cheerfully passed. It was very desirable that those who could not attend the Board should see as full a report of the proceedings as possible.

Mr. HAMPSON wished to explain that any information he had ever obtained was always considered to be given, and was always used, confidentially, and he did not see therefore that the remarks which had been made were at all called for. He disavowed any personal feeling in the matter, and was anxious to have the best possible report of the proceedings, but he thought it should come from the reporter and not from the President.

The PRESIDENT said he could not quite take that view.

The subject then dropped.

MEMBERS OF COUNCIL WHO RETIRE.

The lot being taken in the usual manner for the seven members of the Council who should retire in May next, the following names were drawn :—

Atherton	Gostling	Hampson
Betty	Greenish	Williams
Brown		

The following who remained in by lot last year now retire by rotation :—

Atkins	Owen	Savage
Hills	Sandford	Schacht
Mackay		

The following remain in office for another year :—

Bottle	Hanbury	Robbins
Churchill	Rimmington	Shaw
Cracknell		

ELECTIONS.

MEMBERS.

Chemists and Druggists.

Brownridge, Peter Fallows......Openshaw.
Eagle, John ....London.
Van, Frederick W. Stephen ...Barking.

ASSOCIATES IN BUSINESS.

The following having passed their respective examinations, being in business on their own account and having tendered their subscriptions for the current year were elected "Associates in Business" of the Society.

Minor.

Allis, William ....Alford.
Baker, Matthias ....Nuneaton.
Bate, Joseph William ....Walsall.
Cumine, Rupert Henry ....Farningham.
Davies, Thomas Morris ....Rhyl.
Evans, Richard.......................Liverpool.
Lakeman, Jasper James ....Leytonstone.
Lakeman, Stephen ....Chertsey.
Loggin, Chas. Frederick, jun.Stratford-upon-Avon.
Marshall, George Thomas ... ..Morpeth.
Peacock, Percy... ....Poplar.
Schofield, Frederick Elston......Morpeth.
Shepherd, John William.........Settle.
Smith, Arthur John.......... ...Taunton.
Strawson, George ....Bishop's Castle.
Walker, George ....Dewsbury.
Yates, Ebenezer ....Swinton.

Modified.

Brodie, Robert ....Glasgow.
Chapman, Henry ....Scarborough.
Holmes, Frederick George ......Brill.
Macfarlane, James ....Glasgow.

ASSOCIATES.

The following having passed their respective examinations and tendered their subscriptions for the current year were elected "Associates" of the Society:—

Minor.

Austin, Josiah ....Birmingham.
Bathe, William.......................Chippenham.
Bowden, Thomas Lemon ......Barnstaple.
Eardley, James Furnival ......Manchester.
Heywood, John Henry ....Lincoln.
Johnson, Samuel ....Barnard Castle.
Lacey, James ....Clifton.
Lister, Charles Edward ....Manchester.

Mayne, James ....Chertsey.
Nichols, Arthur Fitzroy ....Leicester.
Parris, Walter ....Bathgate.
Peacock, John Rutherford ... ..Glasgow.
Story, George Arthur ....Bourne.
Tritton, Charles Edmund ......Bristol.
Ward, John Septibo..............Stamford.

Modified.

Bartleet, John ....Shirley.
Sibthorp, Stephen Jas. KennethGlasgow.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary Examination and tendered their subscriptions for the current year were elected "Apprentices or Students" of the Society:—

Adams, Thomas Edwin, jun. ...Liverpool.
Agar, Ralph ....West Hartlepool.
Arthur, Samuel ....Redruth.
Bake, Arthur John ....Birkenhead.
Bartlett, Samuel ....London.
Bayley, Joseph Benjamin ......Birmingham.
Bennett, Joseph John ....Southsea.
Callaway, George Frederic......Ipswich.
Cheal, Harry Alexander...... ..London.
Clark, Edward John ....Swansea.
Collett, Thomas William.........Ingatestone.
Connochie, William, jun. ..... Selkirk.
Cook, John Webster ....Chapel en le Frith.
Count, Sydney ....Colchester.
Cresswell, Henry Peter ....London.
Davidson, Peter ....Insch.
Davies, John.........................Haverfordwest.
Davies, Richard ....London.
Davies, Thomas ....Bridgend.
Dawson, George Robert ....Southend.
Diamond, Harry Scott ....Pembroke Dock.
Donald, Joseph......................Newton Arlosh.
Doo, James Emile . ...Atherstone.
Evans, John ....London.
Eyre, Frederic James ....Ilfracombe.
French, Herman ....Milton, Gravesend.
Gatward, Oswald ....Hitchin.
Goodwin, Alfred Herbert ....Macclesfield.
Gordon, Frederick William ...York.
Hart, William ....Bolton.
Hay, Henry Scott ....Aberdeen.
Hedley, Robert Cecil .... Newcastle-on-Tyne.
Hornby, Alfred........................London.
Johns, John ....Llandilo.
Jones, Henry Stevens, jun. ...London.
Kemp, James ....Aberdeen.
Kirk, William Peele ....Retford.
Knowles, Edwin ....Bolton.
Lapthorn, George...................Taunton.
Leigh, Marshall ....Middlesborough.
Lewis, Llewellyn ....Neath.
Low, Robert ....Norwich.
Lyons, Wilkie Cuthbert ....Monmouth.
McDerment, James ....Ayr.
Marshall, Joseph Jewison ......Beverley.
Martin, John Gibson ....Barnard Castle.
Matthews, Herbert Rouse ......London.
Meadowcroft, James ....Bury.
Morecroft, George ....Knutsford.
Morison, John ....Edinburgh.
Morris, Henry William George Oxford.
Nicholson, Thomas Goddard ...Diss.
Noble, Henry Edward............Peterborough.
Plattin, Henry Ramm............Fakenham.
Prentice, Frank ....Ipswich.
Prosser, Frank Henry............Birmingham.
Quiller, Charles Turner ....Kingston-on-Thames
Richardson, John Richard ....Leeds.
Roberts, Edmund..................Upper Norwood.
Roberts, Hugh ....Liverpool.
Rutherford, Frederick A. R. ...Bristol.
Sanders, Henry John ....Landport.
Scupham, Herbert ....Ulceby.
Sheehan, William..................Royston.
Sherwin, Frederic..................Bakewell.
Shuttlewood, W. Brewin.........Leicester.
Slater, William.....................Romsey.
Smith, Alfred ....Birmingham.
Smith, Thomas ....Wellingborough.
Tait, Robert ....Edinburgh.
Taylor, William ....Birmingham.
Tibbits, James Reginald.........Rugeley.
Tunley, William ....West Bromwich.
Waites, Richard Foulstone......Rotherham.
Walker, Charles ....Birstwith.
Wall, Edward John...............Peckham.
Wiggin, John Chinery ....Ipswich.
Wilding, George James ....Preston.
Wimpenny, John McMillan ...Waterloo.
Young, Edward Herbert... .....Tring.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

The name of Robert Jones, of 3, Turf Square, Carnarvon, was restored to the Register of Chemists and Druggists.

The REGISTRAR presented the report of the state of the Society, and drew attention to the decrease in the number of members, both pharmaceutical chemists and chemists and druggists. This report is printed on pages 630 and 631.

The VICE PRESIDENT said great thanks were due to the Registrar for the able and clear manner in which he had presented the figures. He could not help noticing the contrast between the percentage of failures in the Minor examination in England and that in Scotland, being 48 per cent. in England and only 25 in Scotland.

Mr. HILLS asked if the Secretary could say how many of the chemists and druggists on the register had passed an examination. The total number was 11,013.

The SECRETARY could not give the exact figures, but the numbers were about 3400 examined and nearly 7800 not examined.

Mr. GREENISH wished to draw attention to the point already alluded to by the Vice-President. In the Major examination the percentage of failures was 46·8 in England and 25·0 in Scotland; in the Minor, 48·19 in England, 25·53 in Scotland; in the Modified they were very nearly alike. This seemed to show that there must be very important differences in the examinations. He had on more than one occasion requested that the Council should have a report from the examiners stating in what subjects young men were most generally deficient. There was probably one or more subjects in which the majority failed; he believed it was botany. No doubt the information could be got from the office, but it would not be so satisfactory as if it came from the examiners, because many candidates were sent away for having failed hopelessly in one or two subjects.

The PRESIDENT reminded the Council that it had agreed to send a deputation from the Board of Examiners to attend the examination at Edinburgh this month. The member of that deputation would no doubt consult with their colleagues as to the reason for this large discrepancy, and arrive at some understanding.

Mr. HAMPSON said the Council was responsible for the examinations, and he thought it could scarcely allow statistics of this character to pass without observation. There was a marked difference in the percentage of failures; it might be that the Scotch Board was not strict enough, or that the English Board was too strict;

but whichever it was there ought to be a greater similarity in the average attained.

PRELIMINARY EXAMINATION.

Mr. GREENISH wished to draw attention to the last Preliminary examination, where 192 failed out of 313. The questions were very simple, and he could not help thinking that a lad taken from one of the national schools would answer the questions in arithmetic in the January examination paper, but he understood that this was a subject in which a very large number of failures took place. It appeared to show that middle class education was grossly deficient. He had mentioned to the Secretary his intention to refer to this question, and he would now ask whether any information could be given as to the number of cases under each subject in which the unsuccessful candidates failed to obtain the requisite number of marks at the Preliminary examination held last month.

The SECRETARY said he had ascertained the following details with regard to the Preliminary examination:—The total number of failures was 192; in Latin 41 failed to obtain the pass number; in arithmetic 167 failed; and in English 101. It was to be remarked that of the 167 who failed to obtain the pass number in arithmetic 23 did not obtain a single mark in that subject.

The PRESIDENT added that the answers which came from the north were more deficient in regard to arithmetic than those which came from the south.

Mr. GREENISH asked if the same details could not be given with regard to the other examinations as were given in the case of the Preliminary.

The PRESIDENT said it was a very different thing with the other examinations, and it could not be done unless the examiners could be compelled to test each candidate in all subjects and find out where he failed, whereas the practice was that where a man failed hopelessly in one subject in examination was not further proceeded with.

Mr. OWEN thought that was hardly fair, as young men were nervous when they first came forward, and they became more self possessed afterwards.

Mr. SHAW wished to ask what proportion of those who passed the Major examination had become united with the Society during the past year. This was important, seeing that the Council and the Board of Examiners must in future be composed of pharmaceutical chemists.

The PRESIDENT said, during the past year 53 had passed the Major examination and 56 members had been elected.

Mr. SHAW said in 1875 there were 1248 examined pharmaceutical chemists members; in 1876, 1281; being an increase of 33. He wished to know what was the increase during the past year.

The PRESIDENT said when a member was elected no inquiry was made as to whether he had passed this examination during the same year.

Mr. ATKINS was glad the question had been asked with regard to the Preliminary examinations, and suggested that the weak points might be published. The Council wanted to be able to inform the educating body what were the special points in which failure took place. As a member of the local committee for the university local examinations, he might say that at Salisbury they had made a great point of getting at that information, and found that in the case of girls especially the weak point was arithmetic. One of the examiners, however, a fellow of a college at Cambridge, had most generously endeavoured to repair that special weakness by giving instruction in one or two schools in arithmetic, and at the last examination those schools which he had assisted passed a large number of girls successfully in this subject. Another remark to be made was that 23 candidates had failed to obtain any marks whatever in arithmetic. Now he had frequently found, as a superintendent, that a young man would select out of his subjects those he knew something about and reserve the others till the last, and would sometimes actually drive himself up to the last moment and have no time left in which to deal with them. He always cautioned candidates before beginning to look at the work to see how many subjects there were and how long it would take them to do each. On the last occasion on which he gave that advice he found that at five minutes before the expiration of the time allowed one candidate had not done a single line of his English essay. Whether the candidate failed to pass on that account he could not, of course, say. He believed a great many failed in arithmetic because they presented themselves at, perhaps, the age of nineteen, when they had forgotten the technicalities which were familiar to them on leaving school.

The PRESIDENT said a great deal depended on the superintendents, and if they paid more attention to their duties no doubt the examinations would go on much better.

Mr. SCHACHT said the observations of Mr. Atkins showed what difficulties surrounded this subject. Mr. Greenish had said that this large number of failures pointed to an imperfect system of middle class education, but he could not help thinking that although chemists and druggists desired to get their apprentices from the middle classes, in very many instances apprentices were obtained from a lower class. He knew of cases where boys who almost might be called charity boys were introduced into the business, and, of course, such attempts must result in failure. He had always felt greatly interested in these examinations, and might mention in reference to a suggestion he had heard that copying might take place, that such an idea must be very cautiously admitted from an apparent similarity of answers. He well remembered a lot of papers being put into his own hands when it was supposed that the candidates must have copied from one another, as the same phrase occurred in a great many papers; but he happened to know that it was not so; that it was simply the result of a favourite phrase of the teacher, which had impressed itself on the minds of several of the candidates, and the same words were used in many of the papers because one of the questions happened to touch upon a subject about which the teacher had used his favourite phrase.

Mr. CRACKNELL said he was surprised at the result of the last examination, especially as the questions on the whole were easier than they were formerly. It only showed the necessity for the Preliminary examination. He should like to know something about the age of the candidates, and whether they were apprenticed.

The SECRETARY said they were mostly young men; he thought the average age would be about seventeen. He could not say whether they were apprentices or not.

Mr. CRACKNELL said it would be very desirable if the Council could prevent apprentices being taken until they had passed the Preliminary examination.

Mr. RIMMINGTON could quite confirm the complaints Mr. Schacht had made about apprentices being taken from the lower stratum of the middle class. In all large towns there were a great number of small chemists who were unable to pay assistants or to get apprentices from the respectable middle class, consequently they took youths who were both unfitted for the business and imperfectly educated, and they had to cram up as well as they could to try and get through the examinations. He did not see how the Council could remedy this, because it could not say a man should not take an apprentice if his parents were willing.

Mr. ATKINS was very glad this matter had been mentioned. There were no doubt a number of lads being apprenticed whom it was positively cruel to introduce into the business considering the examinations which had to be passed. He believed it arose in great measure from

REGISTRAR'S REPORT.

MEMBERS, ASSOCIATES, AND APPRENTICES OF THE SOCIETY FOR THE YEAR 1877.

	Life Members.		Subscribing Members.		Associates in Business.	Associates not in Business.	Apprentices.
	Pharmaceutical Chemists.	Chemists and Druggists.	Pharmaceutical Chemists.	Chemists and Druggists.			
Number in 1876	251	3	1811	836	706	...	..
„ restored, 1877 ...	...	..	5	2	3	...	...
„ elected, 1877 ...	1	...	56	23	159	..	...
	252	3	1972	861	868	...	...
Deaths, secessions, etc. ...	5	1	84	34	54	...	...
Total strength of the Society	**247**	**2**	**1788**	**827**	**814**	**832**	**1054**
Summary:—							
1876	251	3	1811	836	706	814	934
1877	247	2	1788	827	814	832	1054
Increase	...	...	...	...	108	18	120
Decrease	4	1	23	9	...	...	...

COMPARATIVE STATEMENT OF THE NUMERICAL STRENGTH OF THE SOCIETY FOR 5 YEARS: 1873-77.

MEMBERS.—PHARMACEUTICAL CHEMISTS.

	1873	1874	1875	1876	1877
Restored to Membership ...	8	1	7	6	5
Elected „ ...	143	55	53	64	56
(Total additions) ...	151	56	60	70	61
Deaths, Secessions, etc. ...	69	72	69	82	84
Increase ...	82	...	...	...	...
Decrease ...	...	16	9	12	23
Total number of Subscribing Members	**1848**	**1832**	**1823**	**1811**	**1788**

MEMBERS.—CHEMISTS AND DRUGGISTS.

	1873	1874	1875	1876	1877
Restored to Membership ...	2	4	3	1	2
Elected „ ...	54	53	50	36	23
(Total additions) ...	56	57	53	37	25
Deaths, Secessions, etc. ...	27	24	29	36	34
Increase ...	29	33	24	1	...
Decrease ...	...	...	...	...	9
Total number of Subscribing Members	**778**	**811**	**835**	**836**	**827**

ASSOCIATES IN BUSINESS.

	1873	1874	1875	1876	1877
Restored	...	1	...	2	3
Elected	141	110	148	160	159
(Total additions) ...	141	111	148	162	162
Deaths, Secessions, etc. ...	17	23	31	32	54
Increase ...	124	88	117	130	108
Total number of Associates in Business	**371**	**459**	**576**	**706**	**814**

ASSOCIATES NOT IN BUSINESS.

	1873	1874	1875	1876	1877
Increase ...	25	149	54	...	18
Decrease ...	...	...	...	70	...
Total number of Associates not in Business	**681**	**830**	**884**	**814**	**832**

APPRENTICES OR STUDENTS.

	1873	1874	1875	1876	1877
Increase ...	83	68	57	82	120
Total number of Apprentices or Students	**727**	**795**	**852**	**934**	**1054**

LIFE MEMBERS.

	1873.	1874.	1875.	1876.	1877.
Pharmaceutical Chemists	**272**	**269**	**261**	**251**	**247**
Decrease	6	3	8	10	4
Chemists and Druggists	**3**	**3**	**3**	**3**	**2**
Decrease	...	...	...	...	1

ANALYSIS OF EXAMINATIONS FOR THE YEAR 1877.

FIRST OR PRELIMINARY EXAMINATION.

Number of Candidates during the Year.	Number of Successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year	Average Number of Candidates at each Examination.	Average Number of Rejections at each Examination.	Percentage of Rejections.
1083	577	506	4	270·75	126·5	46·72

MAJOR, MINOR, AND MODIFIED EXAMINATIONS.

ENGLAND AND WALES.

Number of days on which the Board met for conducting the Major, Minor, and Modified Examinations... 21
Average attendance of the Members of the Board of Examiners at each Meeting ... ... 11·19

Examinations.	Number of Candidates during the Year.	Number of Successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average Number of Candidates at each Meeting.	Average Number of Rejections at each Meeting.	Percentage of Rejections.
Major	94	50	44	6	15·66	7·33	46·8
Minor	442	229	213	6	73·66	35·5	48·19
Modified	20	11	9	6	3·33	1·5	45·0

SCOTLAND.

Number of days on which the Board met for conducting the Major, Minor, and Modified Examinations... 9
Average attendance of the Members of the Board of Examiners at each Meeting ... ... 6·88

Examinations.	Number of Candidates during the Year.	Number of Successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average Number of Candidates at each Meeting.	Average Number of Rejections at each Meeting.	Percentage of Rejections.
Major	4	3	1	2	2	·5	25·0
Minor	94	70	24	5	18·8	4·8	25·53
Modified	8	4	4	5	1·6	·8	50·0

THE REGISTERS OF PHARMACEUTICAL CHEMISTS AND CHEMISTS AND DRUGGISTS, 1877.

Additions during the year:—	
Number of persons who have passed the Modified Examination	15
Minor „	299
Major „ 53*	
Number of persons registered on payment of the Registration Fee, having been in business before August 1, 1868........	34
Number of persons restored to the Register on payment of a fine	22
Placed on the Register by virtue of restoration to membership—Pharmaceutical Chemists	3
An Associate of the Society before July 1842, restored	1
An Associate of the Society before July 1842, restored and elected a Member—Pharmaceutical Chemist	1
	375

* These having already been included in the number who passed the Minor, do not increase the numbers on the Register.

Erasures during the year:—	
Deaths:—	
Notices from Registrars	173
Other sources	57
Erased at the request of registered persons themselves........	2
Erased by order of the Council	1
Increase of numbers on the Register	**142**
	375

Number of Pharmaceutical Chemists on the Register, December 31st, 1877	2,307	
„ „ Chemists and Druggists	11,013	
		13,320

the custom now growing up of taking outdoor apprentices, because when this was the case the chemist not only took less premium, but the apprentice did not associate with the family, and therefore the master was not so particular as to his social standing. He hoped that would be deprecated as far as possible; at the same time he felt that the mischief lay rather in another direction, that in middle class education they had no test of what results were got for the money spent. Mr. Lowe had introduced the celebrated phrase "payment by results;" but in middle class society there were very large sums paid for education as to which no test whatever was applied.

Mr. Greenish said that Mr. Schacht's remarks were no doubt important, but he must draw attention to the fact that so few failed in Latin, and comparatively few in English, whilst the great number of failures occurred in arithmetic. This went to show that the young men could not have been taken from what was called the lower stratum of society.

The President reminded Mr. Atkins that in Scotland and the North it was the almost universal practice to take outdoor apprentices, so that it would not do for the Council to attempt in any way to interfere with that practice.

Mr. Hampson said it was currently discussed, and to a certain extent credited, that the examinations held in England were too strict, and that the questions asked were sometimes of a rather extraordinary kind. He hoped therefore that the members of the deputation from the examiners in their conference with their Scottish brethren would come to something like a fair understanding on this matter.

Mr. Hills said he believed there was about the same percentage of failures in the Preliminary examinations for the College of Surgeons and for the College of Physicians and Apothecaries. Certain remarks had been made as to where the young men came from, but he was rather inclined to think that whatever stratum of society a young man came from he might make himself a gentleman and take any position. It was important that he should pass the Preliminary examination before he entered the business. If he did so, and then complied with the other regulations, he was eligible to be become President of the Society, or attain any other position.

Reports of Committees.

Finance.

The report of this Committee was read and adopted, and various accounts ordered to be paid.

Benevolent Fund.

The report of this Committee included a recommendation of the following grants :—

£15 to the widow, aged 60, of a pharmaceutical chemist, and formerly a local secretary.

£15 to the widow, aged 57, of a member.

£10 to a registered chemist and druggist, aged 68, suffering from incurable disease. Applicant had received two previous grants of £10 and £5 respectively.

£10 to the daughter of a chemist who has had ten previous grants of like amount.

£10 to a former member, in reduced circumstances to enable him to apprentice his son.

Several other cases had been before the Committee, but their further consideration had been deferred for more complete information, and in one instance the Committee had declined to recommend any grant.

The report and recommendations of the Committee were unanimously adopted.

The Secretary presented the following statement, showing the amount of annuities and of temporary assistance given from the Benevolent Fund during the past year, and who were the recipients; also a table showing the number of subscribers and donors to the Fund, and the amount contributed by each :—

BENEVOLENT FUND, 1877.

Temporary Aid Granted.

	No.	Amount.	Total of each Class. No.	Total of each Class. Amount.	Total. No.	Total. Amount.
		£ s. d.		£ s. d.		£ s. d.
Annuities.					29	**675 0 0**
Temporary Aid: *Connected or who had been connected with the Society*:—						
Members and Associates........	7	95 0 0				
Widows and an Orphan........	12	165 0 0				
To provide homes for Orphan Children	3	131 5 0	22	391 5 0		
Not connected with the Society:—						
Registered Chemists & Druggists	9	95 0 0				
Widows..........	7	100 0 0				
To provide a home for an Orphan Child..........	1	52 10 0	17	247 10 0	**39**	**638 15 0**
						1313 15 0

Analysis of Contributions.

Subscribers or Donors of	Subscriptions. No.	Subscriptions. Amount.	Donations. No.	Donations. Amount.
£ s. d.		£ s. d.		£ s. d.
0 2 6	156	19 10 0	..	- - -
0 5 0	768	192 0 0	..	- - -
0 10 0	63	31 10 0	..	- - -
0 10 6	794	416 17 0	..	- - -
1 0 0	5	5 0 0	..	- - -
1 1 0	312	327 12 0	5	5 5 0
2 2 0	32	67 4 0	..	- - -
3 3 0	1	3 3 0	1	3 3 0
3 6 0	..	- - -	1	3 6 0
5 5 0	2	10 10 0	3	15 15 0
10 17 0	..	- - -	1	10 17 0
21 0 0	1	21 0 0	..	- - -
52 10 0	..	- - -	1	52 10 0
Odd Amounts	30	10 19 4	14	5 18 6
	2163	1105 5 4	26	96 14 6

Number of persons on the Register of Chemists and Druggists (1878)	13320	
Number of persons who subscribe to the Fund	2189	
Total number of persons who do not subscribe		**11131**

A Proposed Grant to the Benevolent Fund.

Mr. Sandford then moved the resolution of which he had given notice :—

"That the sum of £500 be transferred from the General Fund to the Benevolent Fund."

He said it was some years since the Council had granted anything to the Benevolent Fund. Two months ago when £2000 was invested, he was told by some friends that the Council had no business to accumulate money, and he thought it could not do better than give £500 to the Benevolent Fund; all members and associates had the right of voting for annuitants, and therefore the Society should contribute to the maintenance of the Fund. When he first proposed this in December, Mr. Hills had promised to second the motion, but had now withdrawn, and he therefore asked if any other member of Council would second it.

Mr. Gostling said he would second the motion, as he thought it very important that the permanent fund for benevolent purposes should be increased without trenching on the annual subscriptions.

Mr. Betty suggested that any discussion on this motion should take place in Committee.

Mr. Hanbury thought it was a very important question and not desirable to be publicly discussed in the first instance. If there were any pressure on the Benevolent Fund, or inability to pay the annuitants he should then think it proper to make such a grant, but when the Fund was flourishing the proposal to transfer a large sum from the funds of the Society to the Benevolent Fund was a matter which took him by surprise, and, under the circumstances, he thought the Council would do well not to publish the discussion which might take place upon the question.

Mr. Hills thought it would be well to go into Committee on the matter.

Mr. Hampson asked for the reasons for so doing.

Mr. Betty having stated shortly the reasons why he thought it desirable to do so,

Mr. Hampson said he thought if the Council could not discuss a question on the Benevolent Fund without going into Committee things had come to a very strange pass. He thought the Benevolent Fund would stand fair discussion, and that it would be to their advantage that the members of Council should speak with such deliberation as would be necessary if they spoke openly.

The question of going into Committee was then put to the vote, and it was decided by a majority of one that the discussion should take place openly.

Mr. Bottle said he had already asked Mr. Sandford to withdraw the motion. The return now put into their hands showed that of 13,320 chemists and druggists on the Register 2189 only subscribed to the Benevolent Fund. The Secretary had just sent out a petition on behalf of the Fund, and he would ask Mr. Sandford, if he did not entirely drop this proposition to, at any rate, defer it to a later period of the year.

The Secretary said he had already received several satisfactory returns to the circular.

Mr. Robbins also feared that if this amount were given to increase the funded capital it would have a tendency to lessen the subscriptions. He would much rather keep the £500 in hand, and if the Fund at any time required it he would vote it willingly. At present the money could be used for any purpose to benefit the Society, but if once it were drafted to the Benevolent Fund it was tied up, and could be used for that one purpose only.

Mr. Hampson said he should like to satisfy himself that it was a right thing to vote £500, subscribed by members and associates, for the benefit of all chemists and druggists as well as members.

Mr. Bottle said that was quite within the power of the Council by the Act of Parliament.

Mr. Hampson thought it would be wise to withdraw the motion for the present. The Fund was not languishing, and there was every prospect that members would subscribe in the future perhaps more than in the past.

Mr. Betty appealed to Mr. Sandford not only to withdraw his motion, but not to bring it forward again. He could not help thinking that in the present state of things the Benevolent Fund was suffering from too many doctors. Two or three years ago the members of the Council had "Dr." Robbins telling the Committee that the administration of the Fund had been very injudicious from the beginning, because it had been too timid in the distribution, that it accumulated money to save the pockets of posterity. This view had been adopted by the Council; it had relied on the active benevolence of those whom it concerned; this was its guiding principle. Now a second "doctor" came forward and wished them to reverse that policy and supplement the Fund with this fictitious aid from the moneys of a public institution. One or other of these principles must be wrong. The evil would not be so much in tying up the £500 as in departing from those accepted principles of liberality and charity which were now relied upon. He must be a bold man who would jeopardize the present successful mode of carrying on the Society's benevolent operations, but if it were known that the Council entertained the idea of voting large sums of money it would remove a great incentive to charity. The Fund would be looked upon as independent of popular aid; it would be thought there was a certain power at its back to aid it in case of emergency, and this would not at all contribute to its successful operation.

Mr. Sandford said he could not accede to either of the requests which had been made. When Mr. Betty talked about a new system, he thought he could hardly remember what had taken place before, because the charter plainly stated that one of the objects of the Society was to provide a fund for the relief of distressed members, their widows and orphans.

Mr. Hampson said it did not say anything about chemists and druggists outside the Society.

Mr. Sandford said that was subsequently added by the Act of 1868, when the Council got power to relieve men who were not actually connected with the Society, and this had been a great benefit to many who were not members. He believed every one there had felt a pleasure in administering relief to those who needed, although they had not subscribed to the Society. It was not a fictitious grant in any way, and as far as the prosperity of the Fund was concerned, it always struck him that people liked to subscribe to a rich fund rather than a poor one. The Council was now voting large sums in relief, £60 that morning, and therefore funds were required. He had always held there should be enough invested capital to furnish sufficient money to pay the annuitants. He should be sorry, however, to raise any discussion which would be injurious to the Fund, and therefore he hoped the question would be put to the vote.

Mr. Betty was quite aware the Council had voted money before, but it was under totally different circumstances.

Mr. Owen hoped the members present would oppose the vote. The Benevolent Fund had never been in such a flourishing state, and therefore it would be wiser to trust to the generosity of members of the trade.

The President said he should be sorry to oppose aiding the Benevolent Fund if he thought such assistance was wise, but on this occasion he was of a different opinion. There was no doubt the Council had power to make a grant to the Benevolent Fund if it were necessary, and the time might come when it would be wise to do so, though he hoped it would not. The Fund ought to be self-supporting.

Mr. Atkins joined in the appeal to Mr. Sandford to withdraw the motion for the present. He thought the Council ought to look forward some day to the Society having premises of its own, for which a large accumulated capital would be required.

Mr. Sandford having referred to the passages in the Charter and the Act of 1868 which authorized the proposed course, a vote was taken upon the motion with the following result:—

For—Messrs. Churchill, Gostling, and Sandford.

Against—Messrs. Atkins, Betty, Bottle, Cracknell, Greenish, Hills, Hanbury, Hampson, Owen, Rimmington, Robbins, Schacht, Shaw, Savage and Williams.

The Casual Fund.

The Vice-President then moved, pursuant to notice—

"That the sum of £20 from the Benevolent Fund be placed in the hands of the Secretary for the relief of such temporary pressing claims as he may think desirable, and that he be required to produce a statement to the Committee of its disbursement."

He said it was well known that the Secretary had small amounts placed at his disposal by private members for the purpose of rendering assistance to those who were in immediate want. It occurred to him that it would be very desirable that such a sum as he proposed should be in his hands which might help to prevent the President and other members being imposed upon, as the Secretary would be more likely to take pains in inquiring into the character of applicants than private persons who had not the time or opportunity to do so.

The PRESIDENT said the subject had been discussed in Committee, and it had been considered that some small sum should be placed in the Secretary's hands from the Benevolent Fund.

Mr. SHAW raised the question of the legality of this proceeding. He understood that the Secretary gave from this casual relief fund assistance to persons who were precluded by the regulations from obtaining assistance from the Benevolent Fund direct. It appeared to him rather irregular that money should be taken from the Benevolent Fund and handed to a second party to do that which the Committee had not apparently power to do. He thought it would be more legitimate to give the money from the General Fund.

Mr. OWEN thought it very desirable that the motion should be carried.

Mr. ATKINS thought if the Council could not do this it was very absurd. The Benevolent Fund did not exist for chronic cases only.

Mr HAMPSON suggested the matter should be referred to the Committee.

Mr. GREENISH said it had been already considered by the Committee, which was unanimous in its favour.

The motion was then put to the vote, and carried unanimously.

COUNTER PRACTICE.

The Council then went into Committee to receive a communication from the Solicitor with regard to his communications with the Society of Apothecaries, and it was afterwards resolved that the following correspondence be published:—

"20, Austin Friars, London,
"1st January, 1878.

"Dear Sir,

"I placed the subject of our discussion before the Act of Parliament Committee of my Society.

"It was their intention to have referred the decision of that Committee to the full Court of the Society, which sat the same day at a later hour, but the Court was so much occupied with other business that the decision of the Act of Parliament Committee could not be brought before them.

"The communication therefore which I make to you has not that official sanction which it would have if it were a resolution of the Court of the Society, instead of the decision of a Committee formed out of that Court.

"But as that Court is constituted of all the leading members of the Society, I have no reason to doubt but that the decision which they have come to will be accepted without alteration by the Court.

"Their decision was 'That having regard to the statement laid before them by Mr. Upton, this Committee was unable to discover any case where the sanction of the Society had been given to a prosecution on a pure and simple case of counter practice and that while this Committee expresses no opinion as to whether cases of counter practice come within the Act of 1815, or whether the persons prosecuted in respect of such practice are liable to the penalty imposed by that Act (although the decided cases appear to be in favour of such practice being within the Act), it is not desirable that the sanction of the Society should be given to prosecution where counter practice is *alone* involved.'

"I think it right to add that in nearly all cases of prosecutions by the Society, there is a double offence alleged to have been committed, viz., visiting and counter practice, and that it is impossible for the Society in giving their sanction to a prosecution to limit it to *one* of the alleged offences.

"If the person who is alleged to be guilty of visiting patients is also guilty of counter practising it is impossible to withdraw the consideration of the latter question from the tribunal before which the case comes.

"Under these circumstances (subject to the official sanction of the Court to which I have above referred), it is unlikely that the Court will accept the suggestion which was made by yourself to me.

"Yours faithfully,
"(Signed) JAMES R. UPTON.

"W. Flux, Esq."

"3, East India Avenue, London,
"2nd January, 1878.

"Dear Sir,

"Referring to your letter of yesterday, will you oblige me with a line saying whether it may be regarded as a formal communication to be used without reserve?

"Or whether I am to regard and use the same to any and what extent as confidential and private?

"Sincerely yours,
"(Signed) WILLIAM FLUX.

"Jas. R. Upton, Esq."

"20, Austin Friars, London,
"2nd January, 1878.

"Dear Sir,

"In reply to your letter there is nothing private in the communication I sent you yesterday.

"Yours faithfully,
"(Signed) JAMES RICHARD UPTON.

"W. Flux, Esq."

3, East India Avenue, London,
"10th January, 1878.

"Jas. R. Upton, Esq., *Solicitor*,
"20, Austin Friars.

"Dear Sir,

"As my clients' Council Meeting took place on on the morning when your esteemed favour dated the 1st inst. arrived, time did not permit of my looking into and reporting fully to the Council upon sundry materials bearing upon the considerations suggested by the letter, therefore I submitted to the Council the letter as received and made a short oral statement that the suggestion of mine to which your concluding sentence referred was to the purport that if your clients really desired to question the legality of counter practice by chemists and druggists the matter should be openly and fairly tried in a test case to be arranged for by your clients on the one hand and my clients on the other, and conducted by the solicitors of the Societies; so that the precise point should be satisfactorily arranged for trial by my finding a respectable chemist and druggist to perform the acts of counter practice which you may think necessary for raising the point to be the subject of decision; and so also that cessation of sundry cases might result. I also mentioned having stated to you that my clients, whilst regarding counter practice as a public and trade necessity protected by the 21st section of the Apothecaries Act, 1815, did not encourage, and had no intention at variance with discouraging its exercise further than unavoidable.

"In Committee of the whole Council, the letters were considered so far as time would permit of and a resolution was passed in words as follows:—

"'That the letters of the 1st and 2nd January instant, received by Mr. Flux from Mr. James Richard Upton, the Solicitor of the Society of Apothecaries, be entered on the minutes. That the consideration of them be proceeded with at the next Council, and that in the meantime Mr. Flux do ask Mr. Upton to inform him when the resolution of the Act of Parliament Committee referred to in the letters has been considered by the Court of the Society, and also to say distinctly whether this Council may feel free to publish the letters in their discretion or to use them in any general meeting of this Society.'

"I feel at liberty to mention that the tenor of the resolution passed by the Act of Parliament Committee of your Society was regarded as satisfactory to a point, but that doubts existed as to whether it was sufficiently conclusive and satisfactory, regard being had to the actual course which the litigation authorized by your Society has taken and appears likely to take if not controlled by you.

"As it appears that the litigation has not been conducted by your Society, but by prosecutors who have obtained the sanction of your Society, on allegations concerning alleged acts, other than counter practice, I have been careful to refer to the printed reports which have appeared of the cases before the Courts, and have not found that the Apothecaries' Society (or rather those representing it) have given evidence of acts outside of the shops of the defendant chemists and druggists.

"To me it appears that whatever may have been the statements upon which parties obtained the sanction of the Apothecaries' Society to proceedings that sanction has been used for the purpose of raising issues as to and only as to counter practice, and I cannot trace materials for advising with confidence that in each and every of the cases now in issue, or in any future case they can rely upon the legality of counter practice not becoming the subject of the issue on which the case will turn.

"It certainly would be more satisfactory to my clients if I could convey to them an assurance that the powers of suing for penalties reposed by statute in the Apothecaries' Company will henceforth be exercised by and only by the Society acting by its own solicitor.

"My clients never have delegated the powers of suing entrusted to them, and the preservation of that good understanding between the Societies which hitherto has prevailed will be less in peril if the practice of your Society in regard to litigation be placed and preserved on a similar footing.

"The next Council of my Society will take place on Wednesday, the 6th February.

"I am, dear sir, yours truly
"(Signed) Wm. Flux."

"20, Austin Friars, London,
"5th February, 1878.

"My dear Sir,

"In reply to your letter of the 10th ult., I am authorized to state that your clients may make any use of my letter to you of the 1st ult., which they may think right to do.

"If you again refer to my letter of the 1st ult., you will I think find that there is really nothing inconsistent between what I there stated and what you say is the result of your perusal of the evidence in various cases to which you have referred.

"I am prepared again to affirm that in the few years during which I have acted as the solicitor to the Society, I have not authorized any prosecution in a case of pure and simple counter practice, and that I shall not do so, so long as I have the honour to hold that office, and I think you may accept this, not only as the course which I should personally pursue, but as the policy of the Society.

"Under these circumstances I must ask you to let the matter rest between us where it is.

"As regards the Society taking upon themselves the conduct of prosecutions, the reasons are so numerous, and (I may almost add) obvious, why they should not do so, that I do not think it necessary to go into this part of the question, but I may add that if they were to do so I am satisfied that the result would be exactly the reverse of what your clients suppose would happen.

"Yours faithfully,
"(Signed) James Richard Upton.

"W. Flux, Esq."

Library, Museum, and Laboratory.

The report of the Committee included the Librarian's report as follows:—Average attendance for the previous month, day, 15; evening, 8. Circulation of books, town, 102; country (20 places), 32; carriage paid 8s. 1½d. Circulation of books for 1877:—No. of entries 2014, being about 1600 in town, and 400 in the country. Total number of attendances during the year, day, 5255; evening, 2050. Highest attendance during the year, day, 37; evening, 25. Average attendance for the year, day, 17; evening, 10. No. of books and pamphlets added during the year, nearly 300. No. now in the library, 5050.

The Committee recommended the purchase of Burbidge's 'Horticulture.'

The following donations to the library were reported:—

'Das Nördlinger Register.'

'Note sur la racine de Violette de Vérone.'

'Notizen über das Saponin der Sarsaparilla.' From Professor Flückiger.

'Year-Book of Pharmacy 1877.' From the British Pharmaceutical Conference.

'Die Herbstzeitlose im Bier.'

'Beiträge zur Kenntniss der Veratrum-Alkaloide, von A. Tobien.' From Professor Dragendorff.

'A Universal Pharmacopœia.' From Dr. E. R. Squibb (author).

'Etude sur les propriétés de la Conicine.' From M. A. Petit (author).

'Chemical Composition of Foods,' etc. From Mr. E. T. Kensington (compiler).

'On the Geology of the Eastern Portion of the Banbury and Cheltenham Direct Railway.' From Mr. T. Beesley (author).

The Curator had reported the average attendance for for the previous month in the Museum as follows:—Day, 13; evening, 4. Also that the specimens of drugs asked for had been sent to Leicester, with a few exceptions, in cases where there were no duplicates. The list of duplicate specimens was in progress.

A letter had been received from the Philadelphia College of Pharmacy saying that in re-arranging the museum, duplicate collections of American drugs were being made, of which lists would be prepared with a view to presenting them to foreign pharmaceutical societies, and that if agreeable a list should be sent to the Pharmaceutical Society of Great Britain; also that should the Society specially desire any drug or preparation of North American origin the Committee would endeavour to procure it.

The Committee had requested the Secretary to write and thank the College for its kind offer, and to state that the Society would gladly accept the proposed presentation of American drugs.

The Professors had attended and reported favourably of their respective classes.

The following special evening lectures were stated to be arranged for—

Wednesday, February 20, Professor Redwood, on "Spectrum Analysis," illustrated with the electric light.

Wednesday, April 17, Professer Bentley, on the "Properties and Uses of the Eucalyptus Globulus.

The Chair to be taken at 8.30 on each occasion.

The report and recommendations of the Committee were received and adopted.

Catalogue of the Museum.

The President drew attention to the catalogue of the Museum which had just been completed. He said he thought it was important that it should be distributed as freely and liberally as possible, and the resolution he had to propose was that a copy be sent to each local secretary, and he would add to all local associations.

Mr. Schacht asked what would be the expense of sending a copy to every member.

The Secretary said this would involve a very heavy expense, and there were not in fact sufficient copies printed.

Mr. SCHACHT said it was one of the most useful things that had emanated from the house for a long time.

The PRESIDENT said it had already been agreed by the Committee to recommend that a copy should be supplied to every member and every associate in business who chose to apply for it. It would probably prove too much trouble to the majority to apply, but he did not think the Society should go to the expense of sending copies unless they were applied for. He would also suggest that learned societies at all concerned in the sciences allied to pharmacy and also public hospitals should have a copy.

Mr. RIMMINGTON thought the President's proposition was quite wide enough. More than half the members would not care about having a copy.

Mr. HAMPSON suggested that editors of medical journals should have copies.

The SECRETARY said they would of course have copies.

Mr. GREENISH proposed that the matter be referred to the Library Committee who should report to the Council at the next meeting. Of course, copies might be sent to local secretaries at once, but he wanted about forty or fifty copies to go to persons who had contributed and were willing to contribute to the museum.

Mr. GOSTLING suggested there should be a prominent announcement on the outer page of the Journal of the proposition that members should have a copy on application.

The motion to send a copy to each local secretary was then agreed to, as was also a vote of thanks to Mr. Holmes, the Curator, for the preparation of the catalogue, and a similar compliment to those members of the Committee who had assisted him.

DEPUTATION TO THE BOARD OF EXAMINERS IN SCOTLAND.

Mr. BOTTLE said that some years ago he accompanied a deputation to Edinburgh when there was some little discrepancy between the results of the examination in England and Scotland, although nothing approaching that shown by the present returns. It now appeared that the percentage of rejections for the Major examination was in England, 46·8; in Scotland, 25; for the Minor, England, 48·19; in Scotland, 25·53; for the Modified it was 45 in London, and 50 in Scotland, being a very near approximation, but he must say the variations in the Major and Minor results literally astonished him. When he visited the Scotch examination some few years ago he could not detect any difference between the examinations in Scotland and those carried on in England, and if there was any difference his impression was that the Scotch Board was really firmer in its determinations than the English. He had been trying to make up his mind as to what was the cause of the difference, and was inclined to believe that those who passed the Preliminary in Scotland were better educated than those who did so in England, and that might be a reason why a larger number of them were more successful in coming up and passing the Minor and Major afterwards. But it was now found that the reverse was the case, so that could not be the explanation. Then it had occurred to him that in Scotland a young man might have shorter hours of work, as many of them were out-door apprentices, and thus they might have more time and opportunity for study; but at any rate it was very important that some greater approximation to uniformity should be made, and he therefore proposed that the President, Mr. Sandford, and two members of the Board of Examiners, with the Assistant Secretary, attend the examination in Edinburgh on the 26th and 27th inst.

Mr. ROBBINS seconded the motion, and hoped the deputation would make a special point of inquiring into this matter.

Mr. BETTY supported the motion although he had not great hopes of a two days' visit being sufficient to enable the deputation to remedy the discrepancy which appeared in the returns.

Mr. SANDFORD hoped that some one would be appointed in place of himself.

Mr. SCHACHT said the object was to assimilate the examinations in England and Scotland, and he therefore suggested whether it would not be better for the deputation to consist exclusively of members of the Board of Examiners. If they could have two of the Scottish members attending a London examination and two London examiners attending the one in Edinburgh, and if that process were continued from time to time, there would grow up a more intimate knowledge of the course adopted by each Board, and he thought that would lead to more practical good than these formal visits of inspection.

Mr. GREENISH suggested that the Curator should attend the deputation.

Mr. BETTY supported the proposal of Mr. Schacht which he thought if carried out would go to the root of the matter, and he hoped at some future time it would be adopted.

Mr. BOTTLE said Mr. Schacht's suggestion was very good, and he quite agreed in it, but the 10th section of the byelaws provided that certain parties should be examiners in England and Wales and others in Scotland, so that he thought there was a practical difficulty in carrying it out.

Mr. BETTY remarked that at the next election they might appoint two Englishmen to the Scottish Board and two Scotchmen to the English Board.

The SECRETARY said that in that case they would only be conversant with the practice of the Board to which they belonged.

After some further discussion the motion was unanimously agreed to.

HOUSE.

The Report of this Committee was read and adopted. It recommended that certain alterations be made to improve the ventilation in Professor Redwood's room.

LAW AND PARLIAMENTARY.

This Committee reported that at its meeting a long letter had been read from Mr. Von Cavania, whose name has lately been removed from the Register, giving details of his business, and stating that he was prepared to prove his title to registration. The Secretary had been requested to write to him, saying that his registration had become invalid, but that any future application he might make, supported by proper evidence, would be considered.

Recovery of a Penalty.

The report of the Solicitor included a statement of the proceedings taken against Mr. William Mackness, of 113, Tottenham Court Road, grocer, for carrying on the business of a chemist and druggist under the style of The London and Provincial Supply Association, he being unregistered. The result was that Mr. Mackness had paid the penalty of £5 and costs. It had also been intimated that the defendant was taking steps to terminate any violation of the law. A letter had since been received saying that Mr. Mackness had sold his business to the "London and Provincial Supply Association, Limited."

The report included details of several other matters connected with infringements of the law.

Weights and Measures.

The following communication had been received:—

"Board of Trade
"(Standards Department),
"22nd January, 1878.

"Sir,

"I have the honour to inform you that the Board of Trade are preparing a Bill to consolidate the laws relating to weights and measures.

"By the Medical Practitioners' Act, 1858, it is provided that the General Council of Medical Education shall cause to be published in the British Pharmacopœia a list of medicines, etc., together 'with the true weights and measures by which they are to be prepared and mixed.'

"The Weights and Measures Act, 1835 (5 and 6 William IV., cap. 63, section 10), provides, however, that drugs may be sold retail by 'apothecaries' weight.'

"The Board of Trade would be glad therefore to be informed whether in the opinion of the Pharmaceutical Society there would be any objection to the repeal of so much of section 10 of the Act of 1835 as relates to 'apothecaries' weight,' as avoirdupois weight appears now to be used in the preparation as well as in the retail sale of drugs. "I have the honour to be, sir,

"Your obedient servant,

"T. H. Farrer.

"The President of the
Pharmaceutical Society of Great Britain."

When the subject was under consideration, Professor Redwood had attended the Committee, and stated that the Medical Council had received a similar communication.

After due consideration the Committee decided that it could not recommend the repeal of the clause referred to, because many drugs are required to be sold in quantities smaller than are represented by any denomination of avoirdupois weight, and in the event of such repeal there would be no other weight than the avoirdupois that could be legally used. A copy of this resolution was directed to be sent to the Medical Council.

Mr. Shaw did not see what difficulty there was in agreeing to the proposal of the Government with respect to weights and measures that the use of the apothecaries' weight should be given up.

The President said the question was not as to the use, but whether the practice of selling things by apothecaries' weight should be made illegal. If a person came in for a drachm or half a drachm of quinine the pharmacist would not be allowed to sell it under that name if this alteration took place.

Mr. Shaw thought the Council should assist the Government in the effort at uniformity in weights and measures. He did not see any difficulty in making use of the avoirdupois weight. It was now adopted and used by the Pharmacopœia Committee.

The President said the Committee had had the privilege of Dr. Redwood's assistance, and it appeared that the Medical Council in authorizing the alteration to avoirdupois weight did it from the idea that it would be consulting the convenience of pharmacists. It reasoned in this way, that when preparations of the Pharmacopœia were written in apothecaries' weight they often had to be calculated by the pharmacist into avoirdupois weight, because he generally wanted to make up a larger quantity than that mentioned; but the Medical Council had no idea of doing away with apothecaries' weight, either in prescribing or dispensing, or its ordinary use for small weights. You could not use an ounce of 437½ grains, and divide it into small quantities. Therefore, although avoirdupois weight was convenient for large quantities it was never supposed by the Medical Council it was going to do away in dispensing with the most convenient system of weights—the apothecaries' weight.

The Vice-President added that if chemists and druggists agreed to this proposal they could not claim payment for any article which they sold by the drachm; it would be illegal. It was very desirable to retain the present weights, and he saw no advantage for getting rid of them.

The report and recommendations of the Committee were then agreed to.

Medical Act Amendment Bill.

Mr. Atkins drew attention to the Medical Act Amendment Bill, recently introduced by Dr. Lush, of which he had seen a rough draft, and was happy to say it contained nothing in it whatever affecting the interests of pharmacists. It was a very short Bill, only dealing with questions of medicine and surgery.

Report of the Board of Examiners.

Report of Preliminary Examination.

January, 1878.

Candidates.		
Examined.	Passed.	Failed.
313	121	192

Certificates received in lieu of examination:—

1 Royal College of Surgeons.
1 College of Preceptors.
3 University of Cambridge.
1 University of Oxford.

The Secretary reported that two candidates at the recent Preliminary examination had been disqualified owing to a report from the College of Preceptors that their papers had evidently been copied one from the other.

Some conversation took place with regard to this matter, and a very strong opinion was expressed as to the neglect of duty on the part of the superintendent in allowing such a thing to take place.

Chemists' Assistants' Association.

A letter was read from this Society asking for the loan of a few materia medica specimens for exhibition at a conversazione to be held this month. The matter was referred to the Library Committee with power to deal with it as it thought right.

PHARMACEUTICAL MEETING.

Wednesday, February 6, 1878.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

The minutes of the previous meeting having been read and confirmed—

Mr. Holmes described several specimens which were exhibited on the table. Among these were some very magnificent crystals which were prepared some years ago by Mr. Copney, and lately presented to the museum. One was a crystal of common alum and chrome alum crystallized together so as to show that they were perfectly isomorphous. There were very fine specimens of Mogador colocynth, which had lately been very rare in the market. The specimen of absolute phenol was presented by Messrs. Bowdler and Bickerdike. He believed the substance had been before the meeting on a former occasion, but he should be very glad to hear from any of the gentlemen present whether it really was deliquescent or not. He had a specimen in his room for some time, and it seemed to cohere. The specimens of monochloride of iodine and trichloride of iodine had been prepared by Mr. W. R. Dunstan, one of the students in the laboratory, but they were of purely chemical interest. The specimen of dragon wood had somewhat of the appearance of sanders wood, but whether it was identical with that substance he could not state. The specimen of oil of rose geranium was of some interest, from having been prepared artificially from one of the andropogon oils. The specimen of salicylic acid and of salicylate of soda, prepared from oil of wintergreen had been presented by the President. The specimen of a stem of *Scorodosma fœtidum* was obtained from a plant which had a very different appearance from the *Narthex Fœtida* plant when growing. The narthex had very large leaf-sheath and numerous branches. This, on the contrary, was almost bare of branches and had very few leaves, and these leaves had not the leaf sheaths. The vittæ of the fruit were also less distinct.

The President read a letter from Mr. Howard, accompanying some specimens of cinchona in flower.

Professor BENTLEY said that there was a specimen of Chinese opium which had been sent by an old student of the School of Pharmacy, Mr. Thirlby, who was now residing at Shanghai. Along with the specimen Mr. Thirlby had sent the capsule of the poppy from which the opium had been extracted. It was known that ordinarily the capsules of the poppy were incised in different ways—both vertically and transversely. This specimen of Chinese opium came from the port of Winchow, which had recently been opened, and was much south of Shanghai. It appeared that in China, instead of the capsules being incised, they were punctured. The juice exuded and was collected in the ordinary way after a day or a day and a half. Mr. Thirlby described the specimen of Chinese opium which he had examined as being very moist. In point of fact, the Chinese simply scraped it from the capsules and put it into jars. The specimen on the table had been subjected to a process of drying, but even the drying was so imperfect that the opium was quite musty. Still, there was a decided opium odour about it. Chinese opium was particularly interesting, because, as might be known by some of the members, opium was now being obtained in various parts of China in large quantities. The amount of morphia obtained from it had been variously estimated, and some reports had been published by the Apothecaries' Company and by others, and he (Professor Bentley) was informed that in some specimens as much as from 15 to 17 per cent. of morphia had been found. The specimen which had been examined by Mr. Thirlby had been found by him to contain 7·75 per cent. of morphia, and 6·75 per cent. of narcotine. The Chinese opium which he (Professor Bentley) had seen, he should say, was altogether inferior to Smyrna opium, although he had heard statements made to the contrary. He would also call attention to some flowers that were upon the table. Mr. Lockwood, of the Bengal Civil Service, who had recently returned from India, had brought home with him a large consignment of these flowers. They were produced by a plant of which there were millions of trees in India. The flowers were called *matura* flowers. They were like fruits on a superficial examination, but were really the corollas of a plant known as *Bassia latifolia*. Mr. Holmes had also obtained some specimens from Mr. Christy. If these flowers were put into water it would be seen that they were flowers and not fruits, for the stamens would be seen inside the corolla. In some parts of India they were very largely used for food, not only by birds and other animals, but also by human beings. They had a decidedly saccharine smell, and contained a large quantity of sugar. It was proposed to use them for the distillation of a kind of spirit very much like whisky. When the spirit obtained from them was new it had much the effect of new rum, and was very injurious, and there appeared to be a difficulty in freeing the spirit from its disagreeable qualities; but when it was old it got better. Several tons of the flowers were coming into the English market to be used in distillation.

Dr. DE VRIJ objected to the use of the term "artificial oil of geranium" to designate an oil which was not in reality an oil of geranium, but was obtained from a species of *Andropogon*. He said that the use of such a term would cause great confusion.

Mr. UMNEY said that he should be glad to learn by what process the artificial specimens on the table had been prepared.

The PRESIDENT said that they would not suppose an artificial oil to be a thing produced by nature at all, but they would understand that the word "artificial" indicated that the oil was produced by chemical means.

Professor BENTLEY said that "oil of geranium" was a term which was well understood in this country. It was unfortunate that there should be a confusion of terms. There was a true oil of geranium obtained from one or more species of Pelargonium.

A paper was then read on

THE PROGRESS OF CINCHONA CULTIVATION AND ALKALOID PRODUCTION IN BENGAL.

BY C. H. WOOD, F.C.S.

The paper is printed at p. 621, and gave rise to the following discussion:—

Dr. DE VRIJ said that he was deeply interested in this subject, as might be inferred by the meeting when he said that he had left his own country on the previous afternoon in order to be present at that meeting. He congratulated Mr. Wood that he had met with the great success that he had so long desired. The subject of cinchona cultivation was a hobby of his (Dr. De Virj's). The speaker quoted several passages from Mr. Wood's paper, and expressed a general agreement with what had been put forward by Mr. Wood. He admitted that the calisaya was a very valuable bark, but he wished to direct the attention of Mr. Wood to the bark from *C. pubescens*. According to the latest information he had obtained from Mr. McIvor this species grows very rapidly, even faster than the succirubra, and the bark was a very good one. From specimens of the first renewal he had obtained 9 per cent. of total alkaloids, which yielded 7·2 per cent. of quinine sulphate. He said that there had been a question between various gentlemen as to whether the mossing or renewal process, or the process of coppicing was the better mode. Mr. McIvor was a great advocate of the mossing process. At the meeting of the Quinological Congress in Amsterdam in April last, at which Messrs. Weddell, Planchon, Howard, and other eminent quinologists were present, the question was debated, and it was decided that the process adopted by Mr. McIvor produced the best and richest bark, and that that was the future of cinchona cultivation. His own personal experience was that the bark produced by coppicing was much poorer than that produced by renewal. The renewed bark of succirubra contained three times as much quinine as the original bark. He was happy to hear the statement of Mr. Wood as to the relative richness of the root bark in alkaloids, as compared with the bark of the stem and branches, because it confirmed what he had himself stated in 1864, as was published in the *Pharmaceutical Journal*, although at that time the fact was doubted by the eminent quinologist, Mr. John Eliot Howard. In the *Pharmaceutical Journal* of December 1876, there was a report by Surgeon-General Smith of the Indian Medical Department who there spoke against the preparation made by Mr. Wood. It was interesting to see how pharmacists were often condemned by medical gentlemen who did not understand the subject. Dr. Smith reported that in an experiment made in his presence, three drachms of dilute hydrochloric acid failed to dissolve one drachm of powder in two ounces of water. This sparing solubility Dr. Smith considered to be very objectionable. If it had been true, of course it would have been very objectionable, but it was not true. He (Dr. De Vrij) must confess that he was angry when he read this statement, for he was a great advocate of cinchona febrifuge. It was a great boon to procure a cheap medicine like that. He regretted that the able editor of the *Pharmaceutical Journal* had not made any remark in reply to Dr. Smith, for he was more than competent to do so. It was well known that 324 parts of quinine required 36·5 parts of pure HCl, and that 308 parts of cinchonine or cinchonidine required the same quantity. Now if this were true of the individual alkaloids it must also be true of the mixture, and therefore if Mr. Wood had done his business well, the statement of Surgeon-General Smith could not be correct. He (Dr. De Vrij) had examined a sample of this febrifuge, forwarded to him by Mr. Markham, and had satisfied himself that it was soluble and that Mr. Wood had proved himself to be the right man in the right place. He (Dr. De Vrij) would suggest that the preparation should be called "quinetum" instead of "cinchona febrifuge." The termination, *etum* was the Latin for a collection. "Arboretum" was a collection of trees, and "quinetum" might be used to designate a collection of *quina* alkaloids, such as this substance contained. He agreed with Mr. Wood in the statement that the febrifuge should not be given in larger quantities than quinine. All barks contained a certain amount of amorphous alkaloid, and he had found that the Darjeeling bark contained more than other barks. Professor Binz of Bonn had proved by physiological experiments upon rabbits, etc., that the amorphous alkaloid was much more toxic than quinine, so that persons might be injured by a certain dose of the amorphous alkaloid, while they would be able to bear an equal dose of quinine. He agreed also with Mr. Wood that "in forming an opinion of the value of this preparation it should be regarded as a pharmaceutical preparation rather than as a chemical product." In making that remark, Mr. Wood showed that he was a real pharmacist. Cinchona febrifuge was not a chemical compound, but it was a very good pharmaceutical preparation.

Mr. PHILLIPS, in speaking with regard to the commercial aspect of the question, said that year by year the quantities of the Indian bark sold in this country had increased, and the price obtained had increased also. Last year he obtained a very high price for the article in consequence of the small stock of barks that were in in hand, the quantity having been reduced in consequence of the disturbances in Columbia and Ecuador. As Dr. De Vrij had said the bark from Darjeeling was very much inferior. There was no doubt that Indian bark would be the principal bark which in future came to this country. The bark coming from Columbia had been very much mixed with inferior barks of late years, and could not be depended upon. The bark from Java always went to Amsterdam, and he never saw it.

Dr. PAUL said that he had very little to say except with regard to one remark which had fallen from Dr. De Vrij. He gathered that Dr. De Vrij referred to an article in the *Pharmaceutical Journal* where reference was made to the preparation of bark known by the name of cinchona febrifuge, which was being tried in India with various results. He believed that Dr. De Vrij expressed his opinion that in publishing the statement which had appeared in the Journal* on the authority of Surgeon-General Smith, he had failed to do something which he ought to have done. He objected to that opinion, for his business as Editor did not require him to do more than furnish information, so that the readers of the Journal might have an opportunity of knowing what was being done and said in India about this preparation. He left it for those who were more personally interested to make any comment or criticism which they thought desirable. Dr. De Vrij, being the rider of this hobby horse, if he found a fence in front of him was the man to take the horse over it. He (Dr. Paul) had merely put forward what was stated officially by a gentleman of position and authority. No comment was made upon the statement, and no contradiction had been offered; and therefore they were bound to take the statement for what it was worth. It was too late now for Dr. De Vrij to come forward and criticize the statement, and say that he (Dr. Paul) ought to have done what was really Dr. De Vrij's work. Surgeon-General Smith stated that one of the objections to the cinchona febrifuge was its insolubility. The whole report was of a vague character, and the account given of the preparation referred to was not at all definite. No indication was given as to the strength of the acid used. There were several other objections which had been raised against the preparation, and they might have contributed to the distaste with which the article in the Journal was received by Dr. De Vrij. One of those objections was that patients of the hospitals after having had one dose given to them had disappeared by the next morning, for fear of having to take a second dose.

Dr. DE VRIJ said that Mr. Wood was not an unknown man. He was the editor of the pharmaceutical 'Year Book,' and if such a gentleman was accused of putting forth a preparation as soluble while it was not soluble, the accusation was a very important one, and therefore he (Dr. De Vrij) thought that a chemist like Dr. Paul might have said, in a couple of lines, that the statement made by Dr. Smith that the preparation was insoluble was not correct.

The PRESIDENT thought that the solubility of this quinine mixture would very much depend upon its absolute purity. If it was a very rough article, and contained much of the natural tannin of the bark, it would be so much less soluble.

Mr. MOSS said that he did not think that the word "quinetum" would be a very good name for the substance in question, for such a word would rather indicate that it was a collection of quinines instead of a mixture of alkaloids. The word "cinchonetum," which perhaps might be a better word, would be out of the question, because it would indicate a collection of cinchona barks, or, perhaps a collection of cinchona trees in a garden, and when we came to such words as "cinchonalkaletum," more descriptive still, we get a word as unmanageable in a prescription as the name "cinchona febrifuge," which Dr. De Vrij deprecates. Another objection to the term "quinetum" was that it was already applied to a trade article, which, according to the fashion of the day, might or might not be registered.

Dr. DE VRIJ said that he had not derived the name "quinetum" from "quinine," but from "quina."

Dr. PAUL asked to be allowed to offer two or three more remarks. He would say with great deference to Dr. De Vrij, compared with whom he (Dr. Paul) was a novice in the matter, that it appeared to him the question as to the subject before them was an exceedingly simple one, and was not to be judged from the hobby-horse point of view, but from a dry regard to matters of fact. The Government of India had bestowed great pains in introducing the cultivation of cinchona trees into two, or he might say three parts of India, viz., Madras, Bengal, and Ceylon. In Madras, the cultivation had been fairly successful, and in some cases eminently so. In Ceylon it had also been very successful. In both those places success had been obtained in producing cinchona trees which yielded bark very rich in quinine, the alkaloid which still bore the highest repute amongst medical men. In the province of Bengal, however, the Government had introduced a tree which did not yield quinine, or which yielded it to such an insignificant extent that it was practically valueless for the purposes of quinine manufacture. The bark of this tree did not yield, on the average, more than from 1 to $1\frac{1}{2}$ per cent. of quinine; and the greater part of the alkaloid contained in it consisted of cinchonidine and cinchonine. The consequence was that this bark was valueless in the English market for the main purpose for which bark was sold, viz., the manufacture of quinine. As there were immense plantations of this tree in Bengal, it became a question what should be done with the bark, since it could not be sold for quinine making, and it was more than sufficient to supply the wants of druggists for galenical preparations. In this extremity the Government of India had turned its attention to the manufacture of a preparation which, as Mr. Wood very fairly put it in his paper, was a pharmaceutical preparation more than a chemical one, and contained the total alkaloids mixed together in much the same condition as they would be met with in the liquid extract of bark. This product, consisting of a mixture of the alkaloids present in red bark, had been prepared not only in India where the Government had the advantage of the skill and experience which Mr. Wood had brought to bear with so much effect, but it had been made by a gentleman in this country, Mr. Whiffin, who had introduced it under the name quinetum. And no doubt the preparation of this substance was a good mode of using up the succirubra bark of Bengal which was

* See *Pharm. Journ.*, vii., p. 499.

otherwise comparatively valueless, and of placing in the hands of the medical practitioner a cheap material possessing the virtues which resided in cinchona bark. But we still come to the question whether the quinetum as made at Battersea, or the cinchona febrifuge, as made in Bengal, however skilfully prepared and carefully administered, would compete with the pure alkaloids; whether it would even be able to stand against the sulphate of cinchonidine, for that was a definite substance, while this preparation might be one thing to-day and another thing to-morrow, according to the material which was operated upon, and the skill or perhaps in the case of India the ignorance, of the natives who might be deputed to carry out the details of the process. All this was a matter of chance and accident, and there was no guarantee that this preparation would contain to-day, as it had done hitherto, 15 or 20 per cent. of quinine. It might be merely a *misch masch* of an indefinite value, containing mainly the red substance which any one who was conversant with the working of red bark knew it was so easy to introduce into his products. Whatever, therefore, might be the advantage of using up the bark in the preparation of the substance in question, it was still a question whether it would be possible for either quinetum or the cinchona febrifuge to stand against the preparations of the pure alkaloids as prepared and delivered in this market.

Dr. De Vrij made a few observations in reply to Dr. Paul.

Mr. Wood then replied upon the discussion. He said that he would, in the first place, offer his thanks to Dr. De Vrij for the very kind manner in which he had come forward upon this question. That gentleman was so well known as an eminent worker in this subject, that anything falling from him would necessarily be entitled to considerable respect. The discussion generally had been somewhat discursive, but there had been a tendency on the part of some of the speakers to introduce a comparison between the plantations of Bengal, and those of Madras and of Ceylon, and possibly of South America. There seemed to have been a general comparison of barks for the purpose of putting down the Bengal bark as the very worst. He was not at all afraid to have such a comparison, provided that the substances were judged of fairly upon their merits. He believed that they could produce an extremely useful and valuable bark in Darjeeling, and at a very low price. Although a scientific society such as the present was interested in the chemical aspect of the question, rather than the economical aspect, still the prime cost of producing a bark was an important element in judging of what profit it would be when it was sold. The barks of which he had spoken had been grown at Sikkim at a very cheap rate, but they could not make a comparison of them with the barks from Madras and other districts until they knew what all these barks would cost to produce. Dr. De Vrij had suggested the *Cinchona pubescens* as a bark which they should cultivate in India, and that gentleman had also a prejudice in favour of Madras bark. He (Mr. Wood) would remind Dr. De Vrij that in Madras they had had a great deal of scientific assistance and a long start in the cultivation of the cinchona tree before it was introduced into Bengal. He believed that they could claim that in a little time Bengal would be able to produce barks which were equal to the *Cinchona pubescens* which had met with so much approbation from Dr. De Vrij. They had on the Bengal plantations trees which would yield bark of very high quality, and containing large amounts of quinine and other alkaloids; but he had omitted from the paper any reference to them, because they were not yet in a position to affect the practical aspect of the question. They could put forward specimens of calisaya bark which were equal to some, though perhaps not the best of the Ledgeriana bark of Java, and these were the varieties the cultivation of which they were using their efforts to extend. The officinalis bark grew well in Madras, but it did not grow well in Bengal; but it was possible that the calisaya would grow better in Bengal than in Madras. The conditions of growth were not the same in both cases. With regard to the question of taking the bark the advantage had been given to Madras, because their method of mossing had produced a very magnificent and rich bark. But that, again, was a question which to judge fairly required the economy of the process to be taken into consideration, and it was open to discussion whether the process of mossing in Madras was economical, notwithstanding the high price which the bark fetched. But certain it was that whether the process of mossing was economical or not, it had failed in Bengal. Insects and more especially the ant, got beneath the moss, and destroyed the new bark as soon as it was deposited. As to the solubility of the product which had led to a little controversy between Dr. Paul and Dr. De Vrij, he (Mr. Wood) thought that it was quite unnecessary to discuss it. Anybody who wished to satisfy himself upon that point could try an experiment; and it was so obvious that Dr. Smith had made a mistake in what he had written about it that it was unnecessary to take any further steps to refute his statement. But he would point out that Dr. Smith was the Surgeon-General of Madras, and that Madras had produced a similar preparation from its plantations, and that this preparation had failed, and had been abolished because the Madras people could not make it pay. When the same kind of preparation was sent to Madras from Bengal it was in human nature that the Madras people should be prepared to find all the fault with it that they could. The substance went to Madras without any information accompanying it, and it was almost unlabelled, and it was very probable therefore that they knew very little about it, or about how it was to be dispensed, and they might have fallen into some errors with regard to it. Then the question of the name had been brought forward by Dr. De Vrij who had recommended that the substance should be called quinetum. He (Mr. Wood) had carefully considered all the names that had been brought forward, and he confessed that up to the present time he had not come across one that was thoroughly satisfactory to him. He had called it "cinchona febrifuge" in desperation. He had looked at the word "quinetum" in several lights. Upon turning to a Latin grammar, he found that the termination *etum* did not mean merely a collection of things, but it meant specifically a collection of plants and flowers, and, as far as he could find, was only used for plantations. We had the words "*vinetum*," for a vinery, and "*arboretum*" for a collection of trees. It seemed to him rather an odd thing to call a powder a collection of trees, or a plantation. He inferred that Dr. De Vrij meant the name to be significant of cinchona plantations, and that by labelling the substance "quinetum," which, as he (Mr. Wood) translated it, meant a plantation of quina trees, Dr. De Vrij intended to signify that this preparation was from such a plantation. But the derivation of the word "quinetum" was not the main cause of his (Mr. Wood's) reluctance to adopt the name. The consideration which mainly influenced him was that it was a Latin word, and that apart from the mistakes which it might lead to with regard to its being a new alkaloid or anything of that description, a Latin name was inconvenient for use in India. Dr. De Vrij had asked, "Suppose I wanted to write a prescription, how should I represent this thing?" That was a perfectly fair question, and for the name of the article in this country, such a Latin name would be most convenient. But for the purposes for which this preparation was intended to be used in India, that prescription would never be written. There was not in India, as in this country, a class of physicians, and a class of highly skilled pharmacists to dispense what the physicians wrote. This stuff was intended to go into the villages of Bengal, and to be given to the people themselves to take in their own fashion. Probably it would never fall into the hands of pharmacists, or, at all events, it would do so to only a very slight extent. It was intended to go directly to the masses of the people, and they would make up their own little pills, or take it in powder stirred in water, according to their own notions. For such a purpose a word was wanted which could be easily translated into the vernacular. The word "quinetum" did not seem to meet that requirement at all. It was true that the natives of India had learned to understand the name "quinine," and to highly appreciate the substance; but if the cinchona febrifuge was given to them under the name of "quinetum," they might be led to think that it was some kind of quinine or other, and it did not seem to be strictly fair to produce that impression. Pharmacists did not want them to regard this thing as quinine, but they wanted them to regard it as a distinct febrifuge. It so happened that the word febrifuge could be very readily translated into several of the native languages. There was, for example, a Bengalee word which exactly corresponded with it, and signified "fever-killer." That was the main reason why he still clung to the title "cinchona febrifuge," although he admitted that it was not a name which was perfect in all respects. Then he came to some remarks which had been made by a gentleman who had worked upon the subject of quinine to some extent, and who had treated this subject in what he regretted to say was a somewhat hostile spirit. He referred to the remarks of Dr. Paul. Having heard Dr. Paul's later observations, he (Mr. Wood) could understand why Dr. Paul had selected for publication in the *Pharmaceutical Journal* all those extracts from Indian papers which bore against the febrifuge, and had most remarkably overlooked all the medical and other reports which told in its favour. It had certainly been a matter of comment in India that the *Pharmaceutical Journal*, which was supposed to be well-informed on all these subjects, should, after a mass of matter had been written and published on this preparation, have been able to select only one small passage from a report of Dr. Smith, the Surgeon-General of Madras. He thought, on the whole, that it would have been better to omit the subject altogether than to produce one small, miserable extract, and to pretend that that represented the general results that were being obtained in India.* But as Dr. Paul proceeded to develop his ideas upon this subject, he (Mr. Wood) was led to understand why he should persistently overlook all that was favourable to it, because he found him so reduced for chemical definitions as to invent such a term as "misch-masch." He (Mr. Wood) confessed that up to the present time he had not met with such compounds, and he did not know what they were. He was not, therefore, in a position to judge of, or to reply to, any observations upon terms of that description, but he thought that Dr. Paul went even farther, and if he understood that gentleman rightly, he deprecated the idea of using a preparation, the composition of which was "dependent upon the ignorance of the manufacturers, and the chance and accident which they would bring to bear upon it." He did not know how far he was to understand that observation, and he should like to ask Dr. Paul whether he was really correctly quoting his words. Of course, if Dr. Paul imputed that this preparation was to be distrusted on account of the ignorance of the manufacturer, he (Mr. Wood), being mainly responsible for the quality of the product, was scarcely in a position to retort upon Dr. Paul. He had no wish, at any rate, to degrade the discussion into bandying words of abuse, when he thought that the ordinary courtesy which obtained between scientific men ought to have prevented such words being originated.

Mr. Passmore said that he was afraid that in consequence of deafness resulting from a cold, Dr. Paul had failed to hear the greater part of what had been said by Mr. Wood. He (Mr. Passmore) was not concerned to dive into a discussion as to the ulterior motives which might have guided Dr. Paul in selecting and putting into the Journal certain extracts, but there was one subject to which reference had been made upon which he felt warranted in speaking. Up to the present time there had been received at the editorial office information with respect to the result obtained with the "cinchona febrifuge" preparation from two sources only: one was an Indian newspaper, which was quoted as the authority in the article to which Dr. De Vrij had referred; and another was Dr. King's Report and his 'Manual of Cinchona Cultivation,' an appendix to which contained three or four favourable testimonials from medical men. These also had been quoted in the Journal, and they constituted all the information that had reached the Journal on the subject. He might remind Mr. Wood that it was only two or three days ago that he (Mr. Passmore) was complaining to him that the *Pharmaceutical Journal* was not kept supplied with information respecting this interesting subject, and he asked Mr. Wood whether he could suggest any way by which the information could be obtained. Mr. Wood told him—what he (Mr. Passmore) knew before pretty well—that very few copies of the reports were printed, and those that reached England were soon distributed. The reports, in fact, were very difficult to get hold of; and he had half suggested to Mr. Wood that the *Pharmaceutical Journal* might be furnished with copies. The remark which Mr. Wood made to him was that he did not think it advisable that such information should be furnished; or, at any rate, Mr. Wood went so far as to say that he thought that the less that was said in the discussion of these matters the better, giving reasons which need not then be mentioned.

Mr. Wood: May I ask Mr. Passmore whether the *Indian Medical Gazette* is a publication quite out of the reach of the Journal?

Mr. Passmore: It does not reach us.

Mr. Wood: It is a publication which is known in India, and it gives full information.

Mr. Passmore: But we are in London.

The President, in closing the discussion, said that it was perfectly certain that the Pharmaceutical Society, and the staff of the Journal, could not possess all the newspapers and all the information which the world produced, and if their friends in India would only send the information, and the journals which contained the information, to the Pharmaceutical Society, the Journal would fairly represent all sides. He believed that it was merely through the accident of only getting one side of the question that the Journal had presented only one side to the public, if such was the case. However, he had no doubt that the remarks which Mr. Wood had made on the subject would be of great value, and would be attended to hereafter. He was sure that they were all very much obliged to Mr. Wood, and also to Dr. De Vrij, and the other gentlemen who had taken part in the discussion. There were three more papers down for reading that evening, but as the hour was late he would ask the meeting to take them as read, and then they would appear in the Journal. One of these papers, on a Spurious Balsam of Tolu, by Mr. Naylor, is printed on p. 624; the other two, by Mr. Gerrard, on Thymol, will appear next week.

It was then announced by the President that on Wednesday, the 20th instant, Professor Redwood would deliver a lecture on Spectrum Analysis, illustrated by the electric light.

* For evidence of the totally unfounded nature of Mr. Wood's statements and inferences, the readers of the Journal are referred to *Pharmaceutical Journal* (3), vi., pp. 223, 367, 411, 566, 570, 772; vii., pp. 537, 807. It must, however, be admitted that Mr. Wood is so far correct that the application of the term "misch-masch" is consistent with the principles of what is known as "abusive nomenclature," inasmuch as the term in question signalizes the chief characteristic of "cinchona febrifuge," as will be seen by reference to Flügel's German Dictionary, where "medley" and "hodge podge" are given as the English equivalents of that term.—B. H. P.

NORTH BRITISH BRANCH, EDINBURGH.

The third meeting of the present session was held in the Museum of Science and Art, on the evening of Tuesday, 29th ult. By the kindness of Professor Archer, billets were issued asking the attendance of those connected with the Society at the Museum.

There was a good attendance, and the chair was taken by the President of the Branch, Mr. J. B. Stephenson, who, on introducing the Professor, remarked how much indebted the Society was to him for the present as well as for past kindness, and he felt certain that what Professor Archer had now to say would interest the meeting, the subject being one of considerable importance to all present.

In commencing his remarks, Professor Archer said that the great object to be kept in view in the arrangement now about to be submitted was one by which the student might be taught without other aid than that of having the specimens plainly before him, so that the eye might easily comprehend the various characters of the drug under observation. Professor Archer then proceeded to describe to the meeting a new arrangement which he had made for protecting and showing articles for museum and class purposes. The members of the Society would, he said, be aware of the great difficulty which was experienced in arranging materia medica specimens in such a way that they could be fully and fairly consulted by the student and yet be preserved. All the arrangements which he had seen had failed in achieving this double object. Either the specimens were not placed before the eyes so that the student could readily examine them, or if the student was allowed to handle the specimens these had in a short time to be replaced. But if they had very choice specimens, as they ought to have, it became a very difficult, as well as a very expensive matter to replace them. It had surprised him very much to observe that the materia medica part of the museum was perhaps more frequented than any other, except that of natural history, and until lately not excepting even that. He had, then, naturally had an extreme desire to provide for students of pharmacy every possible means to enable them to carry out their studies, and he thought he had hit upon a plan which would meet the purpose. So far as he had yet gone he had confined his arrangement to the vegetable portion of the British Pharmacopœia, or drugs, because he felt that it would be a difficult thing to arrange the chemical portion in such a way as to enable the different specimens to be recognized without their being handled and tested. The plan adopted was to have a series of upright cases, each occupying an exceedingly small place, in which were placed, under drawings of the particular plants, small glass boxes containing specimens of the drugs obtained from these plants. These glass boxes were, he said, a great improvement upon the glass bottles into which specimens had been hitherto thrust, inasmuch as they received the plant without crushing it. The idea of their use he had gained when he was in St. Petersburg; and he now explained to the Society an ingenious and simple method of manufacturing them with ease and at trifling cost. The Professor took occasion to point out that the museum collection of the pharmaceutical products of foreign countries was probably the best to be found in the world, and was largely consulted, not, he was sorry to say, by Edinburgh students, but by persons from London and other places. In illustrating the manufacture of the boxes, the Professor remarked that on the continent great difficulty had been found in making them, for the sides were no sooner put together than they gave way; but by the manner adopted in the museum the sides were kept in position by outer bars of wood and an inner block, so that when strong paste was used in making the attachments, the box was completed in a very short space of time. So convenient were these boxes as regards space that four cases of about $5\frac{1}{2}$ feet high, 2 feet broad, and 10 inches deep, with 12 glass shelves in each, have all the specimens of the British Pharmacopœia. The foreign collection already referred to was also examined with considerable interest.

The coloured drawings used for the purpose of illustrating each specimen were those from the well known work of Bentley and Trimen, and even the placing of the drawings showed some ingenuity, for they were put upon strong brown paper and the glass face bound in its position by strips of pasted ribbon, so that at any time the drawing could be removed without the slightest injury.

After having spent a pleasant and interesting evening, the President proposed a very hearty vote of thanks to Professor Archer for his kindness in inviting those connected with the Society to visit the museum as they had done that evening. The museum of Science and Art, as a whole, was to him one of the things in Edinburgh of which all might be proud, and well might the delay in Government still hesitating to make additional grants for the extension and completion of such a noble institution cause surprise not unmingled with a feeling somewhat stronger.

Dr. Craig, in seconding the vote of thanks, said that as a lecturer on materia medica he had been very much gratified indeed at the perfect manner in which the manufacture of such useful receptacles for specimens of materia medica had been explained. Among other advantages these boxes possessed, Dr. Craig thought one great recommendation was, that in event of specimen being put aside during the interval between a winter and summer course, from their shape and occupying so little space, the room required, as compared with bottles and jars, would be much lessened. The only suggestion he (Dr. Craig) could offer as to the completeness of the arrangement was, that the doses might be added to the drawings and names of the plants, so that those viewing them might have this information at hand.

Professor Archer, in acknowledging the vote of thanks, thought that the kindness was all the other way, and that he was exceedingly glad to see so many connected with the Pharmaceutical Society present. He did not agree, however, with Dr. Craig's suggestions about the doses, because he thought any one coming to see the specimens for the purpose of really gaining information ought to be a student in the strict sense of the term, and come prepared to study, by having a book with him, from which he could gather all the particulars which it was necessary for him to know on the subject.

The meeting then adjourned.

Proceedings of Scientific Societies.

THE INSTITUTE OF CHEMISTRY.

The first general meeting of this Institute was held on Friday, Feb. 1, at the rooms of the Chemical Society, Burlington House. Dr. Frankland occupied the chair, and there was a very good attendance.

The Chairman opened the proceedings by reading an address referring to the rapid advance made in the science of chemistry during late years, the first impulse to which he ascribed to the establishment of the first practical laboratory for instructing students, by Liebig at Giessen. Amongst the students at that laboratory were several Englishmen, who on their return home endeavoured to follow out the same system. In 1845, however, when he himself was searching for a laboratory in which he could obtain practical instruction in chemical analysis, he could only hear of one, viz., that under the direction of Dr. Lyon Playfair, then carried on in the cellar of the Royal Institution, at Manchester, but which was afterwards promoted to a back kitchen in Duke Street, Westminster. About the same time the College of Chemistry, under Dr. Hofmann, was established, and from it and one or two other laboratories there soon issued an army of chemists who promulgated sound practical teaching throughout the land, and the science soon became a recognized subject in universities, colleges, and even in schools. Thus in 1856 there were in connection with the Science and Art Department alone no less than 115 chemical laboratories, in which 2400 pupils received instruction. Many of these, no doubt, were on a very moderate scale, but their number showed the desire for technical training and the efforts made to meet it. The continual application of analytical chemistry to industrial and domestic life led to the necessity for an organization of those practising it, he having thrown out the idea in 1872 at a dinner given to Professor Cannizaro on his appointment as Faraday lecturer. It did not at first receive much support, but it was resuscitated in 1876, when an attempt was made to originate a scheme of the kind originally contemplated, and it was hoped that it might be carried out in connection with the Chemical Society. A committee was appointed and a report drawn up, but it was ultimately decided, at a meeting held in November, 1876, to found a new society and to get it legally incorporated. The remainder of the address was mainly occupied by a recital of the difficulties which had to be encountered and overcome, including the temporary opposition of the Pharmaceutical Society to the articles of association as originally drawn; and also the further obstacles thrown in the way of the new society by the Privy Council, based on the words of the Pharmacy Act, 1868, which rendered any person calling himself a chemist, who had not passed the examination of the Pharmaceutical Society, liable to a penalty of £5. The committee had ultimately modified the articles so as to obtain the approval of the Board of Trade, but it still intended to institute a system of examinations such as was imposed by no other body and which would have the effect of thoroughly testing the qualifications of future candidates for membership.

Dr. Odling moved a vote of thanks to the Chairman for his interesting and useful address, and also that it be printed and circulated amongst the members. Reference had been made in the address both to the Chemical Society and to the Pharmaceutical Society, of both of which he was a member. The latter was placed in a very awkward position, and he was sure any difficulties which had arisen would have been removed by a little explanation between the two bodies. He was an old student of the College of Chemistry, but he believed that was not the first practical laboratory founded in England. If he remembered rightly, the Birkbeck Laboratory, in King's College, was founded somewhat earlier, under the direction of Professor Fownes.

Professor Attfield seconded the resolution, and mentioned that as early as 1842 a laboratory for instruction in practical chemistry was suggested at the Pharmaceutical Society, and in 1844 steps were actually instituted, and many gentlemen who were now no longer connected with pharmacy, but were ornaments to the science of chemistry in this country received their education there. With regard to the action of the Pharmaceutical Society in 1868 in reserving for its members the title of chemists, he thought on the whole the profession of chemistry was under a deep debt of obligation to the Society for having at that time rescued the name chemist, and provided that in all future time no one but he who had some special education in chemistry should be allowed to take it. Up to 1868, any shopkeeper or huckster could call himself a chemist, but since then no such individual could take the title. Nothing showed more the need of such an organization as had now been founded than the fact that in 1868 no opposition was made to the Pharmacy Bill by any gentleman calling himself a scientific or analytical chemist. Such a bill if introduced now could not be passed. With respect to the action recently taken by the Pharmaceutical Society, he thought it was pretty well known by this time that that Society was really urged to it by the Privy Council.

The resolution having been carried unanimously, the Chairman thanked the meeting or the kind way in which his remarks had been received, and also Dr. Odling for reminding him of the existence of other laboratories. He was aware of the existence of the Birkbeck laboratory, but did not know that it was in operation earlier than the College of Chemistry. With regard to the Pharmaceutical Society he hoped nothing which had fallen from him would be taken as in any way showing hostility towards that Society, which had treated them throughout all the negotiations on this matter with the greatest courtesy. That Sociey had no doubt obtained this Act of Parliament and the title to the exclusive use of the name of chemist, and had therefore a fair ground of complaint at a new body of gentlemen calling themselves professional chemists. He thought the members of the Pharmaceutical Society might with very great propriety term themselves professional chemists, and therefore it was perhaps rather unwise to attempt to take that title without limitation. Still he hoped some mode would be devised by which this title might be shared with the pharmacists, so that the term chemist would not in this country be exclusively devoted to pharmaceutical chemists.

Some further conversation took place with regard to early practical laboratories in London, in which Mr. Dugald Campbell, Mr. Bell, Dr. Gilbert, Mr. James Young and others took part. The Chairman said his remarks only referred to his own experience, but he would take care to correct any inaccuracies on this point before his address was printed.

The Secretary then read the report of the Council, which stated that the most important business since the incorporation of the Institute had been the development of the organization by providing for the admission of all competent chemists. In order to form a nucleus of the society, it was deemed advisable in the first place to invite all chemists of standing in the profession, who were known to the Council, either personally or by reputation, to join. Those having been elected, a Committee was appointed to examine into the qualifications of those seeking admission. Over 150 persons had made inquiries, and 93 had already become candidates for fellowship or associateship, sending in certificates. The Nomination Committee had carefully considered the qualifications required, and had advised that the qualification for a fellowship should be, that the candidate should be not less than 24 years of age, that he had passed through a course of three years' training in theoretical and analytical chemistry, and physics, and had subsequently been engaged for three years, either as assistant to a chemist of repute, or as an assistant or demonstrator in some public institution, or had conducted and published an original research of sufficient merit in the opinion of the Council, on some chemical subject necessitating practical work, or that he had been trained and qualified in some other way which the Committee might deem equivalent. With regard to associates it was required that their age should be not less than 21, that they should have passed through a three years' course of study in analytical chemistry, physics, and elementary mathematics. In very few instances only had the Council found it necessary to depart from this rule. Where candidates were not actually proposed by members of the Council they were required to produce certificates or other documentary evidence that their statements were correct, and it was satisfactory to note that with regard te the associates, such was the satisfactory character of their attainments, that many of them were only debarred from claiming fellowship on account of their age. The object of the Institute had been favourably received by almost all. Of those invited to join at the first meeting, 153 had already accepted, and since then, 160 fellows and 43 associates had been proposed and elected, and 65 had accepted membership. As, however, a very short time had elapsed since the foundation of the society, no accurate estimate could be made of how many would eventually join. At present 225 fellows had joined; 142 had been elected, but not yet formally admitted. The Council was of opinion that a high standard should be fixed not only in chemistry, but in physics, and elementary mathematics, and that such could only be ensured by a carefully arranged system of examination, and a committee had therefore been appointed to draw up an examination scheme. A complete list of fellows and associates would soon be published, and Dr. Frankland had very kindly offered two prizes of £50 each, to be awarded by the Council for the two best original investigations involving gas analysis, conducted by associates of the Institute. In conclusion the Council begged to thank the President and Council of the Chemical Society for their kindness in allowing the use of their rooms.

Mr. Thorpe having moved the adoption of the report;

Mr. Riley thought before it was adopted, they ought to have some explanation of one of the rules which appeared to him ambiguous, and in fact the Secretary had admitted it was ambiguous when he had written to him on the subject. The ambiguity was as to what was a member, and what was a fellow. It appeared to him from the explanation given that there might be fellows who were not members, and he thought that applied to honorary fellows, but then it appeared by another rule that every fellow had to subscribe two guineas, and it did not seem right that gentlemen should be called upon to subscribe who did not receive a copy of the report and balance sheet; nor did he see how an honorary fellow could be elected, and then made to pay for it.

Dr. Tidy said he had not heard anything of this Institute until November, and he considered that it had been got up in what appeared to be somewhat a hole and corner manner. As a teacher of chemistry at one of the large hospitals, he rather wondered that he had not been made acquainted with it, and he knew several who were in the same position. He never heard anything of the matter until he received a paper saying he had been elected a fellow of the Institute.

The Chairman said he feared Dr. Tidy did not read the *Chemical News*.

Dr. Tidy said in reply that he did not mean that he had not seen it in the *Chemical News*, but had never been informed of it officially. He also had a difficulty in understanding the difference between a member and a fellow.

The Chairman suggested that the matter should be explained by the solicitor. He might add, however, that up to the present time no fellows had been elected who were not also members.

The Solicitor said it had been considered desirable that the benefits of legal incorporation should be obtained, but this could only be done in three ways, either by a special Act of Parliament, by a Royal Charter, or by registration under the Companies Act of 1867; and the latter method was chosen. Under that Act, the incorporation had to receive the sanction of the Board of Trade; and under it, also, members only were recognized, not fellows. Consequently all persons belonging to the Association were in the eye of the law members. The term fellow had been used contrary to his advice, because some gentlemen in the profession deemed it better that members of this association should be called Fellows of the Institute of Chemistry, rather than members, but the term throughout the articles of association was member. Clause 55 was inserted for the express purpose of giving the Council power to confer the title of Honorary Felllow on persons who should not be members, and he thought the only mistake was in saying that honorary fellows should pay a subscription. In reality the terms fellow and member were interchangeable, except with regard to persons resident abroad.

Mr. Riley suggested that some minutes should be made which would meet the facts of the case, and a somewhat lengthy discussion ensued upon the same point.

Dr. Odling suggested that it would be much better if they were to call themselves members, and drop the term fellows altogether.

Mr. J. Denham Smith moved that this be done, which was seconded by another member.

Dr. Tidy said there was a very definite distinction between fellow and member.

Dr. Odling doubted whether it would be possible at the present moment to make the alteration.

The Solicitor said they could resolve to use the term member in preference to fellow, but they could not alter the regulations except on notice.

Dr. Hake suggested that if the word fellow were omitted there would be only one class of members, including associates.

The Solicitor pointed out that throughout the articles a distinction was drawn between associates and members.

Mr. Carteighe said he objected to dropping the word fellow.

It was then moved by Mr. Denham Smith and carried that the question of the distinction between the term member and fellow be referred to the Council.

Mr. Riley then seconded Mr. Thorpe's motion, and it was carried unanimously.

The Treasurer (Dr. Wright) then read the balance sheet as made up and audited to December 31st, showing receipts from 92 members' admission fees £193 4*s*., 79 members' subscriptions for 1878 £165 18*s*., 8 members' life subscriptions £168, and 2 associates' subscriptions for 1878 £2 2*s*., making a total of £529 4*s*., out of which had been paid, printing, postage, etc., £23 7*s*., and petty cash disbursements 19*s*. 11*d*., leaving a balance of £501 7*s*. 1*d*. The Treasurer added a further statement up to 12 o'clock of that day, to the following effect: 222 entrance fees had been paid in, 201 members' subscriptions for 1878, 18 life subscriptions and 17 associates' subscriptions. The total receipts since the formation of the Institute being £1273 13*s*. 7*d*. Out of this there had been a certain amount of expenditure, namely, £69 5*s*. for printing, etc., £7 19*s*. 6*d*. for office furniture, £143 19*s*. for law expenditure, and £22 3*s*. 1*d*. petty cash disbursements, leaving a balance in hand of £1034 3*s*.

The Chairman said the only remaining business was that of electing four censors in accordance with section 47 of the Articles of Association.

The Council had nominated nine gentlemen whose names were read, and on scrutineers being appointed and a ballot taken, the following four gentlemen were elected:—Dr. Odling, Professor Abel, Dr. Delarue, and Professor Roscoe.

This terminated the proceedings.

Correspondence.

C. Jones is thanked for his communication.

E. B. Vizer.—All such information, so far as it is available, is given already. We are not in a position, neither would the columns of the Journal be the place, to give details as to the preparations of particular manufacturers.

E. B. Ivatts.—We are much obliged to you for your kind offer, but we fear that satisfactory results could not be obtained from the examination of a small quantity.

"*An Inquirer*."—(1) We think this question had better be put to the maker or seller of the foot warmer. (2) A full account has already appeared in this Journal on several occasions. See especially vol. i. (present series), p. 43, and vol. vi., pp. 823 and 946. (3) Glycerine of tragacanth.

C. Griffith.—*Petasites fragrans*. See "The Month" for January, 1877.

C. J. B.—At present we are not acquainted with a process for the assay of opium that will give satisfactory results in all cases. See the papers read before the Pharmaceutical Conference at Glasgow in 1876, reported in vol. vi. of this Journal.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Mackay, Dr. De Vrij, Professor Fluckiger, Mr. Summers, Mr. Jackson, Mr. Barnes, Mr. Taylor, Mr. Jackson, Mr. Jones, Mr. Walker, Mr. Naylor, Mr. Talbot, Inquirer, Veritas, Major, X. Y. Z., L., R. C. B.

THYMOL, AND ITS PHARMACY.*

BY A. W. GERRARD, F.C.S.,

Teacher of Pharmacy at University College Hospital.

At present the attention of the medical profession and others is being directed towards the substance known as thymol or thymic acid, and much experimental work thereon is being carried out in several of the London hospitals, with the view to extending our knowledge of its remedial and antiseptic value. For the past six months I have had much to do with this drug, and made a number of experiments thereon which have developed a few novel facts concerning it, and of a character likely to prove useful to the pharmacist.

Thymol is a homologue of the phenol series, and represented by the formula $C_{10}H_{14}O$. Several plants of the order Labiatæ are known to yield it, the principal of which are the common thyme, *Thymus vulgaris*, and horse mint, *Monarda punctata*; it is also obtainable from a plant of the order umbelliferæ, called *Ptychotis ajowan*, an East Indian drug. It is from the essential oils of these plants that the thymol is finally extracted.

The separation of thymol from oil of thyme can be effected by two processes, both of which are of a simple character. Thus, when oil of thyme is treated with an equal volume of caustic soda solution, 1 in 5, and well shaken, the thymol only is dissolved by the alkali and, after standing for a few moments, forms a separate layer; this upon withdrawal and neutralization with hydrochloric acid, liberates the thymol which rises to the surface; it should be further distilled from water. Prepared in this manner it is an oily liquid, said to be incapable of crystallization. The second and best process is to submit oil of thyme to a low temperature for a few days, when the thymol separates in the crystalline state. Flückiger and Hanbury made thymol by submitting oil of ajowan to a temperature of °O C., and obtained 35 per cent. in superb tabular crystals. Oil of thyme is stated to yield 50 per cent. of thymol.

As found in commerce, thymol consists of irregular broken crystals, nearly transparent and colourless; the taste is burning and aromatic; sp. gr. 1·028, but lighter than water when fused; its melting point is about 44° C. When once completely fused and allowed to cool to the ordinary temperature it will maintain itself in the fluid condition for several days, but the contact of a crystal will at once cause it to crystallize. It is freely soluble in alcohol, ether, chloroform, benzol, carbon bisulphide, fats and oils, and but sparingly in water and glycerine. The alkaline hydrates of potash and soda are powerful solvents of thymol; ammonia dissolves it but sparingly. The potash and soda solutions are spoken of by some authors as chemical combinations, but the following test will demonstrate them otherwise. When shaken with ether, the thymol can be entirely removed and obtained as a neutral volatile residue.

The principal property ascribed to thymol is that of a powerful antiseptic, superior even to carbolic acid. Some experiments of S. Leon, were published in the 'Year-Book of Pharmacy,' 1876, p. 279, on the antiseptic properties of thymol compared with carbolic and salicylic acids. The author found that thymol possessed much greater power than either in arresting the fermentation of sugar and the decomposition of albumen and milk. Bucholz has also published the following table of comparative values of antiseptics, giving to thymol ten times the power of carbolic acid.

TABLE OF COMPARATIVE VALUE OF ANTISEPTICS.
BUCHOLZ.

Name.	Colytic.	Destructive.
Chlorine	—	2·5
Thymol	200	20
Sulphurous Anhydride	—	66
Salicylic Acid	66	31
Carbolic Acid	20	25
Alcohol	5	0·5

My first association with thymol is due to Dr. Radcliffe Crocker, Assistant Physician in the Skin Department of University College Hospital, who conceived the idea that it might prove of value in treating the diseases of his department, and for the past six months he has used it extensively and successfully. His results, which are of interest to the medical profession, will shortly be published in the *British Medical Journal.*

A relation of the behaviour of thymol towards various solvents under the varying conditions of heat and cold, may be termed its pharmacy, and I will now give my experience in this respect. Of the solvents of thymol already mentioned, I shall consider only the following, as being the best adapted to the various uses to which it may be medicinally applied, viz., water, rectified spirit, glycerine, fats, and alkalies.

The strongest aqueous solution of thymol obtainable, using cold water, is 1 in 1200, but with hot water 1 in 1000 can be dissolved; a solution of 1 in 900 which I prepared with hot water remained clear for twenty-four hours, and then began to deposit crystalline needles, mingled with prismatic plates throwing off beautiful coloured reflections. This then shows that the strongest permanent watery solution of thymol available is 1 in 1000; a solution of this strength applied in the form of spray was found by M. le Baron de Watteville to be of especial value in destroying the fetor of a carious nasal bone, and he preferred it to a solution of permanganate of potash of the same strength.

Rectified spirit will dissolve its own weight of thymol, but on dilution with water most of the thymol is separated; the strongest spirituous solution miscible with water in any proportion without turbidity is one of 4 grains in the fluid ounce.

The power of glycerine as a solvent of thymol is not great; cold glycerine dissolves it but sparingly, hot glycerine more readily. I find 1 grain dissolves in two fluid drachms of heated glycerine, and on cooling deposit s no crystals. If this glycerole of thymol be added to water in equal parts, turbidity is produced, and continues till 4 volumes of. water are reached; thus then 1 of thymol is soluble in 120 of glycerine, and can be reduced with water to 600 parts, forming a clear solution. This glycerine solution possesses, according to Dr. Crocker's statement, special advantages for preparing lotions, the presence of the glycerine obviating the drying effect upon the skin produced by aqueous or spirituous solutions of thymol alone.

Fats and oils, and with these I include vaseline,

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Feb. 6, 1878.

are excellent solvents of thymol, but require to be heated with the drug to ensure perfect solution and diffusion, and unless particular attention be paid to this, much irritation may be caused a patient by minute undissolved particles of thymol being present in an ointment. The process I prefer in making ointments is to dissolve the thymol in a few drops of spirit, and then mix in the basis. Two strengths of ointment have been principally used in our hospitals, containing respectively 1 and 5 per cent. of thymol, with vaseline as the basis. Unless elegance be desired I see no important advantage in vaseline over lard.

With reference to vaseline as a solvent of thymol, I have found since making these notes that a 5 per cent. solution prepared by heat has, in four days, its surface covered with minute crystals of thymol, so that vaseline can scarcely be considered an eligible basis, unless the thymol be admixed as a spirituous solution.

The caustic alkalies, potash and soda, dissolve thymol readily; 70 grains are dissolved by 22 grains of caustic soda, or in simpler numbers for practical adoption, 1 grain of caustic soda dissolves 3 grains of thymol. Of caustic potash 1 grain dissolves $2\frac{1}{3}$ grains of thymol. These alkaline solutions may be diluted with water in any proportion without separation, and are likely to prove the most useful and economical of any of the preparations of this drug, especially where a strong solution is desired.

In a comparison of the commercial values of thymol and carbolic acid, the thymol is at a disadvantage, being as much per ounce as the latter is per pound, but valued as antiseptics by the statement of Bucholz that 1 of thymol is equal to 10 of carbolic acid, then the difference is not so great.

With reference to the supply of this drug, should the demand be large, I believe some difficulty would at first be experienced in meeting it, but eventually I think the supply could be made to meet the demand, for I have recently been informed by a medical gentleman, native of Calcutta, that the Ajowan is a most abundant production of the Indian Empire, growing as a weed over immense tracts of country; therefore then it is from this source we may suppose our future supplies would be drawn.

In conclusion I may say in favour of thymol that all experimenters with it, so far as I am acquainted, are unanimous in their opinions of its high value, giving it a position above any other body of its class we have at our command. Its pleasant odour and non-poisonous property are also very important features of which few antiseptics can boast.

EXAMINATION OF COMMERCIAL OIL [OF THYME (SO CALLED ORIGANUM).*

BY A. W. GERRARD,

Teacher of Pharmacy at University College Hospital.

Judging from the published statements, that oil of thyme contained 50 per cent. of thymol, and the simple method for its extraction, I imagined I should be able to prepare my own thymol as a paying operation, oil of thyme being 2*s.* 6*d.* per pound, and thymol as much per ounce.

The first sample of oil of thyme I purchased, to my surprise after proper treatment yielded not a particle of thymol. Eight more samples were then obtained, four of the *huile rouge de thym*, or red oil of thyme, and four of the *huile blanche de thym*, or white oil of thyme. They were examined first by shaking in a graduated test tube with an equal volume of caustic soda solution one in five, and on separation the increase in volume of the alkaline layer was observed, and only in one instance was an appreciable increase apparent, and that to the extent of 12 per cent. In each case the alkaline solution was removed and neutralized with hydrochloric acid; in all of them turbidity was obtained, but in one case only in sufficient quantity to be estimated; the separated oily matter in this one case formed nearly 12 per cent. of the oil from which it was extracted. Upon examination it differed in colour, odour and taste from thymol, and I would not pronounce it as such.

The same samples were now surrounded with loose ice for three days, when it was found that not the slightest trace of crystalline or other matter had separated.

These results then are entirely of a negative character, and show that thymol is not present in the oils of thyme of English commerce, and lead us to the inference that it must be extracted in the countries of its production, the residual cymene and thymene being sold us as oil of thyme.

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Feb. 6, 1878.

THE USES OF SOME OF THE INDIAN SPECIES OF BASSIA.

BY JOHN R. JACKSON, A.L.S.,

Curator of Museums, Royal Gardens, Kew.

The characteristic properties of the Sapotaceæ are, as is well known, of an oleaginous nature, and this principle is, perhaps, more fully represented in the genus *Bassia* than in any other. The best known species is the shea butter tree which, though described by Don as *Bassia Parkii*, has by modern botanists been put in the genus *Butyrospermum*. It is an African tree and is well known on account of the accurate description which is recorded of it in Mungo Park's travels; the concrete oil he describes as being, when fresh, equal to good butter from cow's milk. The fat is extracted from the seeds by boiling. When fresh it is of a white colour and of a bland agreeable taste; with age, however, it turns yellowish and becomes somewhat rancid. It is much used by the people in the countries where the plant grows, and is an article of trade at Sierra Leone.

Three species of Bassia are well known in India: —*Bassia butyracea*, Roxb., *B. longifolia*, Willd., and *B. latifolia*, Roxb. The first is known as the Indian butter tree or "Phulwa," and grows to a height of from forty to fifty feet with a straight trunk five or six feet in circumference. A soft but solid white fat about the consistence of fine lard is extracted from the seeds by a system of bruising and pressing somewhat in the following manner:—After being beaten till they are about the thickness of cream the mass is put into a cloth bag, upon which a heavy weight is placed, and left to stand till all the oil or fat is expressed. This fat or butter has the reputation of being a valuable preservative for the hair, and when mixed with sweet scented oils is thus used by the native population and is also exported. Scented or perfumed with attar of rose or cloves it forms an ointment which has a great reputation in rheumatic and similar affections

The fat may be kept for a very long time without deteriorating, and when pure it is said to burn well with a bright light, without smoke or smell. It also makes excellent soap. The cake left after the expression of the oil is eaten as food. The pulp of the fruit has a sweet, insipid taste, but is nevertheless eaten by the people. A sweetish juice is sometimes extracted from the flowers and made into sugar, and sold in the bazaars, and is described as being very similar in all respects to date sugar. The flowers, unlike those of the other species, are not eaten.

Bassia longifolia, Willd., known as the "Illupi," is a tree growing to a height of some forty feet, and common in the forests of Western Mysore, Malabar, and the Circars. The seeds yield an oil in plenty, but of a quality inferior to that from the other species. It retains its solidity at a moderate temperature, but it is said to keep good in the warm season only for a fortnight or three weeks, when it becomes so rancid as to give off a very disagreeable smell. In cold weather, however, and if it is well secured from contact with the air, it will keep good for months. The oil cake or residue left after the expression of the oil is used for preparing a head wash. From the bark a viscid gummy juice exudes which was formerly used in rheumatic affections, and from the leaves was also obtained a similar juice. From the bark is prepared a decoction which is used as an astringent and emollient. The flowers themselves are roasted and eaten, and are also bruised and boiled till they form a jelly.

Bassia latifolia, Roxb., is perhaps the most important of the Indian species, not so much on account of the oil which it yields, as for the flowers. The tree is commonly known as the "Mahwa," and grows to a height of sixty feet, the trunk often measuring six to seven feet in circumference. Dr. Brandis, in his 'Forest Flora,' describes it as being cultivated, propagating itself by self-sown seedlings, and protected in most parts of India. In the Punjab it is grown in the sub-Himalayan tract and the outer valleys as far as the Ravi, but not commonly in the plains. It is abundant in all parts of Central India from Guzerat to Behar. There seems no doubt that the tree is indigenous in the forests of the Satpura range of Western India above Ghat, and perhaps also of Eastern Kumaon. It thrives in dry stony ground. The old leaves are shed gradually from February to April, the fresh leaves opening out immediately afterwards. The flowers generally appear before the new leaves, in March and April, and after the corollas have dropped the leaf buds above the flowers expand. The fruit is eaten both in the ripe and unripe states. The seeds contain a quantity of oil, which is obtained from them by expression. It is at first quite fluid, and of a greenish colour; but while it keeps limpid and sweet for a length of time in a cool climate, in the heat of India it soon turns rancid, assuming a bitterish taste and a brown colour, the heavy oil separating from the fluid portion and sinking to the bottom of the vessel. The cake, after the expression of the oil, is used to poison fish, and it is also used as an emetic. The smoke that arises from the burning of this oil cake is said to be fatal to rats and various insects. A gum exudes from the bark; and the wood, which is close and even grained, is sometimes used for railway sleepers. It is, however, for the flowers that the tree is most valued. These flowers are very fleshy or succulent, and fall from the trees in vast quantities during the night. They are eaten in very large quantities, both raw and cooked, sometimes with grain and sometimes as sweetmeats. They have a sickly sweetish taste, and a sweet, somewhat spirituous smell, more especially after being enclosed in a box or closed jar. Dr. Gibson writing, many years since, of this plant in Guzerat and Rajpootana says:—"This flower is collected in the hot season by Bheels and others from the forests, also from the planted trees which are most abundant in the more open parts of Guzerat and Rajwarra. The ripe flower has a sickly sweet taste resembling manna. Being very deciduous it is found in large quantities under the trees every morning during the season. A single tree will afford from 200 to 400 lbs. of flowers. The seeds afford a great quantity of concrete oil used in the manufacture of soap. The forest or Bheel population also store great quantities of the dried flowers as a staple article of food, and hence in expeditions undertaken for the punishment or subjection of those tribes when unruly, their bassia trees are threatened to be cut down by the invading force, and the threat most commonly ensures the submission of the tribes. In Guzerat and Rajpootana every village has its spirit shop for the sale of the distilled liquor from the flowers; in the island of Caranja, opposite to Bombay, the Government duty on the spirits distilled (chiefly from this flower) amounts to at least £60,000 per annum. I rather think that £80,000 is most generally the sum. The Parsees are the great distillers and sellers of it in all the country between Surat and Bombay, and they usually push their distilleries and shops into the heart of the forest which lines the eastern border and hills of those countries. The spirit produced from the bassia is, when carefully distilled, much like good Irish whisky, having a strong smoky and rather fetid flavour; this latter disappears with age. The fresh spirit is, owing to the quantity of aromatic or empyreumatic oil which it contains, very deleterious, and to the European troops stationed in Guzerat, some thirty years ago, appeared to be quite as poisonous as the worst new rum of the West Indies has generally proved to our soldiers. It excited immediately gastric irritation, and on this supervened the malarious fever so common in those countries."

It is remarkable that these flowers, so well known in India, should not before this have been introduced as a commercial article into this country. We understand, however, that experiments have been made with them quite recently in England, both in distilling and also for cattle feeding; in the former 6·16 gallons of proof spirit were obtained per cwt., and this spirit was of a very superior quality. For feeding cattle these flowers are also said to be very efficacious, the flesh of pigs and other animals fed upon them is said to be very much improved, and of a delicate flavour.

If these are facts that can be borne out by practice, and of this there seems no reason to doubt when it is known how abundant the trees are in India, and how prolific they are in flowering, there is apparently good cause to suppose that mahwa flowers may ere long become a recognized article of commerce, for we are reminded that the cost of production is almost *nil*, for they have only to be swept up from the ground and shovelled into sacks or boxes, when they are ready for immediate exportation. It is said that a bad mahwa harvest has never yet been known in India, so that there is the certainty of a constant and unlimited supply. The flowers will keep for almost any length of time, and considering the abundance of sugar they contain their application may yet be further developed. The principal cost would of course be in the freight, but if the importation were taken up in earnest new applications would soon develop themselves, and the uses we have mentioned would also be perfected.

NOTE UPON PAO-PEREIRO BARK.*

BY O. HESSE.

The presence of an alkaloid in Pereiro bark, also called Pingnaciba and Canudo amargoso, which in Brazil has a reputation as a febrifuge, was announced by Correa dos Santos, and its occurrence was confirmed by Goos† in 1838. Goos described it as amorphous, but subsequently Peretti‡ observed that it was capable of separating from ether or alcohol in granules, and consequently probably of crystallization. Bochefontaine and De Freitas§ have recently studied the action of this alkaloid upon different animals and found that it has considerable toxic power. In these experiments the alkaloid was used partly dissolved in water (!) and partly in alcohol. The latter authors also suggested that the name "pereirine" at present used for the alkaloid in question should be changed to "geissospermine," in order to recall the origin of the alkaloid. According to Peckholt the tree yielding pao-pereiro bark (not pao-pereir*a* as it is usually erroneously spelt) is the *Geissospermum Vellosii,* and according to Baillon the *Geissospermum læve*, consequently it is one of the Apocynaceæ.

I have myself also been engaged in the investigation of this subject, and last June I informed Professor Wiggers, to whom I was indebted for a considerable quantity of bark and leaves of pao-pereiro, that the bark contained several alkaloids, one of which was distinguished from the others by its difficult solubility in ether. This alkaloid I have named "geissospermine."

Geissospermine forms small white prisms, truncated at both ends. It dissolves readily in alcohol, but is nearly insoluble in water and in ether. It is freely soluble in dilute acids, and from such solutions it is again precipitated by an excess of ammonia or sodium hydrate. The precipitate at first consists of amorphous white flocks, which are quickly transformed into small crystals.

The hydrochloric solution of geissospermine gives with platinic chloride a pale yellow amorphous precipitate; with gold chloride it gives a brown yellow precipitate, no reduction of the metal taking place in this case.

Concentrated nitric acid dissolves geissospermine with a purple red colour, which at the ordinary temperature continues for a considerable time; but after heating the colour immediately disappears, passing into orange yellow. Pure concentrated sulphuric acid dissolves the alkaloid colourless; but after a few seconds the solution becomes bluish, afterwards blue, and at last again pale. Ordinary concentrated sulphuric or acid containing oxide of iron also dissolves the alkaloid with a more or less intense blue colour, which eventually becomes pale. Sulphuric acid containing molybdic acid on the other hand dissolves it with a dark blue colour which retains the same intensity as at first, even after twenty-four hours. Concentrated hydrochloric acid produces no colour reaction with geissospermine. When heated with a little soda lime, geissospermine yields a substance that sublimes in light yellow delicate scales, which are freely soluble in ether, and dissolve without colour in concentrated nitric acid, but with a beautiful blue colour in sulphuric acid containing molybdic acid.

The crystalline geissospermine contains water of crystallization which passes off at 100° C., the substance then becoming coloured faintly yellow. At a higher temperature the alkaloid becomes more coloured and melts at 160°, forming a brown liquid that solidifies amorphous upon cooling.

The alkaloid deviates the plane of polarized light to the left; amounting for the hydrate dissolved in 97 per cent. alcohol, with $p=1{\cdot}5$ and $t=15°$ C. to $(\alpha)_D = -93{\cdot}37°$.

Finally, the formula of anhydrous geissospermine, dried at 100° C., is $C_{19}H_{24}N_2O_2$; that of the hydrate, or the crystalline air-dried alkaloid is $C_{19}H_{24}N_2O_2 + H_2O$; and that of the platinum salt dried at 130° C. is $(C_{19}H_{24}N_2O_2 \cdot HCl)_2 + PtCl_4$.

A second alkaloid from pereiro bark forms a greyish white amorphous powder, very easily soluble in ether. It is coloured blood red by concentrated nitric acid, and violet red by pure sulphuric acid. It corresponds best with the notices of Goos and others respecting pereirine, which name should therefore be retained for it. This alkaloid is apparently contained in the bark in preponderating proportions.

I intend further to investigate both these alkaloids and especially to ascertain whether they are contained in the leaves of pao-pereiro, which Wiggers has received from Rio Janeiro, under the name of Folia Carobæ.

* Read before the Berlin Chemical Society (*Berichte*, vol. x., 2162).

† *Repertorium f. Pharm.*, lxxvi., 32.

‡ *Journ. Chim. Méd.*, xxvi., 162.

§ *Comptes Rendus*, lxxxv., 412; *Pharm. Journ.* [3], viii., 182

HANDY ANTIDOTES.*

The French medical profession have frequently occupied themselves with the endeavour to add to their pharmacopœia an antidote which would answer the purpose in the majority of accidental poisonings, and which could always be kept at hand, so that it might be administered at once, before more special indications had the time to develop themselves, either according to information and anamnestics, which are often wanting in cases of accident, or according to symptoms noted by observation of the patient. M. Mialhe has highly recommended, for this purpose, hydrated sulphate of iron mixed with calcined magnesia. This is a good antidote for the metallic salts, which it deoxidizes and changes into harmless sulphurets. But this antidote has the disadvantage of disengaging sulphydric acid in the presence of acids. It requires great nicety in preparation, and is difficult to keep. M. Dorvault has proposed, in cases of alkaloid, cyanic, and metallic poisonings, an antidote composed of equal parts of calcined magnesia, peroxide of iron, and washed powder of animal charcoal. This mixture also, however, changes if it be kept some time. M. Jeannel proposes to keep separately—1, a solution of sulphate of iron; and 2, a mixture of 80 grams of calcined magnesia and 40 grams of animal charcoal in 800 grams of distilled water. This mixture, added at the moment of using to the solution No. 1, forms the antidote, which is to be administered in successive doses of from 50 to 100 grams (about 1¾ to 3½ ounces). This antidote renders preparations of arsenic, zinc, and digitalis insoluble. It completely saturates free acid, and only acts partially on the alkaline hypochlorites and the oxide of copper. It also leaves in solution a small amount of morphia and strychnia, and the oxide of mercury in notable quantity. Professor Ranieri Bellini has made a communication to the Medico-Physical Society of Florence on the iodide of starch, which MM. Bouchardat and Quesneville were the first to introduce into therapeutics, and frequently employed in cases which required an active alterative medication, when the stomach refused to tolerate iodine in any other form. The iodide of starch is a chemical antidote which is specially appropriate to poisoning by sulphur, by the alkaline or earthy sulphurets, by caustic alkalies, ammonia, or any of the

* From *The British Medical Journal* for December 22, 1877.

alkaloids. It is also an eliminating agent, very useful in the treatment of long-standing metallic poisonings, especially those resulting from lead or mercury. Dr. Bellini advises that the patient should always be made to vomit soon after the administration of the antidote, to rid him of the chemical products which result from the decomposition of the toxic agent, which in their turn might likewise become decomposed.

THE CHARACTERS OF CONICINE.*

BY A. PETIT.

The author having had occasion to prepare a large quantity of conicine according to the process of the Codex has taken the opportunity of studying the properties of this alkaloid. The results that he has obtained as to the boiling-point, density, and rotatory power differ considerably from those of other authors. He has also arrived at the conclusion that the rotatory power cannot be depended upon as an indication of the purity of the alkaloid, or of the degree of dilution when it is diluted. Commercial conicine is not as a rule diluted except by a mixture of water and alcohol. Specimens examined contained only slight traces of methyl-conicine; whilst the rotatory power of conhydrine differs but little from that of conicine.

The product from a large operation was distilled in a current of hydrogen. Three liquids were separated: (A) passing over between 130° and 140° C.; (B) passing over between 160° and 170°; and (C), the greater portion, passing over at 170°. The operation was stopped at 172° at which point conhydrine began to distil over. The third portion (C), consisted of pure conicine, the hydrochlorate and sulphate giving very closely the theoretical quantity of chlorine and sulphuric acid respectively; it was therefore used in the subsequent experiments.

The boiling point of pure conicine, at the ordinary pressure, according to the author, is 170° C. Other experimenters have attributed to it figures ranging between 136·5° (Wertheim); and 212° C. (Ortigosa), the latter being the boiling point given in the Codex and by most authors. Blyth, however, has placed it between 168° and 171° C.

The density attributed to conicine by Gerhardt, Pelouze, and Wurtz was 0·878, and by Berthelot and Dragendorff 0·89. The following were the results obtained by the author, operating at a temperature of 12° C.:—

Product A	0·869.
„ B	0·850.
„ C (pure conicine) . . .	0·846.

Examined with the sodium light the rotatory power of pure conicine freshly prepared was found to equal +20·7°; but after keeping the preparation eight days this had diminished to equal +10·36. Chloroform, used as a solvent, diminished the rotatory power of conicine, but to a much less degree than alcohol. Ether, oil, and benzol are without action in this respect.

Pure conicine (product C) can be preserved a long time without alteration. Combined directly with hydrobromic acid or hydrochloric acid it forms with the greatest facility very stable salts that remain unaltered at 100° C. or even 120° C. The best method of preparing them is to employ the conicine distilled in a current of hydrogen and colourless, and add to it a very slight excess of hydrobromic or hydrochloric acid. Upon evaporating slowly over a water-bath, fine perfectly white crystals of the hydrobromate or hydrochlorate are obtained. The insoluble modification of hybrobromate of conicine, noticed by Mourrut as being formed when the temperature was raised above 60°, was not observed by the author to more than a most trifling extent. Crystals of hydrobromate of conicine dissolved in distilled water formed a clear colourless solution, which when heated during half an hour to 100° gave no precipitate. Both the hydrobromate and the hydrochlorate of conicine are anhydrous.

The hydrobromate of conicine is soluble in two parts of water, the hydrochlorate is a little more soluble. The hydrobromate is soluble in two parts of alcohol, and the hydrochlorate in three parts.

A specimen of conicine obtained from a German source was found by the author to agree with pure conicine prepared by himself as to the boiling point and density, but differed considerably in rotatory power, which equalled +15·79°. The author suggests whether this variation between +10·36° and +15·79° in the rotatory power of substances, presenting otherwise identical characters, may not be indicative that conicine extracted from conium fruit is a mixture in variable proportions of conicine active and inactive upon polarized light.

* *Journal de Pharmacie* [4], vol. xxvi. p. 200.

COLCHICUM AND ITS PREPARATIONS.*

BY DR. FRANZ MOLS, PHARMACEUTIST.

There is perhaps not a single drug that has played so conspicuous a part in materia medica as *Colchicum autumnale* (*meadow saffron, Herbst Zeitlose*) and its various preparations, such as extractum colchici aceticum, extractum colchici seminis fluidum, extractum colchici radicis fluidum, tinctura colchici seminis, tinctura colchici radicis, acetum colchici.

To this list has most recently been added *colchicine*, but it has not proved a great favourite in therapeutic practice on account of its exceedingly dangerous application, and physicians have turned to new preparations, such as iodide of potassium, propylamine, and salicylic acid, in order to overcome certain diseases in which preparations of colchicum had formerly been used. Many practitioners have abandoned these newer preparations and have returned to colchicum, but frequently have arrived at no satisfactory results therefrom.

The main cause of these unsatisfactory results of the use of colchicum in medical practice is twofold, and may be looked for partly in the unfitness of the raw material used in pharmaceutical laboratories, and on the other hand in the manner of its preparation, and this latter defect, again, caused by impractical formulas in most of the pharmacopœias as well as the thoughtless following of the same by the preparing pharmaceutists themselves.

The most effective constituent principle of *Colchicum autumnale* is without doubt found in the alkaloid—colchicine—and this is said without denying all the effectiveness of the extractive substances which are soluble in water.

According to the assertions of the most prominent chemists of our time it has been established that the seed of the colchicum, after it is over a year old, contains very little, if any, colchicine, and this is the case with the root or bulb after having been gathered a few months. The last editions of the 'Pharmacopœia Borussica' as well as the 'Pharmacopœa Germanica' permit only the use of colchicum seed which is not over a year old.

Now it will be admitted by any practical pharmaceutist that the supply of several pounds of colchicum seed, which always has been taken from a wholesale house, is sufficient to make all preparations of colchicum for several years, even in a thriving business, and it may be safely stated that the colchicum bulb or seed found in most of the drug stores contains no colchicine at all. The other causes of the real ineffectiveness of these preparations are some of the formulas of the pharmacopœias. According to the researches of the most prominent chemists of our time who have made the preparation of colchicine a specialty, such as Huebler, Aschoff, Bley, Pfeiffer, Maisch, Walz, Schoenbroodt, Burmeister, and Geiger, colchicine is extractible from the root or seed of colchicum *only by the medium of heated or acidiferous alcohol of* 90 *per cent.*, while the pharmacopœias invariably dictate *diluted* alcohol, and in the cases of vinous preparations prescribe it *more diluted* yet. By such method it is impossible to gain any colchicine, even if the natural raw material used really contained it.

* From the *Druggists' Advertiser* for January.

In order to meet this dilemma, I have taken pains, first, to be in receipt every fall of a fresh consignment of colchicum seeds; and, secondly, I have prepared a formula, according to which a preparation may be made which contains all and every effective particle in the colchicum. This preparation is available alike to the physician and the druggist, because it is in the shape of a *fluid extract,* and therefore applicable to the preparation of the tincture as well as the wine.

I have the colchicum seed gathered in Germany (on the banks of the Neckar near Heidelberg) in the month of July, have it slightly dried, sprinkled with alcohol, and then sent to me in hermetically sealed packages.

I here give my manner of preparation :

Colchicum seed, which has been gathered in July, is first dried, then ground, and moistened with alcohol of 90 per cent. After twenty-four hours digest for further twenty-four hours on a steam-bath with 90 per cent. alcohol four times the weight of the seed used. (This procedure is best done in the still of Wolff's or Mohr's steam distilling apparatus, whereby the over-distilled alcohol may be saved and returned in to the still). When cold strain the contents of the alembic through linen and distil off the liquid until there remains but one-half the weight of the seeds originally used, and place aside.

Macerate the strained seed again, but this time with hot distilled water, during twenty-four hours, pack it in a glass percolator and exhaust with hot distilled water as long as the liquid retains a bitter taste; then evaporate by the steam-bath until but half of the original weight of the seeds used remains. Then mix both extracts—the alcoholic with the aqueous—and keep the product four or five days in narrow vessels (for which I find tall and narrow glass bottles are best adapted). The dark green oil (*Oleum Colchici seminis pingue*), which was dissolved in the alcohol, will have accumulated on top, and is to be removed by decantation.

For this fat green oil there has not been found any use as yet. One troy ounce of this fluid extract represents one troy ounce of colchicum seed.

I have convinced myself of the presence of colchicine in an extract prepared as above, as I gained 15 grains of colchicine from a pound of extract, while with even the greatest possible accuracy in analysis I could not detect the least trace of colchicine in five samples of extract that I had procured from several large establishments of so-called respectable manufacturing chemists.

THE NUTRITION OF DROSERA.

An objection is frequently raised to the modern view of the "carnivorous" habits of the sundew and of some other plants, on the ground that they do not benefit by this habit, but appear to carry on quite as healthy and vigorous an existence when deprived of this source of food. According to the Darwinian theory of natural selection no habit can be acquired by an organism unless it is of some benefit to it. In a paper recently read before the Linnean Society, Mr. Francis Darwin pointed out that the statements that animal food supplied to the leaves of *Drosera* is not advantageous to it, rest on vague or unreliable data, and he described a series of careful and elaborate experiments, from which he appears to have proved that it is distinctly advantageous.

For this purpose about 200 plants of *Drosera rotundifolia* were transplanted on June 12th, 1877, and cultivated in soup-plates filled with moss during the rest of the summer. Each plate was divided in half by a low wooden partition, the plants on one side of the partition being fed by supplying each leaf with one or two bits of roast meat, each weighing about $\frac{1}{50}$ grain, while the plants in the other half were "starved." The feeding was performed at intervals of a few days from the beginning of July till the early part of September. The benefit of the feeding on the plants in one half of each plate was soon apparent. By July 17th the leaves were evidently of a brighter green, showing that the increased supply of nitrogen had allowed a more active formation of chlorophyll grains to take place; and from this time the flower stems on these plants were distinctly taller and stouter. On August 7, the ratio between the number of "starved" and "fed" flower-stems was as 100 to 149·1, and by the middle of August the proportion of leaves on the two sides was as 100 to 136·9. At the beginning of September, the seeds being ripe, all the flower stems were gathered, and the following comparisons were arrived at as the result of counting, measuring, and weighing the various parts of the two sets of plants :—

Ratio between the number of starved and fed plants	as 100 to	101·2
Ratio between the weights of the plants exclusive of flower-stems . . .	as 100 to	121·5
Total number of flower-stems . .	„	164·9
Sum of the heights of the flower-stems	„	159·9
Total weight of flower-stems. . .	„	231·9
Total number of capsules	„	194·4
Average number of seeds per capsule	„	122·7
Average weight per seed	„	157·3
Total calculated number of seeds produced	„	241·5
Total calculated weight of seeds produced	„	379·7

The most important feature in the general result is that the advantage gained by the fed plants is far more conspicuously shown in all that relates to the seeds and flower-stems, than in any other part. Thus, the ratio between the weights of the plants, exclusive of flower-stems, is as 100 to 121·5; while the weights of the flower-stems, including seeds and capsules, were in the proportion of 100 to 231·9. The highest ratio is seen to be between the total weights of seeds produced, viz., 100 to 379·7; and this is intelligible, says Mr. Darwin, because a source of nitrogen is laid by in the albuminous seeds. Another point is that the difference between the starved and fed plants is more clearly shown in the comparison of weights than in that of numbers or heights. It is clear that increase of weight is a better proof of increased assimilation than any other character.

It may fairly be said that the above experiments prove beyond a doubt that insectivorous plants are largely benefited by a supply of animal food, and it can no longer be doubted that a similar benefit is gained in a state of nature by the capture of insects.

SELF-FERTILIZATION OF PLANTS.

At a recent meeting of the Linnean Society, the Rev. G. Henslow gave an account of a series of experiments on this subject, the results of which are not altogether in harmony with those at which Mr. Darwin has arrived. These results may be summed up, according to Mr. Henslow, in the following statements :—1. The majority of flowering plants are self-fertile. 2. Very few are known to be physiologically self-sterile. 3. Many are morphologically self-sterile. 4. Self-sterile plants become self-fertile by (*a*) withering of the corolla, (*b*) its excision, (*c*) loss of colour, (*d*) closing, (*e*) not opening, (*f*) absence of insects, (*g*) reduction of temperature, (*h*) transportation. 5. Highly self-fertile flowers may arise under cultivation. 6. Special adaptations occur for self-fertilization. 7. Inconspicuous flowers are highly self-fertile. 8. Cleistogamous flowers are always self-fertilized. 9. Conservation of energy in the reduction of pollen. 10. Relative fertility may equal or surpass that of crossed plants. 11. It does not decrease in successive generations. 12. It may increase. 13. Free from competition, self-fertilized plants equal the intercrossed, (*a*) as seedlings, (*b*) planted in open ground. 14. They may gain no benefit from a cross from the same or a different stock. 15. They are as healthy as the intercrossed. 16. They may be much more productive than flowers dependent upon insects. 17. Naturalized abroad, they gain great vigour. 18. They are under these circumstances the fitter to survive in the struggle for life.

The Pharmaceutical Journal.

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Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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THE REGISTRAR'S STATISTICS.

AT the meeting of the Council last week, the Registrar presented his usual statistical report on the Register of Chemists and Druggists and the numerical strength of the Society, by which we are enabled once more to take a brief glance at the relations they bear to each other and to those of former years. The subject-matter of that portion of the Registrar's report which is included under the heading "Analysis of Examinations" has already been dealt with in our recent review of the past year, and therefore calls for no further notice here beyond the remark that the fuller details now presented disclose an apparent incompatibility in the results obtained by the two Boards which is occupying the attention of the Council.

The number of persons who passed the Minor examination last year and thus became qualified for registration as chemists and druggists was 299. To these must be added 15 persons who passed the Modified examination and no less than 34 who have been registered upon payment of the registration fee, after having given statutory evidence that they were in business on their own account before the date of the passing of the Pharmacy Act, 1868, and 27 whose names have been restored to the Register. These make a gross total of 375. On the other hand there have been 230 erasures from deaths and 3 from other causes. The net result is that the Register for 1878 will contain 13,320 names, or 142 more than that for 1877. Probably, however, these figures give the increase in a somewhat exaggerated form, and that it is more truly shown by the difference between the number of persons passing the qualifying examinations, 314, and the number of erasures, 233. The other principal source of increase is accidental and must soon become exhausted. Moreover, if we may judge from past experience, which has proved that the Register becomes cumbered at the rate of about 100 a year with names that require erasure, but concerning which information has not yet reached the Registrar, some allowance requires to be made in this respect. It is evident therefore that for a more exact estimate of the relative strength of the Register we must wait until the Registrar finds another opportunity for the exercise of his expurgatory powers.

Before leaving the subject of the Register we may remark that on the same day the Registrar presented another series of statistics relating to the Benevolent Fund. From these we gather the surprising fact that although a subscription of 2*s.* 6*d.* now entitles the giver to a vote at the next election of annuitants, only 2189, or a little more than 16 per cent., of the 13,320 persons on the register of chemists and druggists subscribe to the Fund.

In the comparative statement of the numerical strength of the Society we have satisfactory evidence that, notwithstanding certain vaticinations, the Pharmaceutical Society continues to make a steady advance, the number of registered chemists and druggists who now belong to it as Members or Associates being 4510, or more than at any previous time, and 89 in excess of the number stated in the report last year. It is true that there has been a decrease in two important classes, and the decrease in the class of pharmaceutical chemists has been the subject of deserved regret. But, as has before been pointed out, until the stage has been arrived at where the number of candidates passing the Major examination equals the number of deaths of unexamined as well as examined men on the Register of Pharmaceutical Chemists, decrease must be expected. During the past year it has amounted to 14 on the entire Register, while the decrease in the number of pharmaceutical members of the Society is nearly as many again, viz., 27; but this difference may find a partial explanation in the fact that naturally the death rate becomes relatively greater year by year among the unexamined men, who must have all been placed on the register before 1853, or a quarter of a century since, and that these are all members of the Pharmaceutical Society. Nevertheless, whilst recognizing these causes that necessarily affect the numbers unfavourably, all who have the interests of British pharmacy at heart will hope they are temporary, and would be glad to know that sufficient men were passing the Major to keep the Register up to at least its present standard. With regard to the chemist and druggist members of the Society it was pointed out last year that probably the turning point had been reached, and that from that time the numbers would diminish. This expectation has been verified in a decrease of 9, and it is evident that this must go on in a gradually increasing ratio.

When we come to the two classes of Associates, however, the facts are of a very different order, the return showing that there were 108 Associates in Business and 18 Associates not in business more at the end of 1877 than there were at the end of 1876. From these figures it would appear that a number of persons equal to, if not exceeding, the total number entering the business by passing the Minor examination have joined the Pharmaceutical Society during the year just past.

Another interesting feature of the report, and one of good omen for the future of the Society, is that there has again been a very large increase, amounting to 120, in the apprentices or students of the Society, this class now numbering 1054.

According to our usual practice we throw these figures into a tabular form, in order that they may be conveniently compared with those of former years:—

	1877.		1878.	
	No.	Per cent. of whole.	No.	Per cent. of whole.
Pharmaceutical Chemists, Members of the Society	2062	88·84	2035	88·21
Other Registered Chemists and Druggists connected with the Pharmaceutical Society	2359	—	2475	—
Total Number of Registered Chemists and Druggists connected with the Pharmaceutical Society	4421	33·55	4510	33·86
Registered Apprentices subscribing to the Society	934	—	1054	—

THE NEW READING OF THE SALE OF FOOD AND DRUGS ACT.

In the House of Commons, on Tuesday, Mr. Anderson called attention to a recent decision of the High Court of Justiciary, Scotland, to the effect that the adulteration of an article of food or drink purchased for the purpose of analysis under the Sale of Food and Drugs Act is not to the prejudice of the purchaser, and asked the President of the Local Government Board whether he purposed taking any steps to prevent the Act becoming a dead letter. It has also been held by two Scotch judges that the sixth section does not prevent tampering with an article to the deterioration of its quality, if without the addition of extraneous matter. The President of the Local Government Board replied that in all cases in England where this objection had been raised it had been overruled, a view in which he himself concurred, and he could not believe that the High Court of Justice, if appealed to, would come to any other decision. He did not think it necessary, therefore, to introduce an amending Bill at present.

CHLORAL HYDRATE.

It would appear from a report on another page that a coroner's jury, through its ignorance—which was shared by the coroner and the medical witness—of the fact that chloral hydrate is now included in the schedule of poisons, has decided to forward a memorial on the subject to the Board of Trade. It appears very desirable that such anachronisms should be avoided by the Home Office making coroners acquainted with any alterations that may take place in the poison schedule. The Pharmaceutical Society is at least doing its part, at a considerable expense, in forwarding information to every chemist and druggist on the Register of the recent addition of chloral hydrate to the schedule.

TOXICOLOGY IN THE POLICE FORCE.

A Coroner's inquest in a case of alleged poisoning is referred to on p. 661, which, as the report at present stands, seems to have resulted in a most unsatisfactory verdict. A woman of dissolute habits died rather suddenly; a bottle that had contained tincture of iodine, supplied to her for outward application, being found upon her empty, the inference drawn was that she had swallowed the tincture, although nothing is said of any discoloration of the mouth being noticed or any symptom that would be expected to follow the ingestion of an overdose of iodine. Add to this that a policeman stated in evidence that a drachm of tincture of iodine was more than sufficient to cause death, and apparently without any other medical evidence or *post mortem* examination, a Staffordshire jury saw sufficient to warrant it in returning a verdict of death from poisoning by iodine. Now a drachm of tincture of iodine, B.P., contains about $1\frac{1}{3}$ grains of iodine, and half as much potassium iodide. This quantity is considerably in excess of the official dose, and may or may not be sufficient to cause death if swallowed, but we think medical evidence should have been required upon this point and as to the symptoms that might have been expected. Certainly the decision should not have depended upon the *ipse dixit* of a police constable. It may be mentioned that Taylor, in his work 'On Poisons,' only quotes two cases of poisoning by iodine, the smaller dose having been half a drachm dissolved in an ounce of spirit, and in that case the patient recovered.

PROFESSOR REDWOOD'S LECTURE.

We would remind our readers that at a Special Evening Meeting of the Pharmaceutical Society, to be held on Wednesday next, Professor Redwood will deliver a lecture on "Spectrum Analysis," and in doing so we take the opportunity of saying that the lecture will not be a repetition of that delivered last year by the learned Professor on the same subject, but a continuation of it. As on the previous occasion the lecture will be illustrated with the electric light.

We understand that in order to give the members of the Chemists' Assistants' Association an opportunity of attending this lecture, no meeting of that Association will be held on Wednesday next.

BRISTOL PHARMACEUTICAL ASSOCIATION.

It has been arranged that the following lectures shall be delivered in connection with the above Association, at the Museum and Library, Queen's Road. On Monday evening, February 18th, on "The Artificial Production of Cold," by Mr. S. P. Thompson, of University College, Bristol, and on Friday, March 29th, on "Specific Gravity and its Applications in Pharmacy," by Mr. W. W. Stoddart.

Provincial Transactions.

OLDHAM CHEMISTS AND DRUGGISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The annual meeting of the above Association was held in the room at the Church Institute, on the 29th ult.; Mr. Wood, President, in the chair.

After the usual preliminary business, the Honorary Secretary, Mr. J. Naylor, read his report for the past year. He said he was glad to be able to state that the Association had been gradually improving, and had therefore attained a higher state of perfection since he presented his last annual report. This statement he was sure could not fail to give general satisfaction. In speaking of the improvement he alluded not only to the financial position of the Association, but also to the increase of ordinary members; on the other hand, he regretted to have to state that there had been a slight decrease in the number of honorary members, owing chiefly to changes in the drug business; the Association had also become possessed of additional books during the year (for which it was indebted to the Pharmaceutical Society for a grant of money), thereby rendering it replete with every requirement for pharmaceutical students as regards books, botanical specimens, specimens of the British Pharmacopœia and chemical apparatus for experimental purposes. The Association was also greatly indebted to the Pharmaceutical Society for the weekly issue of the Journal, also to Professor Attfield of the Pharmaceutical Conference, for the 'Year-Book of Pharmacy.' Lectures, essays, papers, etc., have been given on the following subjects:—"Theoretical Review of the British Pharmacopœia," "Practical Review of the British Pharmacopœia," "The Acids," "Dispensing Chemicals," "The Gases," and "The Laws of Chemistry and the Atomic Weights," by Mr. Wood; "Trade, Past and Present," and "Natural Facts," by Mr. Hurst; "Sciences, and a few Scientific Men," and "The Use of Tobacco," by Mr. Naylor; "Pharmacopœial Preparations," and "Silver," by Mr. Critchlow; "Purgatives," by Mr. Thatcher; and "The Natural Orders of Plants," by Mr. Jones. In addition to these, numerous examinations have been conducted and private classes held. In concluding, he remarked that the Association had suffered a rather severe blow during the last year in losing its late President, Mr. Taylor, who for a considerable number of years presided over the Association, during which time his manner towards the members bore the unmistakeable impress of a kindly feeling, with a strong desire to see the business of the Association carried to a successful issue; he trusted this essential quality might be the predominating one with the present members, and that by working harmoniously and energetically together the Association might attain a position surpassed by none.

The Treasurer, Mr. Hurst, then made his financial statement, which showed the Association to be in a most satisfactory position, it having a surplus of £7 1*s.* 8*d.* in hand, including a part of the Pharmaceutical Society's grant; the latter to be expended in books.

A hearty vote of thanks having been awarded to the retiring officers, the election of officers for the ensuing year was proceeded with, which resulted as follows;—President, Mr. J. Wood; Vice-President, Mr. Critchlow; Treasurer, Mr. T. G. Hunt; Librarian and Curator, Mr. R. Thatcher; Hon. Secretary, Mr. J. Naylor.

The President then delivered his inaugural address as follows:—

Gentlemen,—Allow me to thank you for the honour you have conferred upon me this evening in electing me President of this Association. It affords me great pleasure when I look back to the time of my election last year, and this evening you have shown to me your unabated confidence. I also tender to you my warmest thanks for having chosen me as the head of your various classes, and I am sure it will afford me very great pleasure to give you any assistance I can in the future. Allow me to congratulate you on the financial position of the Association, as I can say with certainty that it has never been in such a prosperous state as at present. I must also state that this Association has been of immense value, both to the masters, assistants, and apprentices of Oldham. I may say to those who do not know the history of the Association, and I believe I am the only one left who took part in it at the commencement, that there have been many difficulties to surmount. It has also been a great benefit to us as regards early closing, as we have through this Association succeeded in getting eight hours per week less. Another advantage is the one offered to students preparing for the various pharmaceutical examinations, and I do candidly say that if a student got a fair examination he would be able to pass without going through a course of study in London. We have also the opportunity of meeting together for social intercourse respecting business matters and the best mode of making our various preparations. It may also be interesting to new members to give a short account of its early life. First, there was an advertisement inserted in the Oldham papers calling a meeting of assistants and apprentices at the Waverley Temperance Hotel, for the purpose of taking into consideration the formation of an Association, at which officers were elected, and a deputation appointed to wait upon the masters, asking them to close their shops at 8·30 p.m., and Saturdays at 11 o'clock. We afterwards removed to two other temperance hotels, and the year following we went to the room of the Young Men's Christian Association, but only for a short time. A Latin class was then commenced, and continued for a time at the Lyceum, under the mastership of the Rev. A. Peaton. After a time we had, however, to give this room up in consequence of it being let to the School Board. During this time we received presents from the various wholesale drug houses. Afterwards we had a room in this Institute for one night a week, which lasted only for a short period, when the Association collapsed. In about two and a half years afterwards it was re-organized, the meetings being held once a week in the same room for nearly twelve months; thereupon the members determined to have a room for their entire use, which by their united efforts they succeeded in getting, it being the one we are now in, and I may also say, with all deference to the present members, that during the last year we lost two of our best members, namely, Messrs. Taylor and Burrows. After giving you this short history you will see that we have had to struggle hard. And now let me beg of you all in the forthcoming year to pay more attention than during the last, and also to press on you to give your minds to the different branches of study required, for which we have now every convenience, and the pharmaceutical examinations do certainly get more difficult every year, therefore it requires all our spare time to prepare for them. I, myself, think the examinations too severe for chemists in this part; they may suit the London chemists. Look, for instance, at the number of hours we have to be in the shop every week, no less than seventy-six hours, and then to commence studying for an examination; it is most unreasonable. My opinion is that we should have a board of examiners who understand what a drug business is in these large manufacturing towns. I should think, I may say, without fear of contradiction, that most of the important chemists in London get as many prescriptions in a day as all the chemists in Oldham get in a week. It would afford me very great pleasure to see a board of examiners in Manchester. I trust this may be taken up by the chemists of the district.

A hearty vote of thanks to the President for his address brought the meeting to a close.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The annual supper of the members of this Association was held at the Flying Horse Hotel, on Tuesday evening, January 29th, when thirty gentlemen sat down to an excellent repast. In the absence of the President, Mr. J. H. Atherton, F.C.S., through indisposition, the chair was ably occupied by the Vice-President, Mr. R. Fitz-Hugh, F.C.S., who was supported by the Treasurer, Mr. Rayner, and the Hon. Secretary, Mr. R. Jackson, and most of the members of the council.

After the usual loyal toasts had been given from the chair and duly honoured, Mr. Rayner proposed in complimentary terms, "The Pharmaceutical Society," which was heartily drunk, great regret being felt that the President was not able to be present and respond as usual to the toast.

Mr. Rivers Langton then proposed the toast of the evening, "Success to the Nottingham and Notts Chemists' Association." He eulogized the educational work of such associations, and spoke of the great benefit they were to members of the trade generally in promoting friendly feelings and rubbing off rough corners. He concluded by coupling with the toast the name of the Vice-President, who responded and mentioned with great satisfaction the testimony which had been borne to the value of the Association by some of the former students, who were now conducting some improvement classes for the benefit of the associates.

Mr. Warriner next proposed "The Medical Profession," which was responded to by Dr. Lill, who assured the company that the great majority of medical men did not wish at all to interfere with the chemists in the legitimate exercise of counter prescribing, but only wished to put a stop to chemists treating patients in serious cases.

Mr. Pearson then proposed "The Executive," and eulogized the officers and council for the energetic and hearty way in which they worked for the Association; he coupled with the toast the names of Treasurer and Secretary, who both suitably responded. The remaining toasts were "The Visitors," proposed by Mr. Bolton and responded to by Mr. J. J. Harvey; "The Vice Chairman," by Mr. W. H. Parker, acknowledged by Mr. J. Lewis; and "The Ladies," proposed by Mr. Ward, and responded to by Mr. W. Widdowson. The proceedings were agreeably diversified by a capital selection of songs and duets, with some choice music, and a very pleasant evening was spent.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The fourth meeting of the session was held in Anderson's College, on Wednesday evening, 30th ult. Mr. Kinninmont (Ex-Vice-President), in absence of the President and Vice-President, occupied the chair.

After the minutes of the last meeting had been read, Mr. Dougald Clerk, F.C.S., late of Anderson's College, was introduced, and delivered a lecture on "Continuity in Chemical Action," which was very fully illustrated throughout with experiments.

Continuity in Chemical Action.

In the chemical world there exists at present a growing antipathy to the atomic theory and its explanations of chemical phenomena. This antipathy may be traced, I think, to the abuse of that theory by its most ardent supporters, in the construction of that vast superstructure of so-called graphic formulæ, which serves principally to bewilder students and give false notions of the accuracy of our knowledge regarding the compounds whose *constitution* they are supposed to represent. The workers in organic chemistry are more especially to blame for this. In the ardent desire to discover new bodies, they have gone on adding compound after compound until now chemists are saddled with a host, where units may be reckoned in scores of thousands, and of this host our knowledge is but fragmentary; of each member the discoverer has probably determined the boiling point, the vapour density, and the percentage composition by ultimate analyses; a few of its reactions in most cases complete the test. Now it seems to me that although our knowledge is certainly extended in one way by this method of work, yet it would be more to the advantage of chemical science if fewer new compounds were formed and greater attention paid to the examination, thorough and accurate, of those compounds with which we are already acquainted. Chemistry is still very far behind the physical sciences in this, that in other sciences, given certain conditions, and the event may be predicted. So little, however, is known of the laws of chemical action, that we cannot as yet predict the result of any given action between bodies with which we are quite familiar. Very early in the history of the science efforts have been made to formulate chemical affinities; in the older books in the science, you have all observed tables of affinity, in which the supposed relations of a series of elements to one element with which they all combine is shown; these relations held for but a short time, new discoveries proved given actions capable of complete reversal under changed conditions. To take an example, I have here solutions of silver, mercurous, cupric and plumbic nitrates. Into the first solution I introduce metallic mercury, second copper, to the others in their order, lead and zinc, the result being, as you see, the precipitation of metals contained in solution, and the partial solution of the free metal added. Now at one time, these reactions would be supposed to prove that the affinity of mercury, copper, lead and zinc, for the acid radicle, was greater than that of the metals existing in solution; but Dr. Odling* has shown that in all these cases with the exception of the last, the order of precipitation may be reversed.

Tables of affinity, constructed in this way, cannot express completely the relations of the combining bodies.

Berthelot very early recognized the necessity of knowing more of a chemical change than its ultimate result; he enunciated a law which, from *à priori* reasonings, he supposed to regulate chemical combinations, but his researches were not experimental, and his law does not express correctly what occurs in any chemical action.

Gladstone's investigation "On Circumstances modifying the Action of Chemical Affinity" (*Phil. Trans.*, 1855, p. 179) was the first noteworthy step in the direction of definite study of the conditions of a chemical reaction. He succeeded in proving that in some cases alteration in the relative masses of the acting bodies causes proportionate change in the chemical action taking place. From 1855 to the present time many investigators have wrought at this subject, among whom may be mentioned Bunsen, Debus, Harcourt and Essen, Brodie, Berthelot, Guldberg and Wage, etc.; it is my object to-night to examine their results and place before you as briefly as possible the methods of investigation. Let us begin with Gladstone. When certain ferric salts in aqueous solution are brought in contact with potassic sulphocyanide, ferric sulphocyanide is formed of a deep blood red colour, in the case of ferric chloride

$$Fe_2Cl_6 + 6KCNS = 6KCl + Fe_26CNS$$

this reaction would occur if the double decomposition were complete. But Gladstone found that when one equivalent of potassic sulphocyanide was added to one equivalent of ferric salt, the double decomposition was not complete; instead of one equivalent of ferric sulphocyanide being formed, in no case did the amount equal ·2 equivalent, but that on further addition of sulphocyanide of potash, the colour went on increasing, and was still perceptibly increasing with the addition of the 700th equivalent. By preparing a standard solution of ferric sulphocyanide, and comparing the colour produced by successive

* "On the Reciprocal Precipitation of the Metals."—Odling, *Chem. Soc. Journal*, vol. ix., 144.

additions of alkaline sulphocyanide to a solution containing a known amount of ferric salt, Gladstone was able to trace the amount of ferric sulphocyanide, formed by each successive addition. He found this increase to be perfectly continuous, and capable of being represented by a curve, but he was unable to enunciate any law governing this change. Many similar reactions were examined, among others, that of hydrochloric acid and cupric sulphate. An aqueous solution of cupric sulphate is blue, and on the addition of hydrochloric acid, it becomes green, showing the formation of cupric chloride; this green colour increases in depth with the amount of hydrochloric acid added. When to a solution of ferrous sulphate is added tannic acid, ferrous tannate is formed of a black colour; increase of tannic acid or of ferrous sulphate produces increasing depth of tint; the red solution of auric bromide when treated with sodic chloride becomes yellow, showing formation of auric chloride. All these reactions, Gladstone found to behave in the same manner as that first mentioned. It was then considered proved, that when any two salts are brought together in aqueous solution, which do not form any insoluble salt by double decomposition, the salts invariably partially decompose each other, forming four salts, the relative proportion of which, depends on the excess of the original salts. Harcourt* and Essen, in 1866, attacked this question in a different way. When hydriodic acid is brought in contact with hydrogen dioxide, double decomposition takes place and iodine is liberated,

$$H_2O_2 + 2HI = 2H_2O + I_2.$$

In dilute solutions this reaction is found to take a considerable time. The object of the investigation was, taking a constant amount of hydrochloric acid in a given solution, and varying quantities of H_2O_2, find the time required to expel the iodine from this hydriodic acid. A solution was made containing H_2O_2 and HI together with starch which served as an indicator; to this solution was added one drop of strong solution of sodic thiosulphate; the free iodine attacked the thiosulphate, converting it into tetrathionate

$$2\ H_2S_2H_2O_4 + I_2 = H_2S_4O_6 + 2HI + 2H_2O.$$

As long as any thiosulphate was present in solution no blue colour could appear; the iodine as fast as it was liberated from the hydrochloric acid by the hydrogen dioxide was reconverted by the thiosulphate. Adding then equal amounts of thiosulphate to the solution, and noting successively the time required for the reappearance of the blue colour denoting excess of iodine, a definite relation is found between the diminution of hydrogen dioxide present in the solution and the increased time taken to perform equal amounts of chemical work. When the amount of hydrogen dioxide present in the solution decreases by equal intervals, the time taken for the diminished amount to liberate a given quantity of iodine from hydriodic acid increases in constant geometric rates.

It was found by experiment that the presence of tetrathionate did not influence the reaction in any way, and that the thiosulphate acted only as represented in the equation; when added to hydrogen dioxide it did not reduce it except in presence of HI. When this law became known, Dr. E. J. Mills recalculated Gladstone's experiments, and found that although Gladstone had not observed this relation, yet it existed in the several reactions with which he experimented.

Harcourt and Essen tried several reactions before hitting on this one, but the conditions were not sufficiently simple to show the action clearly. When oxalic acid is added to a solution containing potassic permanganate and hydric sulphate, the permanganate is reduced at first slowly and as the action goes on at an increasing rate, but it was found that the presence of manganese sulphate formed by the change exercised an important influence on the rate.

* Harcourt and Essen, *Phil. Trans.*, 1865, 193; 1866, 117.

These two investigations, considered alone, seem to point to the continuity of all chemical actions. Chemical action is continuous and takes time, the amount of chemical change in a given unit of time is proportional to the acting masses. Mass enters into chemical change. Other experiments, however, seem to lead to a different conclusion. Bunsen* by exploding mixtures of CO and O, and H and O in various proportions, and determining the pressures produced by means of a weighted valve, considers that combustion is not, as was previously supposed, a continuous operation but has definite stages of action. A mixture of hydrogen and oxygen in the proportion necessary for complete combination produces on explosion a pressure equal only to $\frac{1}{3}$ of complete combustion; increase the amount of either hydrogen or oxygen, and, although the temperature falls, yet the amount of combination is increased when the dilution exceeds a fixed amount in an abrupt manner to $\frac{1}{2}$ of total possible. Berthelot has during last year (1877) proved that Bunsen in his calculations made a serious error by not taking into account the contraction produced by combination; that in fact his research proves nothing but the possible limit of temperatures attainable by combustion. He has not proved even that dissociation takes place at all.

Experiments by Debus on the precipitation of baric and calcic salts by sodic phosphate are considered to prove discontinuous action, but almost similar experiments by Chizynski by sodic phosphate show the action of changed mass to be continuous and not abrupt. In fact on this subject the evidence is conflicting in the extreme, and almost the only conclusion we can arrive at is that authorities differ in the most extraordinary manner.

Berthelot's experiments seem to throw considerable light on the subject; he found actions both continuous and discontinuous. He founded his arguments, (1st) on the heat phenomena accompanying the mixture of solutions of salts; (2nd) on a special method founded on the following facts:—When an aqueous solution of an acid such as sulphuric, which dissolves both in ether and water, is shaken up with ether, the acid divides itself between the ether and the water in a constant proportion which is independent of the relative volumes of the water and ether, but is dependent on the strength of the aqueous solution and on the temperature of the experiments. He thus found a coefficient of division which he applied in the following way:

A solution of potassic bisulphate in water behaved to ether in the same manner as a pure sulphuric acid solution of the same acidimetric strength would, but on increasing the amount of sulphuric acid present partial combination seemed to take place between the neutral potassic sulphate and the acid. In a solution of bisulphate of potash on water the acid exists free, but small quantities may combine by increasing the quantity of acid present.

Sodic biacetate and benzoate behaved in the same manner.

His conclusions may be briefly stated.

(1). Acid salts of monobasic acids cannot exist in aqueous solution, but are immediately broken up into neutral salt and free acid.

(2). Acid salts of polybasic acids can exist in solution, but generally in a state of partial decomposition.

Examples: binoxalates, bitartrates and especially bisuccinates of potash and ammonia.

(3). The quantity of salt decomposed increases slowly and continuously with the degree of dilution.

(4). The quantity decomposed changes with the proportion between neutral salts and the excess of acid present, in such a way that with excess of acid the stability of the acid salt is increased, and excess of neutral salt produces the same effect, but at a slower rate.

The heat phenomena prove the same. When nitric or

* *Phil. Mag.*, 1866.

sulphuric acids are added to their respective ferric salts, in aqueous solution the heat evolved shows increased combination.

Other heat reactions show complete double decomposition with equivalent quantities of salts; in fact with stable compounds, salts are formed in the order of their stability.

On the whole it seems to me probable that chemical action is always continuous when the acting substances are in a state of dissociation, or when the compounds formed are under the particular conditions present near their decomposing points. In the preceding experiments we have always found that where the compound acted on and the compound formed are decomposable by the solvent, the action increases with excess of reagent, as in the case of ferric sulphocyanide.

The effect of mass in chemical actions is due to partial decomposition, and not to an inherent continuity in the method of chemical action. Any discontinuous action may be rendered continuous by raising the temperature sufficiently or otherwise changing the conditions; conversely any continuous action may be rendered discontinuous so far as the effect of mass is concerned.

On the motion of the Chairman a hearty vote of thanks was accorded the lecturer, and the meeting brought to a close.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The half-yearly meeting of the members of this Association was held at the rooms, Halford Street, on Thursday, the 31st day of January last. The report, which was unanimously adopted, stated that in reviewing the past session the committee found much to encourage them, although there had been changes, as upon former occasions, which to some extent influenced the general routine of the Association. In addition to the President's inaugural address, Mr. J. E. Weatherhead had delivered a lecture on "Gems of Sea and Land," Mr. W. J. Harrison on "Fermentation," Mr. F. T. Mott on "Ventilation," and Mr. W. B. Clark on "The more important Elements." Each lecture had been well attended, and listened to with appreciation, and the committee desired very heartily to thank the lecturers.

There had also been 43 classes held, conducted by Messrs. Clark, Garrett, Raynor and Hammond, the subjects being Chemistry, Pharmacy, Botany, and Materia Medica. The average number present at each meeting had been eight, and the committee, in order to establish a system of regular attendance, had offered a prize to that gentleman who should be present the greatest number of times. Two further prizes had been competed for at examinations conducted by the class teachers, Messrs. Crane and Lewitt being the successful candidates. The Council of the Pharmaceutical Society had kindly presented a number of materia medica specimens, and also valuable additions to the herbarium, which had greatly conduced to the usefulness of the museum, and the committee desire to express their appreciation and thanks.

The Treasurer's report showed that the receipts during the half year, including a balance in hand of £1 8*s.* 8*d.* from the last balance sheet, had amounted to £21 3*s.* 8*d.* and the expenditure to £11 19*s.* 11*d.* leaving a balance in hand of £9 3*s.* 9*d.*

After the transaction of routine business the members proceeded to elect the committee for the ensuing session, with the following result: J. Garrett, President; C. T. Raynor, Vice-President and Hon. Secretary; W. B. Clark, Treasurer; W. Hammond, J. J. Pratington, C. B. Lomas, C. Hodgson.

On Feb. 7th inst. the nineteenth session of the above Association was opened by a tea meeting, and the usual President's inaugural address.

The President, Mr. J. Garrett, in his address to the members, said he hoped the classes would be better attended than they had been in the last session, and that the students would take part in the classes by asking questions and promoting discussions upon the subjects treated upon by the teachers. By so doing, the teachers would have a better idea of the wants of the student, and the student would find it a good opportunity of clearing up some doubtful point in the lesson.

At the conclusion of the address a vote of thanks was proposed and carried by the members.

Mr. Thirlby, an honorary member, upon being called upon to address the meeting, drew attention to a chart of the metric system hanging in the room. He stated the importance of a sound knowledge of the metric system, and to make the subject more attractive, he offered the sum of 10*s.* to be given in prizes to the successful candidates of an examination held upon the subject at the end of the session.

Mr. W. B. Clark, the Treasurer, then stated the system to be carried out with regard to the Association prizes, to be competed for at the end of the session. The successful candidates must have obtained at least 55 per cent. of the marks in two subjects, and the two subjects having the highest number of marks only to be taken into account. Thus a student being proficient in two or more subjects will stand higher than a student getting a larger total number of marks, though the number in the two best subjects be less. By this method, students not able to take part in all the subjects, will be encouraged to study two or three subjects well.

Mr. Marshall then in a very spirited manner spoke of the past work of the Association, and pictured a bright future to those who mastered their studies with credit.

Readings and songs were given during the evening, being the largest meeting of the members that had taken place for some time.

Upon singing the National Anthem the meeting, which had been thoroughly enjoyed by all, was brought to a conclusion.

LIVERPOOL CHEMISTS' ASSOCIATION.

The eighth general meeting was held at the Royal Institution, Jan. 31, 1878. In the unavoidable absence of the President, Mr. Robert Sumner (Hon. Treasurer) was unanimously voted to the chair.

The minutes of the previous meeting were read and signed. Donations to the library were duly acknowledged.

Mr. J. T. Armstrong, F.C.S., read a paper on "The Perils which attend the use of some of the Burning Oils."

A lengthy and animated discussion on the paper followed, in which the Chairman, Messrs. J. Abraham, A. C. Abraham, T. Farmer, A. Haddock, A. H. Mason, F.C.S., R. Parkinson, and others took part. On the motion of Mr. Parkinson, seconded by Mr. Abraham, a vote of thanks to Mr. Armstrong was carried by acclamation.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

An ordinary meeting of this Association was held on Friday evening, February 1st, at the Memorial Hall, Albert Square. Mr. W. Wilkinson, Vice-President, occupied the chair, and there was a good attendance.

Mr. F. B. Benger exhibited the telephone, and gave a short address on its construction and the scientific principles involved in its successful working. The instruments used for demonstration had been extemporized by inserting 5-inch bar magnets through the bottoms of turned wood tooth-powder boxes, as suggested by Professor Barrett. The bobbins of No. 36 insulated wire had been slipped over the ends of the magnets inside the box, and discs of thin iron (ferrotype plates) were laid on the top of the open boxes, and held firmly in position by the lids, from which they were separated by thin flanges of cardboard; the lids were furnished with holes, half-an-inch in diameter, through which sounds were conveyed to the thin iron plate, and the line wires connected with the ends of the coil inside the boxes by binding screws inserted in the sides.

By means of these simple instruments, which were taken to pieces for demonstration, members were enabled to converse with each other in different parts of the building, etc.

The Chairman then announced that a paper on "Patent Medicines, by whom should they be sold, and under what restrictions," had been sent by Mr. J. B. Payne, who, he regretted to say, had been prevented by illness from being present. The object of the paper, he believed, was to induce discussion on a subject which was of considerable interest to most of them.

Mr. Payne's paper was then read by one of the Secretaries, as follows:—

"What are the advantages of the trade or profession of a chemist and druggist, or pharmaceutical chemist, at the present time? A question frequently asked and simply answered. The exclusive use of the titles Pharmaceutical Chemist and Chemist and Druggist. Practically, that is all. To an outsider, who had for his guidance and information the Pharmacy Act, it would appear that we enjoyed the exclusive right to dispense medicines and physicians' prescriptions, and to retail poisons. With regard to the matter of dispensing, any person connected with the trade has a fairly good idea of its value as a livelihood to the chemist, and with regard to the sale of poisons it is very far indeed from being exclusive. The fact is that the drug trade does not occupy the position that it should, nor does it possess in reality sufficient advantages to compensate for the demands made upon it by the Government, the medical profession or the public. The medical profession has, in return for scarcely any more severe examination, a very exclusive position or monopoly. In the matter of education, the Government protects, in a very marked degree, those schoolmasters who conform to their requirements. In return for a no more severe examination than the Minor a solicitor holds a very distinct monopoly. Until quite recently I believe that it was sufficient for a barrister to 'eat himself in,' and a very agreeable occupation too.

"These remarks are well worn, but we never seem to get beyond them. We complain and complain and end with complaining. I am decidedly of opinion that we should take action, and my more immediate object in reading this short paper is to invite your opinion whether we should request the Council of the Pharmaceutical Society to move in the matter. We shall certainly gain nothing by sitting still, nor must we hope to carry any proposition right before us without hindrance; there is no doubt but that it will require some considerable energy, and a large amount of patience, and when the start is made it must be with a will and determination.

"The two leading features offered by the Pharmacy Act in return for the Government requirements, are dispensing and the sale of poisons.

"I will pass by dispensing, and confine myself principally to the sale of poisons.

"Now, in this matter we do possess an undoubted legal right and monopoly, but that somehow or other has never yet been strictly enforced. The Trade Protection Society has taken the matter up with some spirit, but appears to find many obstacles in the way. What I cannot understand is, that in London and most other large towns poisons are openly advertised and sold retail by unregistered persons.

"To show the importance which is everywhere attached to regulations for the sale of poisons, I have only to point out how frequently and on every possible occasion, magistrates, coroners, and newspaper editors take the opportunity to read the law in very severe terms, and yet the Government actually license any person who chooses to pay 5*s.*, and offer every facility to break the law.

"I refer to the sale of patent medicines containing poisons, and I maintain that it is entirely wrong for the Government to place an Act of Parliament on the statute book containing such restrictions on the sale of poisons and to compel chemists to pass such rigid examinations, even deeming it necessary to require the examinations to be conducted under the very eye of the Privy Council (thus showing how serious they consider the question to be); I say that it is entirely inconsistent for them to license unregistered persons to evade the Act.

"I have selected one or two extracts from the *Pharmaceutical Journal*, which go to show most conclusively how important it is that the public should be thoroughly protected, and what is more that they think they are.

"'Sale of Laudanum.—Censure of a Chemist by a Coroner.*—The jury returned a verdict of 'Accidental Death,' and in so doing expressed their opinion that it was wrong for so young a man as the witness, Cooke, *to be allowed to serve poisons.* The Coroner entirely agreed with the jury." This young man was twenty years of age and had passed the Preliminary examination. Now what an inconsistency for a law officer of the Crown to censure in a case of this kind, when the Crown actually licenses any greengrocer to sell chlorodyne indiscriminately. But principally I would point out this fact, that both the coroner and the jury were evidently of opinion that it was most essential that the sale of poisons should be restricted.

"'Poisoning by Vermin Killer.†—Several members of the jury complained of the readiness given to persons to purchase *deadly poisons* at these chandlers' shops that sold everything. They felt that the sale of poisons should be restricted to the law that affected chemists. Dr. Chapman said that a packet of the vermin killer cost 3*d.*, and would kill five persons. He concurred with the jury on the careless mode of sale.' And so do I.

"In an editorial article‡ on the sale of poisons and its difficulties, the writer says, 'It seems, therefore, desirable not only for the interest of the public but also for mere self-protection that great care should be exercised in the sale of such medicines as are here referred to [paregoric, etc.], and *that the buyers should be warned as to their relatively different potency.* . . . In this way something may be done towards obviating the possible consequences of ignorance and carelessness.'

"In every way, and from every source, we have full proof that the public demand and have a right to expect protection. But under the present Patent Medicine Act any shoe-black, fusee seller, or halfpenny newsman can indiscriminately retail preparations of atropine, strychnine, morphia, prussic acid, and chloroform.

"To wit. It has properly been deemed necessary to place hydrate of chloral on the list of poisons, yet any unregistered person having a patent medicine licence can retail it indiscriminately.

"Or again. *A Chemist* may only sell morphia under certain regulations, yet if morphia be made into pill or solution and covered with a patent medicine stamp, then any unregistered person may sell it without restriction.

"Is that right? Is it safe to the public? and what a ridiculous farce it makes the poisons' register.

"I have been told that this question of traffic in patent medicines has been frequently discussed, and that it is a difficult question to solve. I admit that, but still I maintain that we must begin somewhere and that quickly.

"In the discussion that would be provoked, we should receive many valuable suggestions, and good results must follow.

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* *Pharm. Journ.*, January 27, 1873.
† *Pharm. Journ.*, April 24, 1875.
‡ *Pharm. Journ.*, April 13, 1872.

I would start with this proposition to which others could be added if thought advisable. "That seeing the largely increasing traffic in medicines of a highly dangerous character, and poisons, under cover of the Patent Medicine Act, by unregistered persons who are totally unacquainted with their character, thus offering and affording a very serious source of accidental and malicious poisoning, and a direct medium for infringing the spirit of the Pharmacy Act, the Council of the Pharmaceutical Society are hereby requested to promote an Act of Parliament for the repeal of that section of the Pharmacy Act which relates to the dealing in patent medicines by unregistered persons whenever such contain any ingredient enumerated in the poison schedule. The proposition desires an Act of Parliament, whereby patent medicines containing poisons can only be sold by registered chemists." This would protect the chemists, and the public. The proposition is given as a basis to commence with, any details could easily be arranged after the general principle was established, and we must be prepared to make some amount of self-sacrifice.

"My object has been to show that we have a distinct right, and that in making out our case we are actually doubly protecting the public.

"It would not interfere with the sale of anybody's goods, as every village has its chemist; it would really add more respectability to them.

"The reason why I advocate quick action is, that if we let the grocers, chandlers, and general dealers get firm hold of the trade, we should then have so much more a large and influential opposition. Even now it would require the united action of the chemists. Every individual member would have to help, as well as every local association."

The following advertisement had been cut from a local paper:—"Special notice—Having enlarged our central premises, we have added patent medicine to our tea and italian trade. All articles will be sold at wholesale price: 1*s.* 1½*d.* bottles at 10½*d.*; 2*s.* 9*d.* at 2*s.* 3*d.* See our price list."

A communication on the same subject had also been received from Messrs. Kay Brothers, and these gentlemen requested that the concluding paragraph which they designated "the remedy" might be read.

"The real remedy we venture to suggest is this—that licences for the sale of patent medicines should only be granted to persons on the register of chemists and druggists or pharmaceutical chemists, or persons approved of by the Council of the Pharmaceutical Society, and that the excise should only grant these licences on production of a certificate from that body, in precisely the same way as now they only grant wine licences on production of a certificate from the magistrates; and to effect this, all that is required is a proper memorial to be brought before the authorities of Somerset House, setting forth in the best manner the reasons why this course is desirable, quite as much in the interest of the public as in that of the chemists, and showing that it could not affect the revenue in any way—also describing the expense and cost of obtaining the necessary qualification to be a chemist and druggist at the present time, and the grievous injury, disrepute and loss they are brought to by the present vendors of tea, grocery, and the like, who sell patent medicines at about cost price in order to catch custom and make better profit out of their tea and other commodities.

"There is little doubt if this could be properly represented to the Board of Inland Revenue by an influential and properly qualified deputation representing the trade and the Council of the Pharmaceutical Society, and also that of the chemists and druggists' and trade associations generally of Manchester, Birmingham, London, etc., etc., with a little pressure (as the Inland Revenue would not by any means suffer from the restriction of licences), it would be a very simple, costless, and effective way of protecting the legitimate trader, the revenue, and the public."

A long discussion ensued, in which a very general opinion was expressed that as patent medicines containing poisons within the meaning of the Act formed such a small proportion of the whole (Messrs. Kay had calculated them to be not more than eight per cent.), it would be useless to attempt to influence legislation in the matter. That small proportion would be scarcely worth the trouble, and was indeed at the present time almost entirely in the hands of chemists.

The following resolution moved by Mr. Hughes, and seconded by Mr. Slack, was carried—

"That this meeting considers it undesirable at present to agitate for any alteration in the law respecting the sale of patent medicines."

The meeting then terminated.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

At the annual meeting of this Association, the Secretary, Mr. J. Turner, read a brief report. It stated that two general meetings and five council meetings had been held during the year. It had been decided to give up the rooms held in Tudor Place. Some of the articles have been sold, and the specimens, books, cabinet, microscope, and maps have been placed under the care of Mr. H. W. Maleham, 7, West Bar. Copies of the rules of the library, etc., have been forwarded to every member of the trade in Sheffield, and it is hoped that the books will be more used than they have been in the past, as they are now available to every member connected with the Association. Mr. Warner has been appointed collector of subscriptions. Although at the last annual meeting there was only £6 6*s.* 9½*d.* in the hands of the Treasurer, he was glad to say, as would appear from the Treasurer's report, that the balance has been largely increased, notwithstanding that the subscriptions had been reduced from 10*s.* to 5*s.* per annum. Meetings had been held in respect of counter prescribing, when resolutions passed by the Council were forwarded by the Secretary to the Chemists and Druggists' Defence Association. Copies of the resolutions had also been forwarded to the county and borough members and the Pharmaceutical Society. Favourable answers had been received from the members. Resolutions had also been passed approving of the action taken by the Chemists' Defence Association on the lac sulphuris *versus* sulphur præcipitatum question. The President, Mr. W. V. Radley, having removed to Southport, had called them together to a farewell supper before leaving to appoint his successor, when the choice fell upon Mr. W. Ward as president *pro tem.* He felt that all would join in saying how sorry they were to lose the advice and counsel of one who was always ready to forward and help the Association in the fullest manner possible. The number of members at the present time was about 47. The Council wished to impress upon the members the importance of taking united action and interest in the working out of this Association.

The report of the Treasurer was read, which showed the receipts to have been £40 12*s.* 11½*d.*, and the expenditure £5 10*s.*, and that there was a balance in hand of £35 2*s.* 10½*d.*

The adoption of these reports was moved, seconded, and carried uuanimously. The election of officers for the year then took place, with the following result:—Mr. W. Ward, F.C.S., President; Messrs. G. Ellinor and H. E. Ibbitt, Vice-Presidents; Mr. W. Jervis, Treasurer; Mr. J. Turner, re-elected Hon. Sec.; Mr. C. Warner, re-elected Collector; Council: Messrs. G. A. Cubley, H. W. Maleham, J. Watts, Newsholme, J. Otley, G. Carr, J. Clarke, and J. S. Barnell.

The President proposed and Mr. Walls seconded that the best thanks be given to officers for the past year.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, Feb. 7, Dr. Gladstone, President, in the chair. After confirmation of the minutes, etc., the names of the following gentlemen were read for the first time:—Messrs. T. W. Drinkwater, S. A. Goldschmidt, W. J. Macadam, S. S. O. Morris, W. A. H. Naylor, A. N. Pearson, and J. Spencer. The following were duly elected Fellows of the Society: —Messrs. T. C. Cloud, G. F. Dowdeswell, A. Ginders, H. R. Hind, J. Woodland, S. P. Pickering, T. F. Harris, G. H. Spring, W. J. Williams, G. S. Taylor, A. Linnell, J. V. Elsden, A. H. Elliott, C. B. Fox, A. Jamieson, A. H. Hooker, D. A. Louis, W. Watson, W. H. Ellis, J. Hadkinson, W. D. Harland, R. Bodner, H. B. Nason, G. E. Stoddart and G. Kühnemann. Mr. E. C. Gill was elected an Associate.

The first paper was entitled—

The Alkaloids of the Aconites, Part II.; On the Alkaloids contained in Aconitum ferox. By Dr. Wright and Mr. Luff. The alkaloid obtained from *A. ferox* differs from that extracted from *A. Napellus*, in that the latter, aconitine, yields well crystallized salts with facility, whilst the former, pseudaconitine, forms crystallizable salts with difficulty. Aconitine under certain conditions loses the elements of water, forming a crystallized anhydro-derivative. When saponified aconitine breaks up as follows:—

$$C_{33}H_{43}NO_{12} + H_2O = C_7H_6O_2 + C_{26}H_{39}NO_{11},$$

Benzoic acid and a new alkaloid being formed. Pseudaconitine likewise forms an anhydro-derivative, but by the action of saponifying agents it forms dimethylprotocatechuic acid and a new alkaloid quite different to that produced from aconitine. The formula of pseudaconitine is $C_{36}H_{49}NO_{12}$; a formula previously given, having O_{11}, was rendered inaccurate by the presence of some of the anhydro-derivative, apopseudaconitine ($C_{36}H_{47}NO_{11}$). Pseudaconitine was obtained from the roots of *A. ferox* by percolating with alcohol acidulated with 0·05 per cent. (by weight) sulphuric acid. The impure product from this process was dissolved in ether, filtered, mixed with about half its bulk of light petroleum, and crystallized; some resinous matter was removed by alcohol and the purified alkaloid recrystallized several times. By analysis the following numbers were obtained:—C 63·09; H 7·47; N 2·12; theory requires C 62·88; H 7·13; N 2·04. By conversion into the nitrate, recrystallization and reconversion into nitrate, the following numbers were obtained:—C 62·71; H 7·44; N 2·07. Au in the gold salt = 19·24; theory requiring Au 19·10. A determination of nitrogen by combustion with oxide of copper and metallic copper in a Sprengel vacuum, etc., gave 2·06 N. Pseudaconitine is far more soluble in alcohol and ether than aconitine. It forms transparent needles and sandy crystals, but is apt to separate as a varnish if not evaporated extremely slowly. Air-dried the crystals are hydrated; at 100° they lose their water with partial fusion. If the alkaloid be dissolved in just sufficient dilute warm nitric acid to form a nearly neutral salt, a few drops of concentrated nitric acid be added, and the whole stirred vigorously crystallization takes place. The sulphate, hydrochloride, acetate, oxalate, etc., will not crystallize. The gold salt of pseudaconitine is distinctly crystalline. $C_{36}H_{49}\,NO_{12}$, HCl, $AuCl_3$.

Pseudaconitine is sparingly soluble in water; it crystallizes with H_2O and melts 104—105°. Aconitine crystallizes anhydrous and melts at 189°. By heating to 105° a new uncrystallizable base is formed, containing C 65·51; H 7·5. A similar substance is obtained by heating the acetate to 130—140°. When heated to 100° in a sealed tube with alcoholic soda for twelve hours, pseudaconitine splits up into dimethylprotocatechuic acid and a new base, pseudaconine,

$$C_{36}H_{49}NO_{12} + H_2O = C_9H_{10}O_4 + C_{27}H_{41}NO_9.$$

The reaction takes place without a sealed tube in twenty-four hours, but more of a resinous bye-product is formed. The reaction was investigated quantitatively. In melting point and physical and chemical properties, the acid agreed with dimethylprotocatechuic acid. The crude alkaloids obtained from *A. ferox*, on saponification, yielded some benzoic acid, from which circumstance the authors think that they probably contained small quantities of aconitine, either present in *A. ferox*, or from the admixture of a few roots of *A. Napellus*. Pseudaconine does not crystallize; it is soluble in water, forming a strongly alkaline solution having a bitter taste, but not producing the slightest tingling; its analysis and properties are given. Saponifying agents, at temperatures above 100°, form dimethylprotocatechuic acid and apopseudaconine, $C_{27}H_{39}NO_8$, which closely resembles pseudaconine. Dilute or concentrated mineral acids saponify pseudaconitine when heated with that substance. Tartaric acid forms apopseudaconitine. Inorganic acids, with certain precautions, also yield apopseudaconitine. Glacial acetic acid yields acetylapopseudaconitine. Anhydrous acetic acid furnishes the same substance. Benzoic acid yields benzoylapopseudaconitine. The authors then give the constitutional formulæ of the above substances, and point out that pseudaconitine is closely related to the opium alkaloids, narceine, narcotine, and oxynarcotine, which all give rise to derivatives of dimethylprotocatechuic acid; moreover all the natural alkaloids which have been split up by saponification yield acids of the aromatic series. Other bases from the crude aconitine were isolated. In fact about one-fifth of the commercial article consists of substances far less active than pseudaconitine; the authors, therefore, recommend that for medicinal use the alkaloid should be separated by conversion into the nitrate, which is almost insoluble in 10 per cent. nitric acid.

The President said that the Society was deeply indebted to Dr. Wright and Mr. Luff for their elaborate research, which they must have carried out at no small risk, the substances being of such a poisonous nature.

In answer to some critical remarks of Mr. Kingzett, Dr. Wright stated that he wished to withdraw a statement made by him at the Pharmaceutical Conference, viz., "that the alkaloid obtained by Dr. Paul and Mr. Kingzett from Japanese aconite was pseudaconitine."

The next communication was entitled—

"*Notes on the Tannins.*" By Dr. Paul and Mr. Kingzett. The authors, during the examination of various tannins, completely verified the statement of H. R. Proctor, that no two processes for the estimation of tannin give similar or comparable results, although when the same process is used against products of the same nature, the results are tolerably constant, *i.e.*, cutch can be compared with cutch, mimosa with mimosa, etc., but not cutch with tannin, or mimosa with cutch. The term tannin includes, not one common substance, but several astringent principles obtained from different plants. After detailing experiments, the authors conclude (1) that the supposition that natural tannin from gall nuts is a glucoside is rendered doubtful, and (2) that the astringent principle common to cutch and extract of mimosa bark is a glucoside, and yields, on decomposition, unfermentable sugar and a peculiar acid, distinct from gallic acid.

The next paper was read by Mr. E. Riley—

On the Estimation of Phosphorus in Iron and Steel. The author instituted a series of experiments as to the relative values of the two methods of determining phosphorus in iron the molybdate and the magnesia processes. The analyses were carried out by several experimenters working independently, and as a general result the author concludes that the molybdate process gives too low a percentage, and that the magnesia method is the only one to be trusted. Some pure peroxide of iron, almost free from phosphorus, was carefully prepared, the trace present determined, and portions, after mixing with known weights of pure phosphate of magnesia, analysed. The results given by the magnesia method were quite satisfactory and concordant. The process as given by the author is as follows :—The substance is dissolved in strong hydrochloric acid and after dilution reduced with sodium sulphite; the excess of sulphurous acid is expelled from the solution, which is then nearly neutralized with ammonia; acetate of ammonia is added and the liquid boiled; the whole of the phosphoric acid in the solution is thus precipitated. If enough peroxide of iron is not present some dilute solution of perchloride must be added. The precipitate is filtered, and the filter dissolved without washing in strong hydrochloric acid, and thoroughly washed. The solution of phosphoric acid with some iron is then evaporated to a small bulk, about 15 c.c.; to this 13 grms. of citric acid are added, the solution neutralized with ·960 ammonia, and 20-30 drops of magnesia solution added; then a moderate amount of ·880 ammonia, so as to make the liquid strongly alkaline; the total bulk should not exceed 50 c.c. After standing two days and nights with occasional stirring, the precipitate is filtered off, washed with ammonia water, dried, ignited, and weighed. The paper contains many analyses.

Dr. Wright inquired if the molybdate precipitate was weighed directly, or was re-dissolved and re-precipitated.

Mr. Warington thought the low percentage of phosphorus with the molybdate process might be due to the presence of chlorides. They should be decomposed by evaporating to dryness with sulphuric acid. From the paper he should gather that too much citric acid had been used, otherwise the magnesia precipitate would come down completely in three hours.

Mr. Riley replied that if the molybdate precipitate had to be re-dissolved up, etc., he failed to see that it had any advantage either in time or accuracy over the magnesia method; that hydrochloric acid must be used for solution; and that unless 13 grms. of citric acid were used, results would be obtained which were quite fallacious.

The next paper was read by the President, Dr. Russell taking the chair, and was entitled—

An Inquiry into the Action of the Copper-Zinc couple on Alkaline Oxy-salts. By Dr. GLADSTONE and Mr. TRIBE. —In 1873 Professor Thorpe proved that the couple converts all the nitrogen of nitre, in the presence of water, into ammonia. The authors had previously observed that nitrites were at first formed and have now made an exhaustive study of the reaction. This chemical change starts somewhat energetically, then diminishes considerably, again increases, and finally ends more rapidly than it began, ammonia and its equivalent of potash slowly increasing from the commencement until the time when the maximum amount of nitrite is produced, when the latter salt rapidly breaks down and is of course accompanied by an increasing amount of the alkalies. Solutions of ammonia containing 0·026 and ·256 per cent. increase the action of the couple, but stronger solutions diminish it. Solutions of potash from 0·08 to 60 per cent. increase the change. By pouring a 10 per cent. solution of nitre, with enough copper sulphate to colour the liquid distinctly, on to some granulated zinc in a tap funnel and allowing it to remain a few seconds, enough nitrite is formed to give the characteristic green colour of copper nitrite and to give a blue coloration with starch, potassium iodide, and acetic acid. The latter reaction can be used as a delicate test for nitrates; 5 c.c. of solution, 12 drops of copper sulphate, and 4 to 5 pieces of zinc-foil $1 \times \frac{1}{2}$ inch, allow to stand for three minutes then pour into 5 cc. of the starch solution containing potassium iodide and acetic acid. On the whole the authors think that the following is the most probable explanation; that the two metals electrolyze the nitre with the formation of nitrate of zinc, the reduction being effected at the negative pole through the agency of the potassium. Many experiments were made but without absolutely settling the question. By electrolysing potassium nitrate solution in a V-shaped tube zinc nitrate was found in the zinc limb and potassium hydrate with smaller quantities of potassium nitrite and ammonia in the copper limb. The copper-zinc couple converts potassium chlorate readily into potassium chloride; no chlorites or hypochlorites were formed. By electrolysing, the greater part of the hydrogen escapes as gas instead of the potassium chlorate being converted into chloride, the reason being that with the couple the hydrogen is probably wholly occluded the moment it is set free; in electrolysis only a small quantity of the gas is condensed by the negative plate. The authors consider the following statements proved. (1) The action of the copper-zinc couple on these oxysalts is of an electrolytic nature. (2) The negative radical combines with the zinc whilst the positive radical or its equivalent of hydrogen from decomposed water is set free against the copper crystals. (3) The reduction and hydrogenization of the salt take place in the immediate vicinity of the negative metal. Also it is probable that hydrogen is actually set free against the copper, but is condensed by the finely divided metal, and in that condition does its work of reduction and hydrogenization. The action of the couple on ammonium nitrate was found to be substantially the same. If the reaction be attempted at or near the boiling point the nitrite formed is decomposed, nitric oxide being evolved.

The last paper was by Mr. N. C. Jones—

On a New Method for the Determination of Boiling Points.—A piece of glass tube 4 mm. internal diameter and 200 mm. long is bent in a U, so that one end which is open extends at least 15 mm. beyond the other which is closed. The bend is made in the form of a circle about 20 mm. in diameter. The liquid, two or three drops of which will be quite enough for the determination, is introduced into the closed end of the U tube, the open end is placed underneath the surface of some mercury contained in a small porcelain crucible. The whole is then slung by means of copper wire into a water or paraffin bath and the temperature of the latter gradually raised. The liquid will of course boil and the vapour drive before it the air; on cooling the whole tube, which the author calls a tension-tube, is filled with mercury, a bubble of liquid occupying the top of the bend. The tube is then inverted and the liquid transferred to the closed end of the tube. Any water or paraffin is now removed from the tube by means of filter paper and some mercury emptied from the open limb. The method of determining the boiling point is as follows: the tube is immersed in a paraffin bath, care being taken that the open end is freely exposed to the air. The temperature is then gradually raised; as the temperature approaches the boiling point of the substance the mercury falls in the closed limb, the tube being gently tapped. At the moment the mercury levels in the two limbs are equal the temperature of the bath is taken by a delicate thermometer placed close to the liquid in the closed limb. The bath is allowed to cool and the temperature at which the levels pass each other again noted, and so six observations are made, the mean of which gives the uncorrected boiling point. Many determinations are given in the paper which agree well with each other. The advantages of the method are obvious, the small quantity of the substance required being one of the most important. Moreover the tension-tube can be labelled and put away for future verification. By using a spermaceti bath boiling points up to 300° C. can be determined.

The Society then adjourned to February 21, when a lecture on laboratory experiences on board the "Challenger," will be given by J. Y. Buchanan.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held at 17, Bloomsbury Square, on Thursday, Jan. 31, when a paper was read by Mr. Sangster on "Common Salt: its Manufacture and Uses." The author commenced by showing how necessary salt is to the human system, explaining the probable decompositions it underwent by the gastric juice and naming some of the substances resulting from those decompositions. The sources of the salt of commerce were next enumerated, the depth of the mines from which it is obtained, the strata passed through in searching those depths, the condition in which the salt is found, and the methods employed for raising the salt to the surface in the state of solution as brine. Its value to the housekeeper on account of its antiseptic properties, and to the farmer on account of its fertilizing properties was also remarked. The paper concluded with a general survey of the distribution of salt over the surface of our globe.

Mr. Harold Senier then exhibited a pair of electric telephones and described briefly the principle of their construction. The instruments were passed round to each member, and every one present had the satisfaction of hearing and being heard through a length of 300 feet of wire. Both papers were followed by long and interesting discussions, and votes of thanks unanimously awarded to the authors. The meeting then adjourned.

Parliamentary and Law Proceedings.

What is an Adulteration of Milk?

At the Hammersmith Police Court, on January 31, Mr. Bridge gave a decision in two summonses against Robert Edwards, of the Mall, Kensington, and Mrs. Sheen, St. Clement's Road, Notting Hill, for selling milk adulterated with water. Mr. Bridge first proceeded with the case against Edwards. He said the analyst of the vestry made a report that the defendant's milk was adulterated with 8 per cent. of added water, there being no other kind of adulteration in it. The certificate of the Government analyst stated that the fat in the milk was equal to that which was found in milk of good quality, but that the amount of solids, not fat, was low, and from those conclusions he (the analyst) was of opinion that there was not less than 4 per cent. of added water. If there was 4 per cent. of added water that would be an adulteration. Looking at the reasoning of the analysts, not their opinions, and practical works on farming, which stated that milk varied to an extraordinary extent, he was not satisfied that the offence had been committed. Mr. Harding, clerk of the Kensington Vestry, regretted this decision, as it would go forth that dairymen might adulterate their milk to a certain extent. Mr. Bridge said a wrong conviction might drive respectable men out of the trade. Mr. Harding retorted that, practically, a certificate of the vestry's analyst of 8 per cent. would be worthless. Mr. Bridge said it would not be so, as Mr. Harding would find that his analyst stated the amount of fat in the milk was below what it ought to be. Both summonses were dismissed.

Beer Adulteration.

At the Lambeth Police Court, on Thursday, January 31, Owen Haster, beer retailer, late of the George, St. George's Road, Peckham, was summoned by the vestry of Camberwell for selling beer which was not of the nature, substance, and quality of the article demanded. Mr. Marsden, the vestry clerk, said the case was one of considerable public importance. Dr. Bernays, professor of chemistry, had given a certificate that the beer in question was adulterated to the extent of 96 grains of salt per gallon. Mr. Lilley denied that any salt had been put into the porter. The defendant had been obliged to leave the house, and had lost 140*l*. by the place. What he had done was to use liquorice and sugar, in order to satisfy the taste of his customers, who had complained they could not drink the beer. The defendant was willing to plead guilty as to the introduction of liquorice and sugar, but most positively denied using salt. Dr. Bernays, in his evidence, said that there was salt in sugar, which might now account for the statement made by Mr. Lilley, and the more common the sugar the more the salt. The beer in this and other cases promoted instead of quenching thirst. One of the defendant's customers was called, who stated that he had advised him to make his beer palatable, and he used liquorice and sugar only. The practice was common in the trade. Mr. Ellison said the case had been much altered by the evidence of Dr. Bernays, that sugar contained salt, or he should have inflicted the highest penalty. The sooner defendant and others got rid of the notion of adding anything to the beer after it came from the brewers the better for them. He imposed a penalty of 20*s*., and 12*s*. 6*d*. costs.

Alleged Poisoning by Iodine.

On Monday the 4th inst, an inquest was held at Longton, before Mr. J. Booth, Coroner, as to the death of Catharine Marrow. The deceased was stated to be thirty-three years of age, had been ailing for a short time, became worse on January 31, and died rather suddenly on the 1st inst. A bottle produced, and labelled "Poison," was found upon her; but nothing particular was thought about her death till the bottle was found. P. C. Lees spoke to his knowledge of the deceased for the last five years as a drunken, dissipated woman, who had often been in trouble. He visited the house where she had died, and found the bottle produced in her pocket. He ascertained that the bottle was procured by the deceased from Mr. Geant, surgeon; and that it had contained tincture of iodine. It had been given to her for her to paint her back with. There was one drachm supplied, and if swallowed was more than sufficient to cause death. The bottle when discovered upon deceased was empty. Margaret Corcoran, a married woman, spoke to having seen deceased after she was dead, and there was nothing on her back to indicate that it had been painted with anything. It was discoloured, but the colour was of a natural kind. The Coroner put it to the jury whether they would decide upon the statements made or have an adjournment so that a *post mortem* examination of the body could be made. There was clear evidence that the bottle of iodine had been supplied to deceased, that her body showed the iodine had not been used thereon, and that when the bottle was found upon the woman its contents had disappeared. The foreman of the jury said he did not see that any purpose would be served by an adjournment. The Jury returned a verdict to the effect that the deceased woman died from the effects of taking tincture of iodine, but whether wilfully or accidentally was not known.—*Staffordshire Sentinel.*

Poisoning by Chloral Hydrate.

An inquest was held at Folkestone Road, on Monday, February 4, on the body of John Carpon Mallett, Cinque Ports Trinity Pilot, who died on the previous Saturday morning at 3 o'clock. Mr. Sydenham Payn (Deputy Coroner) conducted the inquiry. The widow of the deceased said, he had been suffering from rheumatism, and on Thursday night he took a dose of chloral, one teaspoonful. He got up between 2 and 3 o'clock, and took some more, but she did not see what he took. In the morning he appeared to be in a stupor, so she sent for the doctor. He had been in the habit of taking this stuff for six years. Once before, three years ago, it had a bad effect upon him, he having taken too much. She found a bottle [produced] in his desk, locked up. The other bottle was full when he went to bed, and she believed what was gone he took out of it in the night. It was Hunter's solution of chloral.

Mr. A. G. Osborn, surgeon, said, on Friday morning he found deceased lying on his back in bed quite unconscious, with a very dusky countenance, and breathing only once, twice, or three times in a minute. He was quite incapable of being roused. He employed the usual means for restoring respiration, and a powerful galvanic current from the nape of the neck to the pit of the stomach for nine hours. He remained in attendance till two in the afternoon and the breathing had a little improved. Witness saw him again at 5 o'clock. He was still unconscious, but seemed improving. Witness visited him again at half-past nine and he had quite recently aroused. Rather suddenly he seemed to wake up. He was able to support himself in bed and could answer questions in a rather loud but very shaky voice. Left directions how he was to be watched and fed during the night, but did not see him again alive. When witness inquired what he had taken, his wife said he had taken some chloral. Witness was of opinion that death was caused by some narcotic poison. The death seemed to have arisen from the long exhaustion from the narcotic.

By the Coroner: I do not know whether this is under the Pharmacy Act. It is not in my directory. Chloral is a powder like soda and I cannot say how strong this is, it all depends on the solution. Chloroform and preparations of laudanum are in the directory, but not chloral, though it might have been added since.

The Jury unanimously returned a verdict "That the deceased died from exhaustion resulting from accidentally taking an overdose of Hunter's solution of chloral."

The Jury afterwards resolved to send a memorial to the Home Secretary, requesting him to put this narcotic in the list of drugs sold under the Pharmacy Act, so that it may be distinctly labelled "poison."

Poisoning by Arsenic.

At the Chester Winter Assizes, on the 6th inst., Ellen Johnson was indicted for the wilful murder of her infant. From the evidence it appeared that suspicion having been excited respecting the death of her children, the bodies of two were exhumed as well as that of her mother. In all of them arsenic was found. The Jury found a verdict of guilty, and the prisoner was sentenced to death.

Prosecution under the Pharmacy Act.

During the trial of a charge of coining at the Lincoln Winter Assizes, it transpired that two ounces of cyanide of potassium had been sold to the prisoner by Mr. Shepperley, chemist and druggist, of Nottingham, without the provisions of the Pharmacy Act as to the registration of the sale, etc., being complied with. Mr. Justice Huddleston therefore suggested that proceedings should be taken against Mr. Shepperley. At the hearing of the case the defendant pleaded guilty to having sold the cyanide without making the proper entry in his poison book, but urged, through his solicitor, that as cyanide of potassium is much used by photographers, chemists and druggists are often placed in difficult circumstances.

Dispensing Memoranda.

[54]. Creasote Pills.—In the last monthly summary of the Dispensing Memoranda a method was suggested by which two minims of creasote may be satisfactorily combined with two grains of compound rhubarb pill without the result being a bolus on the one hand or an inconvenient exudation of creasote on the other, and the remarks closed by indicating the value of a little time spent in determining the best proportions of calcined magnesia to each minim of creasote and also the time required for its solidification.

I adopted the hint given, and whilst engaged on the subject my attention was directed to a letter from Mr. Martindale in the Journal (p. 619), expressing a strong objection to the addition of calcined magnesia to creasote for two reasons, one being that the creasote is for the most part combined, and the other that the resulting pills are "as hard and as insoluble as marbles."

Previously to the appearance of Mr. Martindale's letter, I had made my pills, using half a grain of calcined magnesia to each minim of creasote, allowing them to stand a few hours before adding the compound rhubarb pill, and succeeded very satisfactorily. At intervals of one or two days for more than a week I examined the pills thus made, they became firm, but not at all more hard than is usual with pills of varying composition; they broke into pieces with the finger nail and crumbled between the finger and thumb. I did not boil them, for boiling is not represented in any part of the digestive process; but I used water at blood heat and such a gentle motion in the palm of the hand as would best represent the peristaltic action of the intestinal canal in the process of digestion. The pill was disintegrated in a few minutes and the odour of creasote was at the same time developed; the hardness and insolubility referred to, therefore, do not apply to the pills made by myself and with B. P. materials.

Another pill placed in a test tube with warm water to which a little hydrochloric acid had been added gradually yielded up its creasote as the pill fell to pieces. Whatever, therefore, may be the state of combination of the creasote when calcined magnesia is used to make up the pill, it is set free by dilute hydrochloric acid, so that if the creasotic acids do combine with the magnesia they would be liberated by the gastric juices of the stomach.

When creasote is prescribed in the pilular form it may be assumed that the writer has a definite object in view and desires the slower action of the pill as compared with that of an emulsion. If so, his intentions would be fulfilled by a firm pill that gradually, under the influence of the acid secretions of the stomach assisted by warmth and motion, disintegrates, yielding up its creasote in the process of digestion, and this may be just what the prescriber would desire.

In support of "The Month," I ask for the insertion of the result of experiments undertaken at the suggestion it contains in the paragraph referring to these pills.

Pil. Creasoti.

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[59]. "Pandrodyne."—I had the following presented the other day, and shall be obliged if any reader can furnish me with the composition of Pandrodyne. Several West End houses were tried, but they had no knowledge of the preparation:—

℞	Tinct. Senegæ	℥ss.
	Aq. Lauro-Cerasi	℥ss.
	Pandrodyne (?)	ʒij.
	Acid. Sulph. Dil.	ʒiij.
	Syr. Rhœdas	℥ss.
	Mucilaginis, ad	℥iij.

Misce. ʒj ter die tussi urgente.

J. W. Barnes.

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[60]. Please inform me, through the Dispensing Memoranda, how to dispense the following:—

℞.	Balsam. Copaibæ	ʒj.
	Pulv. Rhei.	℈ij.
	Magn. Carb.	℈j.

Ft. pil. 24.

Assistant.

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[61]. Ung. Hyd. Nit. B. P.—Would any correspondent kindly inform me if it is proper to heat the solution of mercury in nitric acid till the reddish brown fumes cease to be given off? Or should the ointment contain free nitric acid?

The nitric acid ordered in B. P. is much in excess of what would dissolve the mercury.

Inquirer.

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[62]. Plaster Spreading.—In spreading a belladonna plaster on leather, is it usual to make an adhesive margin?

Emplastrum.

Correspondence.

**** No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Institute of Chemistry.

Sir,—In your last issue there is a remark reported in a speech by Professor Attfield, at the first general meeting of "The Institute of Chemistry," which is, I think, calculated to do mischief, and which being erroneous, should be corrected with as little delay as possible. In reference to a circumstance which, according to the same report, had been described by Dr. Frankland, the Chairman, as a "temporary opposition of the Pharmaceutical Society to the articles of association as originally drawn," and which after the speech of the Professor the Chairman declared to be "a fair ground of complaint," Professor Attfield is stated to have said "*With respect to the action recently taken by the Pharmaceutical Society, he thought it was pretty well known by this time that that Society was really urged to it by the Privy Council.*"

Having had full cognizance of the whole transaction, I am in a position at once to affirm that that action was in no way urged on the Pharmaceutical Society by the Privy Council.

Professor Attfield puts the saddle on the wrong horse.

The articles of association being submitted to the Board of Trade for approval were in due course handed to the Privy Council, the latter body being, under the Pharmacy Act, the supervising authority over the Pharmaceutical Society.

The Privy Council having this *authority* delegated to them by the Legislature naturally assumed with it the *protection* of the Society, and forwarded the "articles" to the Council of the Pharmaceutical Society for perusal, but certainly without instigating opposition.

To suppose that we could possibly object to a Society formed by such distinguished men, and for such high purposes, seems so unreasonable that I need scarcely say a word on that point.

The real point to which in the interest of our constituents we did take exception was the *title* proposed for the members of the new institute. It was "Professional Chemist." Dr. Frankland remarked that, "he thought the members of the Pharmaceutical Society might with very great propriety term themselves professional chemists," and that it was therefore unwise for the new body to take that title without limitation. "Professional" is a general term, which may be applied to pharmaceutical, analytical, agricultural, and many other chemists, and therefore I think the members of the "Institute of Chemistry" may thank the Pharmaceutical Society for having saved them from so loose a title.

George W. Sandford.

February 13, 1878.

Sir,—Kindly allow me to correct a point in my speech in defence of the Pharmaceutical Society at the meeting of the Institute of Chemistry as described in last week's *Pharmaceutical Journal*. I am reported to have said that the Privy Council urged the Council of the Pharmaceutical Society to take action in the matter. What I did say, following the President, was that the Privy Council, moved by the Board of Trade, initiated, I don't think I said urged, action by laying the matter before the Pharmaceutical Council. My desire was to show that pharmacists were not antagonistic to but in sympathy with the objects of the Institute. A contrary opinion was to my knowledge previously held by many members of the Institute.

John Attfield.

The Dental Practitioners' Bill.

Sir,—The thanks of a number of chemists are due to you for calling attention in your article of last Saturday, "On the Proposed Dental Practitioners' Bill," to the ambiguous wording of part of the clause referring to the qualification for registration. In order to make the point referred to by you quite clear, it behoves those members of the Council who form the Parliamentary Business Committee, to at once move in the matter, or a number of chemists, principally in the country, who have for many years practised dentistry in connection with their business, will be liable to serious interference in this branch of their calling.

Henry Long.

Croydon, Feb. 12, 1878.

Sir,—I think all chemists who are practising dentists as well, and who would suffer considerably if the term "separately" in the proposed Act should be construed in the way that it would exclude any persons other than mentioned from the right of being registered, will be much indebted to you for pointing out such a flagrant injustice to vested interests.

Would it not be all we need, to secure us against such, to modify the clause thus, "separately or in conjunction with the practice of medicine, surgery or pharmacy." Would it be too much to ask you to make such a suggestion in a short editorial note next week? If not I think you will do those interested a great favour. A simple clause similar to the 21st section of the Apothecaries Act 1815, reserving the rights of chemists under this new Act would be advisable. I have written to Sir John Lubbock to-day, drawing his attention to it, and asking as well our member to look to it.

G. J. Gostling.

Stowmarket,
February, 11, 1878.

Sir,—Day by day I have been going to write to you, to ask you what action the Council intend taking with regard to the "Dental Bill" now before the Houses, but each day something or another has occurred to prevent. I am very pleased however to find that it has been made the subject of an article in this week's Journal, and that precisely the same view which I have taken of it is there expressed. Whether it is intended as an insidious attack upon those chemists who practise dentistry or not, I must leave, but certain it is that the Odontological Society and the framer of the Bill have no friendly feelings towards us, which is fully evinced by their literature.

Are we to be sacrificed, whilst any ignoramus who practises dentistry *per se*, is to be registered? to wit, an ex-policeman who actually practises as a dentist in a neighbouring town near here, while another not far off can scarcely write his own name.

I think that not a moment is to be lost in opposing the Bill as it stands, for the words clearly convey that a man must practise dentistry alone or in connection with medicine or surgery to get registered. The way to meet the difficulty of course would be to add the word "pharmacy" after surgery, but how is this to be done?

I am not well informed, indeed informed at all, in parliamentary matters, but I sincerely trust that the Council will instruct their solicitor to take immediate action in the matter.

F. C. Maggs.

Yeovil.
February, 7 1878.

The Preliminary.

Sir,—One might certainly imagine that the questions set at this examination would be easily answerable by the majority of aspirants, but the results prove the reverse. The average intellectual height of candidates falling short of the standard fixed, perhaps it is only natural that some should desire to have the standard depressed, so as to be more in accord with the height of the pharmaceutic recruits. Whether the cries for retrogression are unreasonable is open to criticism. If the tide of education in this country were on the ebb, it might be undesirable or useless for pharmacy to struggle against the stream, but since on every hand there are evidences of progressive educational activity, it might happen that a body attempting to move in a direction opposite to the general current would be in danger of being wrecked upon the banks. So far as personal experience goes, I can testify to the fatal accuracy of the deregatory comments upon middle class education made by certain members of the Council. If the education of middle class schools generally approximates to that received by the writer, then it is high time all private educational enterprises were suppressed or placed under Government inspection. When I quitted the school of idleness where my "education" had been accomplished, I should most certainly have been completely floored by half the questions set at the Preliminary, as then conducted; and yet the dearly bought smattering of scholastic knowledge I possessed was dignified by the appellation of a good education, being like most other articles valued for the price paid for it. But could the cause of so many failures be traced to a rotten system of education, it would be for the system to improve or be improved away altogether, and replaced by methods more after the spirit of the age. To lower the standard of the examination in order to meet the exigencies of a worthless educational machine, would be for a modern ironclad to strike its flag to a rotten wooden hulk of a past generation. It is to be hoped, for the sake especially of the future prestige and position of pharmacy, that there will be no yielding to the party of retrogression.

JUVENIS.

THE PATENT MEDICINE STAMP AND LICENCE.

Sir,—Now that the war panic is over, and the Chancellor of the Exchequer is thinking of his Budget, and is likely to have a surplus to deal with, I think it would be to the interest of pharmacists to ask him to consider the policy of abolishing the Patent Medicine Stamp. We all know how unequally and inefficiently the law works with regard to this tax, which permits a single Steedman's Soothing Powder to be sold without a stamp, but fines a chemist who sells a tooth powder recommended for the prevention of toothache. But it is not on this ground so much as that of the necessity there is of bringing the sales of all preparations containing poisons that are sold with a patent medicine stamp, under the same regulations with regard to the Pharmacy Act as other poisons, vermin killers, etc., are; that is, being labelled with the word poison, registering the sale where necessary, and being sold only by persons registered under the Pharmacy Act. The process of poisoning the public by means of quack nostrums sold as bargains (?) at the numerous stores at prices 30 per cent. below those marked on them, is one which in the interests of the public should be taken cognizance of pharmaceutically, medically, and legislatively. Perhaps the Council of the Pharmaceutical Society might be induced to broach the matter to the Chancellor of the Exchequer, whose chief once said "*Omnia Sanitas.*"

With the abolition of the Patent Medicine Stamp, the Patent Medicine Licence would have to be repealed also. If it be argued the Revenue will not bear the reduction, a general licence on all retailers of poisons might be substituted for it, that is on all pharmaceutical chemists, chemists and druggists and medical practitioners keeping open shop, —say 5 per cent. on their rent. This may be thought to be a retrograde movement, but in the interests of the public (and the Revenue) other professions and trades are regulated by licence, and as the Income Tax is found to be inoperative as regards taxing co-operative stores, by licences they would have to share some of the burdens of traders. By licence also the growth of mushroom stores and pharmacies would be somewhat limited. Perhaps my brother pharmacists will ventilate the subject.

WM. MARTINDALE.

10, *New Cavendish Street,*
January 24, 1878.

LOW PRICES.

Sir,—When we speak to a brother chemist of the absurd prices charged for patent medicines and other articles in many druggists' establishments, and of the desirability of the Society doing something to check, if possible, the rapid growth of this system, we are reminded that the Pharmaceutical Society is not a trade, but an educational Society, and therefore has not, and does not take, cognizance of its members' behaviour towards each other in the matter of underselling. Now this remark may be all very well in a general way, but surely education and a proper mode of conducting business are not incompatible. The butcher and the baker keep up their prices; they seem to work on a sensible principle, and surely if these men can do so there can be no excuse for the suicidal policy of many of the chemists of the present day.

It was but yesterday, I heard of a chemist near Finsbury Square, who had in his window Wright's soap ticketed at 4*d.* per tablet! and not only is this system proving ruinous to those who carry it out, and injurious to their neighbours, but it renders our transactions with our customers no longer pleasant, but most disagreeable; for we are constantly being told, "I only pay 10½*d.* for Cockle's pills at your neighbour's, and he charges me 4*d.* for feeding bottles," etc.

For some time there were very few who descended to these low prices, but now a kind of self-defence has sprung up, and at the eastern part of London full prices will be found the exception.

It is high time some steps were taken with the view of stopping this cutting wave; it is flowing in all directions, its influence will soon be painfully felt throughout the country, and unless its progress is speedily stayed, one of two results must inevitably occur: either the pharmacist will have to make such additions to his stock, to enable him to live, as will so disfigure his business as to render it no longer recognizable as an establishment in which chemical knowledge is exercised, or quietly submit to utter ruin!

J. R. SUMMERS.

Curtain Road, London, E.C.
January 29, 1878.

Erratum.—On p. 638, col. i., l. 40 from top, *for* "matura" *read* "mahwa."

J. Laurie.—Perkins' Cantor Lectures on the Aniline or Coal Tar Colours, published in the *Journal of the Society of Arts*, vol. xvii. Reimann's 'Aniline Colours,' translated by Crookes.

F. B. L.—(1) The Secretary of the Royal College of Veterinary Surgeons is Mr. William Henry Coates, 10, Red Lion Square, W.C. (2) We do not know.

T. Brown.—Probably the result obtained by you was due to the quality of the pyroxylin used.

C. G.—An abstract of the law relating to the registration of trade marks will be found in the Society's Calendar, which is just ready, and in vol. vi., pp. 547 and 553 of this Journal.

"*Vandyke.*"—We are not aware that any such a formula has been published, but in India Goa powder is rubbed up into a paste with vinegar, lime juice, etc.

"*Calcium.*"—Recipes for Coffin's Composition Powder will be found on p. 498 of the current volume of this Journal.

R. C. B.—We are obliged to you for your communication, but you appear to have mistaken the purport of the question, which was not as to the nature of stinking hellebore root, but where a supply of it might be obtained.

W. W. Talbot.—Apply to the Secretary for a copy of the pamphlet entitled 'Hints to Apprentices and Students.'

X. Y. Z.—Metallic copper at a bright red heat decomposes water vapour.

"*Veritas.*"—You will find full information upon the subject in vol. v. of this Journal, pp. 421 and 865, and in many other subsequent pages.

W. R. O. C.—(1) We are not aware that the supply is limited. (2) We are not aware that any restrictions are laid upon the candidates as to the order in which they shall deal with the questions. (3) The answer to this question is included in the answer to the first. (4) Probably the best plan would be to forward to the College of Preceptors a schedule of questions of the nature which you think would be preferable to those at present adopted by the examiners.

C. E. Palmer.—(1) Slightly acidify, distil off the acetic acid, and then test. (2) Water or alcohol would dissolve other substances as well. (3) See the paper on Oxalate of Cereum, by Mr. H. Greenish, vol. vii. of this Journal, p. 909; or Watts' 'Dictionary of Chemistry.'

NOTICE.—Correspondents are particularly requested to comply with the terms of the notice that advertisements should be sent to Messrs. J. and A. Churchill, 11, New Burlington Street. Neglect of this rule frequently involves delay and disappointment.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Talbot, Mr. Watson, Mr. Robson, Mr. Sumner, W. D., R. C. B., "Apothecary," "Misch Masch."

"THE MONTH."

Notwithstanding the mild weather in the earlier part of this month flowers are very backward. Although we hear from the Isle of Wight that the celandine, barren strawberry, dandelion, mouse ear, dog's mercury, and other early flowering plants, as well as the primrose, daffodil, hazel, and willow are coming into blossom there, yet we have not as yet seen many of the flowers which were in blossom at this time last year The buds of the elm are only beginning to be visible, the almond and cornelian cherry show no signs of blossoming, the *Forsythia suspensa* has not even shown flower buds, while the mezereon and spurge laurel are very late in opening their blossoms.

The dog's mercury (*Mercurialis perennis*), although one of our commonest plants in shady woods and thickets, is perhaps better known by sight to many of our readers than by name. Among the British plants of the Euphorbiaceæ it is remarkable for not having milky juice, and for the capsular fruit, consisting of only two cells, all the other British plants having a three-celled ovary. The plant is diœcious, the male flowers being arranged in axillary spikes, each flower having three green sepals and from nine to twelve stamens. The female flowers are arranged in a similar way, but the spikes are usually furnished with not more than two or three distant flowers, sometimes only one blossom being present at the top of the spike. In the female flower there will be found two slender threads between the calyx and ovary ; these are considered to be abortive stamens. At the base of the leaves minute stipules may be found. If carelessly dried, so that the leaves remain damp for several days, a deep bluish tint pervades the leaves. This is owing to a blue colouring matter which is said to be given out when the plant is steeped in water, and is turned red by acids, but destroyed by alkalies. Both this species and *M. annua*, which flowers in July, yield, on distillation with quicklime, a volatile, very poisonous liquid alkaloid, which by the action of the air forms a soft resinous substance.

The gardens are, however, showing signs that spring is at hand. The bright yellow and purple blossoms of the early crocus and the delicate drooping pendants of the snowdrop are springing up here and there, and the favourite Lent lily is preparing to decorate the cottage gardens with its blossoms. Primroses and violets, too, are not wanting in the sheltered spots.

The little winter aconite, *Eranthis hyemalis*, is a flower often to be met with in gardens at this time of year. Its involucre of green bracts might be easily mistaken for the calyx by a careless observer, and the yellow petaloid sepals for the corolla. The true corolla consists, however, of a ring of small tubular petals, something like those of the Christmas rose, almost hidden between the stamens and the yellow calyx. The apparent root of this plant is a corm, as in *Ranunculus bulbosus*.

'Medicinal Plants' for this month contains figures of the following plants :—*Pistacia Lentiscus*, *P. Terebinthus*, *Lens esculenta*, *Ferula Narthex*, *Erigeron heterophyllum*, *Styrax Benzoin*, and *Tylophora asthmatica*. *Lens esculenta*, the lentil plant, and *Ferula Narthex* are perhaps better known under their old names, *Ervum Lens* and *Narthex Asafœtida*. The lentil plant has but slender claims to be considered as a medicinal plant, since they rest only on its use in foods for invalids.

Those who have not been able to obtain a copy of the excellent figure of the asafœtida plant in the Transactions of the Royal Society of Edinburgh will be glad to see the very good representation of the plant given in this number. The branching habit of the flowering stem, so different from the almost bare one of the *Scorodosma fœtidum* and the large leaf sheaths are well rendered. The authors consider that the absence of calyx teeth and involucre and the irregular vittæ in the commissure of the fruit are not sufficient characters to separate the genus *Narthex* from *Ferula*. *Erigeron heterophyllum* is an American remedy for gravel and various kidney diseases. It is called sweet scabious in America, but must not be confounded with the sweet scabious of English gardens, which is a true scabious (*S. atropurpurea*, L.). The application of English names to American plants often leads to curious mistakes. *Tylophora asthmatica* is an Indian plant, official in the pharmacopœia of that country as a substitute for ipecacuanha.

The article upon assafœtida contains the most recent information upon the subject, including Dr. Dymock's recent remarks in this Journal. The materia medica portion of benzoin, however, is not treated upon so fully, no mention being made of the Palembang benzoin which is so frequently to be seen in the drug sales, and from which a large proportion of the benzoic acid of commerce is obtained, nor is Sumatra benzoin in tears alluded to.

The arguments against the habit of smoking have recently received an addition, in the shape of a paper from an eminent Parisian oculist, who finds a form of blindness, resulting from the use of tobacco, to be very common. The blindness referred to seems to differ from that resulting from the excessive use of alcohol, in the fact that the pupil of the eye is contracted.

A very interesting paper by "Mucor," in the *Medical Times and Gazette* of February 2, points out how greatly botanists, and especially mycologists, might assist the study of disease, by observing the various stages of growth of microscopical fungi and their modifications under different conditions. The author puts forward the very reasonable view that many of the bacteria are only parts of a plant which has other forms and other modes of growth and propagation when not confined to the living organism or to fluids, and regards the bacterium as a transitional or provisional, and not as a permanent form, but an abnormal phase of life thrust upon the plant by accident. There can be but little doubt that if investigations of this subject be carefully carried out, and the bacteria traced to their source, that it will be possible to control the spread of zymotic diseases to an extent at present little dreamt of.

From the *Lancet* we learn of the use of nitrite of amyl in ague, the inhalation of the vapour at the commencement of the cold stage causing a glow over the whole body and causing the shivering fit to come to an abrupt end. This remedy has also been recommended in whooping cough. A surgeon, writing to the same journal, recommends the trial of stramonium in hydrophobia, as he believes it to be used successfully in Southern China and Ceylon. It may be hoped that out of the number of remedies suggested during the past year for this terrible dis-case, one may ultimately be found to prove of some service.

In the *British Medical Journal*, Dr. Nairne of Glasgow finds tincture of belladonna, as an external application, very useful to restrain the sweating in phthisis, a result which might have been expected from the success which attends its use in the distressingly profuse perspiration which is sometimes localized in the feet.

Mr. Wills of Chester recommends capsicum, in thirty grain doses every hour, in delirium tremens, and states that he has used it with unvarying success for twelve years; this agrees well with the known effect of a powerful American stimulant, prickly ash bark (*Xanthoxylon fraxineum*) which has a similar action and allays the thirst for drink.

Dr. Wyndham Cottle recommends the use of iodoform as a parasiticide, and for indolent and syphilitic ulcers and wounds, in the form of ointment of the strength of twenty grains to an ounce of lard. Dr. Lennox Browne recommends a solution in the proportion of one part of iodoform to ten or twelve of ether for local application in post nasal catarrh.

Thymol still continues to attract attention, Dr. Radcliffe Crocker using it with success in psoriasis and other skin diseases. He gives the following formulæ for galenical preparations of this substance —For ointment, one to thirty grains of thymol to an ounce of vaseline; for a lotion, five grains of thymol, rectified spirit and glycerine, of each an ounce, water sufficient for eight ounces; also a solution of from five to eighty grains of thymolate of potassium to eight ounces of water. It may be interesting to dispensers to know that when the ointment is carelessly made, so that minute crystals are present in the ointment, these crystals will act as a caustic, and produce minute holes in the skin. On this account it is necessary to dissolve the thymol by rubbing it down with a little alcohol before mixing it with the vaseline.

Iodide of ethyl has recently been employed by Professor Sée as an inhalation in asthma, and is reported to relieve the paroxysms of difficulty of breathing very rapidly.

From *Nature* we learn that Dr. E. Lewy has proved, before a large audience at Vienna, that the human skin is completely impenetrable to the chemical contents of mineral waters, and that therefore the advantage of bathing in these waters must be due to their physical and not their chemical effects. It would be interesting to know whether these experiments relate only to cold water, or to warm as well, since the latter would open the pores of the skin and presumably render absorption possible.

New Remedies is, as usual, full of interesting matter, culled from all possible sources. A paper detailing the popular materia medica of Eastern Tennessee seems to take one back two or three hundred years in the domain of medicine, and gives a ludicrous view of the slow progress of education in that part of the United States. One of the most remarkable of the remedies is the treatment for whooping cough, which is "Nearly drown the child by suddenly pushing him into the water." A barbarous remedy, although doubtless the shock to the nervous system would be beneficial to a certain extent. "Flint" broth and "moleskin tea" are, however, scarcely likely to be serviceable, expect through the medium of faith.

As hydrobromic acid is now coming into use in medicine, the following method of preparing it, recommended by Hager, may be found useful to some of our readers: One hundred parts of sodium hyposulphite, 50 parts of bromine, and 10 parts of water are placed in flask, and the gas which is generated is conducted into the upper portion of 140 parts of water contained in another vessel. When the gas comes over slowly, a gentle heat is applied. The product is from 185 to 190 parts of liquid acid, containing 25 per cent. of absolute hydrobromic acid, and having a sp. gr. of 1·204. It should be kept in a cool place and protected from the light.

A paper in the *Pharmaceutische Centralblatt*, on neurine, a base which has recently been used for diphtheria, gives two processes for its preparation, one from bile and the other from yolk of egg, as well as tests for its purity.

Phosphide of zinc in a granule of from one to two-fifteenths of a grain thrice daily seems to have proved an effectual remedy for hysteria, in the hands of Dr. Gros.

Mesquite gum, which was noticed in this Journal some time ago, has now become an article of export, some 24,000 pounds having been recently gathered in Texas.

The Americans are certainly in advance of the English in one point respecting drugs, they do not allow bad samples to enter the market. The assistant appraiser's report of those which have been rejected at the port of New York during the last year, includes 42 boxes, 29 cases and 1 barrel of guaiacum; and 25 drums, 7 barrels of copaiba, 11 bales of jalap, and smaller quantities of rhubarb, squills, assafœtida, Iceland moss and hellebore roots. It would save much trouble to wholesale purchasers in this country if a similar supervision were exercised by Government at the large ports in this country.

A new application for carnauba wax is reported from France, where a patent has been taken out by M. Thellot, in which it is used in making petroleum soap.

Dr. M. C. Mohr, writing upon the revision of the United States Pharmacopœia, recommends the admission of the following old remedies, *Chelidonium majus*, *Malva rotundifolia*, *Symphytum officinale*, and *Verbascum thapsus*, on account of their being still much valued by the people; and in addition to other new remedies, such as *Coca*, *Grindelia*, *Jaborandi*, etc., he proposes the introduction of *Pycnanthemum linifolium*, as a valuable remedy in atonic dyspepsia. *Cactus grandiflora*, also finds a place among the list of new remedies; while thymol, amyl nitrite, trimethylamine, apiol, and some others have, he considers, but doubtful claims for adoption. The plea that various herbs should be admitted into the national pharmacopœia because they are valued by the people, although seldom used in legitimate practice, is one which, if applied thoroughly, would make the pharmacopœia almost a dictionary of materia medica.

In the *American Journal of Pharmacy*, a paper is contributed by Professor Maisch, on the Useful Species of Viburnum. The only one possessing any medicinal interest is the *Viburnum prunifolium*, recently introduced into notice by Dr. Phares of Newtonia, Miss., as a tonic and preventive of miscarriage. The fruit is stated to be a small edible blue-black drupe, and is known as the *black haw*, and the leaves are said to be used occasionally as a substitute for tea. This shrub occurs in the United States from Connecticut to Florida, and westward to Mississippi. In the paper the fruit of the wild guelder rose (*Viburnum opulus*) is said to be sometimes used instead of the cranberry. The odour of valerianic acid is, however, so strong in these berries, which are not uncommon in this country, that the taste for them must surely be an acquired one. Another paper by the same author, describes the root *Pterocaulon pycnostachyum*, Ell., the *black root* of Georgia, where it is used as an alterative. The other two drugs, *Ledum latifolium* Ait, and *Dioscorea villosa*, L., are not new, an account of the former being given in 'Redwood's Supplement to the Pharmacopœia' and of the latter in 'Wood and Bache's Dispensatory.' The inconvenience of the same name being used for distinct drugs in different States is well illustrated in the black root, this name being applied to *Actæa racemosa*, and to *Leptandra Virginica*.

Some samples of dialysed iron examined by Mr. H. Trimble, and purchased in Philadelphia as five per cent solution of ferric oxychloride, showed a variation from 2·514 to 4·831 per cent., not one out of six samples containing the guaranteed percentage. Doubtless it is not an easy matter to obtain a solution of dialysed iron of definite strength, but it evidently behoves pharmacists to examine the strength of this preparation which is so rapidly coming into favour.

Mr. G. W. Kennedy recommends the substitution of alcohol for proof spirit in the formula for the preparation of tincture of cantharides, on the ground that the marc after making the tincture contains cantharidin, and that in consequence the tincture is not so useful for hair washes as it would otherwise be. The author, however, apparently forgets that the tincture is frequently used internally, and that a greater strength, unless the dose be considerably diminished, might be fraught with serious results in making up old prescriptions in which the present preparation is ordered.

In respect to coto bark, which appears to be exciting some interest, a pertinent remark appeared in a recent number of the *Pharmaceutische Zeitung*. According to our contemporary, the "coto bark" originally examined by Jobst, and from which he isolated cotoin, is not met with in commerce, and the bark which came into the market last year under that name was exclusively "Paracoto bark." If this be correct, it follows that the "cotoin" of some price lists must be represented by para-cotoin, which, as stated by Jobst (*Pharm. Journ.* [3], vii., 495), even when freed as much as possible from leucotin and other bodies accompanying it in the bark, is inferior in its anti-diarrhœic action to the true cotoin.

A short time since a recruit to the now much-diminished army of the animal materia medica was announced in the person of the common cockroach (*Blatta orientalis*), which was reported by Russian physicians to possess diuretic properties, and to yield a crystalline body in which these properties were intensified. On the other hand, two other members, also having an ancient reputation as diuretics, but which, in fact, have not done much service in recent years, have just received their *coup de mort* from Dr. Méhu. The well-known crustaceæ, the wood-louse, (*Oniscus asellus*, L.), and the armadillo (*Oniscus armadilla*, L.), which were official in the older London Pharmacopœias and were sometimes divided into "wild" and "domestic," are still included in the list of *substances naturelles* of the French Codex, which also gives instructions for the preparation of a powder from them. They are but seldom met with now in French pharmacy, however, and the limited demand for them is supplied from Italy. The ancient medical reputation of these little crustaceæ was based upon the supposition that they contained a large proportion of nitrates obtained from the detritus in which they find their food. To test the truth of this Dr. Méhu has been making some experiments. He finds that the *Oniscus armadilla*, after drying at 100° C., by which it loses 2 to 6 per cent. of water, contains about half its weight of mineral matters, and the *O. asellus* one-third. The tegument is especially constituted of calcium carbonate. The ash includes about 8 per cent. of ferruginous silica and 6 per cent. of alumina. There were also obtained 1 per cent. of sodium chloride, $\frac{1}{10}$ per cent. of potassium chloride, a very small quantity of calcium phosphate, but no nitrates. The ash was slightly alkaline. Treatment of the armadillo with ether removed about 1 per cent. of oil containing chlorophyll. Dr. Méhu concludes that the employment of these animals is a remnant of the superstition of a past age, a justification for which is not found in modern therapeutics, and that the wood-louse and its congener should therefore be erased from the next French pharmacopœia.

In a paper communicated to the Faraday Club, Mr. G. E. Davis gives * a number of determinations of the nitrogen compounds present or liable to be present in commercial oil of vitriol. The method employed is a modification of Walter Crum's mode of estimating nitrates in potable water, and consists in agitating 1 c.c. of the acid to be tested with an excess of pure strong vitriol in a measured tube suitably provided and contained over mercury. By this proceeding the mercury reduces the teroxide and tetroxide of nitrogen to the form of nitric oxide, and the whole of the nitrogen compounds being thus obtained in a common gaseous form, nothing remains but to read off the volume and apply the usual corrections.

By the way, it may be added that the Faraday Club is a semi-social, semi-scientific association of the principal chemists in the Lancashire alkali district, and has its head quarters at St. Helen's.

C. A. Burghardt, Ph.D., in a communication made to the Manchester Literary and Philosophical Society, shows that when finely powdered iron pyrites is heated with pure water in sealed tubes to 120° C. for some hours, ferric and ferrous sulphates are formed, also free sulphuric acid and ferric oxide, along with sulphuretted hydrogen. From this experiment he concludes that sulphuretted hydrogen can be produced in the interior of the earth without the intervention of organic substances, inasmuch as all rocks contain more or less iron pyrites disseminated throughout them, and are also saturated with water.

Jörgensen describes † a proto-sesquioxide of platinum obtained by heating anhydrous sodium platinochloride, with dry sodium carbonate in a platinum crucible, at the temperature of incipient fusion. It is a bluish-black powder, not attackable by any of the acids or even by aqua regia. When heated to the melting point of silver it loses oxygen, and is entirely broken up. It is reduced by hydrogen at normal temperatures, with the evolution of light and

* *Chem. News*, vol. xxxvii., p. 45.

† *Journ. prakt. Chem.*, xvi., 342.

heat and the formation of water. It yields platinum black when gently heated with formic acid, carbonic anhydride being simultaneously evolved.

Imitating some experiments made by Schone, in Moscow, during 1874, Sergius Kern,* of St. Petersburg, has determined the amount of peroxide of hydrogen present in rain water. From a table setting forth the results, it is seen that equatorial winds bring rain much richer in peroxide of hydrogen than polar winds. This is interesting, because it bears out the expectation that in districts where vegetation luxuriates the amount of peroxide of hydrogen in the atmosphere would naturally exceed that to be detected in regions where vegetation does not flourish to the same extent. The author, however, seems to have taken no precaution to eliminate certain sources of error in his determinations, such as, for instance, the accompanying presence of nitrous acid, etc.

Berthelot† has investigated the reducing action of hydriodic acid upon benzene; he finds that the final product consists of hexane C_6H_{14}, while the hydrocarbons, C_6H_8, C_6H_{10}, and C_6H_{12}, are also formed intermediately. From these facts he is led to regard benzene as constituted of three groups of molecules of acetylene, or C_2H_2 (C_2H_2) C_2H_2, the side molecules of which have the power of uniting separately with hydrogen.

In other words, on this view benzene is to acetylene what ozone is to oxygen in a general way, and it is interesting to remember, that when the vapour of acetylene is passed through red hot tubes a cer- amount of benzene is produced, just as a certain amount of oxygen becomes transformed into ozone under the influence of induced electricity.

The aconite alkaloids have again come to the fore in the paper read by Dr. Wright, at the Chemical Society, on the 7th inst. It will be remembered that at the Pharmaceutical Conference in 1875, Dr. Wright gave the name of pseudaconitine to the alkaloid extracted by Mr. Groves from *Aconitum ferox*. To this alkaloid, Wright then assigned the formula $C_{36}H_{49}NO_{11}$, and at the Pharmaceutical Conference in 1877, he stated that this alkaloid readily split up under the influence of hydrating agents into pseudaconine and dimethyl-protocatechuic acid, as follows: $C_{36}H_{49}NO_{11}+H_2O=C_{27}H_{41}NO_8+C_9H_{10}O_4$. In his more recent paper, he alters the formula of pseudaconitine to $C_{36}H_{49}NO_{12}$, and the extra atom of oxygen is allotted to pseudaconine. Dr. Wright also retracts the statement made by him at the Pharmaceutical Conference in 1877, that the alkaloid extracted by Dr. Paul and Mr. Kingzett from Japanese roots was "a mixture of pseudaconitine and the decomposition products thereof." He now finds that the Japanese alkaloid does not yield dimethyl-protocatechuic acid, and hence it is not pseudaconitine.

G. Goldschmidt and H. Weidel‡ have examined the bark and wood of *Quassia amara*, L., and find that on extraction with water, it yields a yellow resinous body from which they failed to obtain a crystalline substance described respectively by Winkle and Wiggers. When fused with potash, the substance in question yields acetic and protocatechuic acids. Latour and Magnier de la Source§ have isolated a yellow crystalline principle from the flowers of the *Tagetes patula*. It has the composition $C_{27}H_{22}O_{13}$, $4H_2O$, and loses the water of crystallization at 100° C. They call the substance Quercetagetin, and rejecting Hlasiwetz's formula for Quercetin, viz:—$C_{27}H_{18}O_{12}$, substitute for it, $C_{27}H_{20}O_{12}$.

C. Tanret* states that the alkaloid ergotinine occurs in ergot of rye in the proportion of about one gram per kilogram. In its pure crystalline form it is insoluble in water, but dissolves in alcohol, ether, and chloroform. Both in the solid state and in alcohol solution it absorbs atmospheric oxygen and turns brown. The alcoholic solution exhibits a green fluoresence.

The salts of ergotinine are said to be decomposable by water, although the sulphate has been obtained in a crystalline state. The author finds that the alkaloid is accompanied in ergot of rye by another substance exhibiting properties like those possessed by camphor.

It was shown in a recent "Month," that the researches of Schiff upon the human spleen had rendered it probable that this organ has nothing to do either with the construction or destruction of the corpuscles of the blood, but that its probable function consists in the elaboration of certain ferment-matters rendered available in the processes of digestion. M. G. Pouchet has also just made a communication about the genesis of red corpuscles to the Société de Biologie. He shows that in certain Selachian fishes the elements of the splenic parenchyma are undistinguishable from certain corpuscular elements contained in the blood, and hence he conjectures in opposition to the above view, that the spleen is concerned in the genesis of the blood corpuscles. That the corpuscular elements in the blood of the fishes alluded to ultimately become transformed into red corpuscles appears beyond doubt, but M. G. Pouchet does not seem to have established this to be true of the splenic elements resembling them.

Prof. Binz, of Bonn, and some of his assistants, have recently re-examined† the question of excretion of alcohol by the kidneys and lungs, using Geissler's vaporimeter for the detection of traces of alcohol. This instrument will allow of the detection of as little as 0·05 per cent. alcohol. The authors found that patients suffering from various febrile disorders, excreted by the kidneys during the eight or nine hours after doses of alcohol had been given, not more than 3·1 per cent. of the total quantity, and in some cases no alcohol could be found. It also appears from these experiments, that practically no alcohol escapes by the breath even when large quantities are taken, and hence it is concluded that by far the larger part of the alcohol is burnt up in the body in the processes of metamorphosis of the tissues. This is of course a well-known fact, but its confirmation at this time is not inopportune.

Baumann‡ has published a few more facts about the formation of indican and phenol in the system. Originally, Schunck stated that the body which is present in urine, and from which indigo blue may be obtained, was identical with the indican which he had extracted from certain species of indigoferæ. Thudichum, many years ago, controverted this opinion by showing that the "indigogen" or indigo-blue forming substance in the urine was not a glucoside. Baumann, some time since, confirmed this view, and now he adds a further confirmation to it

* *Chem. News*, vol. xxxvii., p. 35.
† *Compt. Rend.*, lxxxv., 831.
‡ *Wien. Akad. Ber.*, lxxiv., 389—390.
§ *Bull. Soc. Chim.* (2), xxviii., 337—342.

* *J. Pharm. Chim.*, xxvi., 320—324.
† *Archiv. f. Exper. Pathologie*, vi., 287.
‡ *Zeitsch. fur Physiol. Chem.*, i., 60.

on the basis of experiments which lead him to the conclusion that the substance in the urine is a conjugated sulpho-acid.

Baumann also finds phenol to be an oft occurring ingredient of the urine of dogs fed exclusively on flesh meat, and inasmuch as he finds phenol is invariably produced when fresh fibrine is exposed to prolonged digestion with pancreatic tissue, he concludes that that found in the urine comes from the disintegration of albumen in the system.

Notwithstanding the light thrown upon the history of racemic acid by the brilliant researches of Pasteur, the conditions under which it occasionally makes its appearance during the manufacture of tartaric acid have never been satisfactorily elucidated. It is generally accepted that the racemic acid is present in the crude tartar coming from particular districts. But this explanation is not always sufficient; as, for instance, when tartar, taken from the same lot, and worked in different manufactories, yields in one place racemic acid, and in the other none. Dessaignes and Jungfleisch found by experiment that under the influence of heat ordinary tartaric acid is readily transformed into inactive tartaric acid and racemic acid, and the latter chemist thought to find in this fact an explanation of the production of racemic acid. But observations continued through many years upon mother liquors from various tartaric acid factories showed that, although more or less inactive tartaric acid was present in all of them, racemic acid was not, even where they had been subjected to prolonged treatment, and its occurrence in appreciable quantity was confined to a small number of specimens. In fact, some samples of mother liquor from factories where evaporation was carried on in a partial vacuum contained more racemic acid than others from factories where evaporation was carried on over a bare fire. Recently, Jungfleisch noticed that the liquors richest in inactive tartaric acid were also rich in alumina, and the suspicion that alumina favoured the conversion was confirmed by direct experiment; also that the neutral aluminum sulphate has but little action. Jungfleisch has come to the conclusion that when there is an accumulation of alumina in the mother liquor, the conditions are favourable for the production of a large proportion of inactive tartaric acid, and a small proportion of racemic acid, although when the latter is present in considerable quantity it becomes the most manifest through its comparative insolubility. Examination of liquors from which racemic acid has been deposited has always shown them to contain much inactive tartaric acid. This theory does not exclude the probability that certain vines under particular conditions produce racemic acid.

F. Frachoel, writing to the *Chemical News*,* points out the interesting fact that in Switzerland there is a custom of filtering milk, as soon as it is drawn, through a bundle of washed fir-tips. In this way a film of deposit consisting of hairs, skins, clots, &c., is formed on the spicular leaves and thus the milk is not only freed from these, but it appears to acquire the property of resisting the lactic acid fermentation for a considerable time longer than milk not so treated. In fact the milk becomes faintly aromatised—that is to say, enough of the resinous matter of the fir-tips is dissolved into the milk as is required to preserve it from change to a certain extent.

Now that the power of compressing gases is a subject attracting so much attention, *London Society* tells a very funny incident also bearing on the subject and on bottled beer. Fuller, who relates the story cited by *London Society*, says that in the reign of Queen Mary, Alexander Nowell, while master of Westminster school, went fishing one day, and took some beer in a bottle, which, owing to a combination of circumstances, he left near the bank of the river. Upon the accession of Elizabeth he returned to this spot and found "no bottle, but a gun, such was the sound at the opening thereof."

According to some statistics recently published, the production of wine in Italy during 1877 amounted to no less than 28,880,300 hectolitres, or at the rate of 1·03 hectolitre per head of the population. Wine-growing in Italy is not, however, of the importance that it might assume under better management and more scientific treatment. Moreover, while as a matter of fact many of the wines there grown will not keep, scarcely any of them are wines of a definite character. The government seems disposed to give some attention to this industry, in which case better things may come about in relation to its importance.

The *Lancet* adds another item to its list of good services by calling attention in a special report to the contamination of uniforms provided by the army clothing depot in the fever-dens, in which many of the workpeople live and make the clothes worn by our soldiers. Many of the facts elicited by the commission are repellant enough, and it is a marvel that while all the world is talking itself to death with sanitary science some more definite steps are not taken to remove the evils which exist in the very heart of London.

Before dealing with the "Dispensing Memoranda" that have appeared during the past month it will not be inappropriate to quote a passage from the paper read before the Glasgow University Medical Chirurgical Society on the Relations of Pharmacy to Medical Students, by Mr. John Edmund Fairlie, which was published in a recent number of this Journal. The author says, "I am convinced from what I have seen, that a pleasant looking and elegant preparation will go a long way in helping its efficacy, and the apathy and disgust often evinced at the taking of ugly medicines must have a great counteracting effect upon their curative properties. Among these I might mention nauseous oils and resinous juices not made into a proper emulsion; too large powders, pills, etc.; resinous tinctures mixed with water, etc."

These observations, emanating from a member of the medical profession, deserve our careful attention; although intended mainly for the prescriber, they apply equally to the dispenser of medicines, who, taking the Pharmacopœia as his standard for the preparation of the several remedial agents contained in it, has also to carry out faithfully the intentions of the prescriber in the compounding and dispensing of prescriptions.

An experienced dispenser should in most cases be able to state that with certain combinations a departure from the normal condition will eventually take place; it may be a change of colour or a separation. He should be in a position to anticipate the changes which must sooner or later occur, and to explain the reason when it is called in question. This is the result of experience acquired by long practice, but the extent of practice usually necessary may be much limited by the dispenser's

* Vol. 37, p. 50.

intelligent and careful attention to details, assisted by suggestions freely placed at his disposal.

Taking the Memoranda as usual in their numerical order, in No. 59 the composition of an article called "Pandrodyne" is required. Without seeing the original prescription it must be assumed that this name is correctly given; the article has not before been met with, therefore its composition cannot be supplied; it may be the obscure ingredient of one of those prescriptions which are intended to be as dead letters to all but the fortunate men who are in the secret. Referring to mythical practices and mythical prescriptions, Mr. Fairlie again says, "I have been told that arrangements exist between some physicians and chemists whereby a percentage is allowed the doctor for every prescription sent. The physician presents the prescription to the patient in an envelope with the chemist's name and address, remarking that it is the only shop where it can be properly made up, and even resorts to the writing of mythical prescriptions in terms which the chemist alone knows," and adds, "such practices I would stamp as downright conspiracies against the public, and both doctor and chemist ought to be punished by law." Many pharmacists are on this subject quite of his opinion.

No. 60. This prescription contains a rather large quantity of copaiba for a pill mass, with rhubarb and carbonate of magnesia; when made up the mass is too soft for retaining its shape after being rolled into pills. The copaiba may be partly solidified by the addition of magnes. calc., as in the creasote pill, but a better result will in this particular case be obtained by the addition to the copaiba of about half its weight, or less, of slaked lime, allowing a little time for solidification.

There may be a difference of opinion as to the propriety of adding calcined magnesia or slaked lime to solidify copaiba, but with our present knowledge there seems no equally satisfactory alternative. It would be a very proper course for the dispenser to submit to the writer of the prescription a sample of the mass made as prescribed, with another solidified by the best known means. It would need little argument to convince him that the former cannot be dispensed in a pilular form, and perhaps not much more to induce him to sanction the suggested addition. Very few of the medical profession who write prescriptions have had an opportunity of acquiring a practical knowledge of dispensing, and it must be a matter of astonishment to a careful observer that the errors in this respect, though met with occasionally, are comparatively rare.

No. 61 refers to some points in the manufacture of Ung. Hyd. Nit., B.P. The inquiry is "if it is proper to heat the *solution* of mercury in nitric acid until the reddish-brown fumes cease to be given off?" This mode of procedure would be incompatible with the B.P. directions. "Dissolve the mercury in the nitric acid with the aid of a *gentle* heat," and further, while the mixture of fat and oil is hot "add the solution of mercury."

According to Dr. Pereira, the theory of the process is as follows:—"By the mutual action of mercury and strong nitric acid, a nitrate of the binoxide as well as of the protoxide of mercury is formed, whilst binoxide of nitrogen is generated. Part of the latter escapes, and combining with atmospheric oxygen forms nitrous acid; the remainder acts on the free nitric acid, and forms with it hyponitrous acid, or nitrous acid." Whatever the theory of the process may be, practically, it is no easy matter to make this ointment of uniform colour and consistence. The ointment, whilst of good colour, usually contains free nitric acid, and many pharmacists are of opinion that the value of this preparation, as an application to the eyes, has in some measure been sacrificed to its appearance.

No. 61. Should a Belladonna Plaster have an adhesive margin? It is not usual, neither is it deemed necessary to make an adhesive margin to the belladonna plaster prepared in accordance with the B.P. directions. This view can only be adopted when no instructions are given in the prescription, but it frequently happens that the writer indicates his wish that there should be an adhesive margin. In that case the dispenser has no option; he must follow his instructions. But when no special intimation to this effect is given, a dispenser would be justified in sending out a belladonna plaster spread on leather and without an adhesive margin.

The duties of a pharmacist are two-fold. In the first place he has to satisfy himself that every preparation is properly made and also properly preserved for use. In the second place that those preparations be accurately dispensed in accordance with the prescriptions of the several branches of the medical profession. If the former be neglected no amount of accuracy in dispensing will secure uniform results, and if the latter be carelessly attended to, or conducted without a fair amount of intelligence, all the advantages of scientific training which may have been reasonably expected to result in success, will be neutralized.

The current number of the *American Journal of Pharmacy* contains a report of an incident that is worth mentioning in connection with the subject of explosive mixtures, which has more than once been referred to in the "Dispensing Memoranda." A druggist having dispensed a prescription for nitromuriatic acid and tincture of cardamons, handed the mixture to the messenger, who was in the act of putting it into his pocket when he was startled by the bursting of the bottle and the scattering of the contents over his clothes. Like Bruce's spider, the druggist tried again, and handed his second product to the messenger with the caution that he was not to shake it. This injunction, intensified by the bearer's own experience, postponed the *dénouement* until the bottle reached the patient's hands, when the cork was violently expelled, and acid and fumes spirted up into her face, nearly destroying her eyesight and causing several days' suffering. The editorial conjecture is that the acids were mixed and put into the bottle without waiting for the consequent reaction to take place!

A subject that has often attracted the serious attention of the pharmacists on this side of the Atlantic, as to the propriety of educated pharmacists using coated pills, fluid extracts, and other preparations obtained from wholesale manufacturers, was warmly discussed at a recent meeting of the Alumni Association of the Massachussetts College of Pharmacy. The general feeling was that the use of all articles of which the quality cannot readily be tested by the pharmacist should be discouraged. On the other hand, it was contended that the advantage resulting from manufacturing on a large scale might be retained by paying to respectable manufacturers a fair price for their goods.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 23, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

COUNTER PRACTICE.

THE letters which have passed between the Solicitor of the Apothecaries' Company and the Solicitor to the Pharmaceutical Society will doubtless have been read with much interest by the great majority of the chemists and druggists in this country, and we venture to believe that they will very generally be regarded as furnishing a satisfactory solution of a difficulty which has naturally caused considerable uneasiness. We have so often given expression to the opinion that the exercise of mutual forbearance and friendly consideration, is the only mode of dealing satisfactorily with the vexatious questions relating to the demarcation between medical practice and pharmacy, that we can consistently congratulate our readers upon the result that has been arrived at. We believe moreover that with the exception of a small section of the medical profession, comprising by no means the most influential or important members of that body, the substitution of a conciliatory policy by the Apothecaries' Company and the Pharmaceutical Society, for the ill-advised contest provoked by the Medical Defence Association, will be very generally regarded as consistent with the existing relations of medical men, pharmacists, and the public. Indeed, we believe that all reasonable men, whether medical or pharmaceutical, would agree in the opinion that, in regard to those relations, no strict rule can be laid down as to what is proper or improper; but that, under the guidance of mutual respect and consideration between medical men and pharmacists, the individual judgment of those concerned is the best means of preventing interference with the functions of either class.

Considering the importance of the subject, not only as the interests of a great number of chemists and druggists are at present concerned, but also in regard to the maintenance of cordial relations between the trade and the medical profession, we think it desirable to call the attention of our readers to the main points which have been so far settled in accordance with the general principle expressed in the brief statement published in the report of the Council Meeting held last January.

In the first place the Solicitor of the Apothecaries' Company states that he considers it unlikely that the Court will accept the suggestion of Mr. FLUX on behalf of the Pharmaceutical Society to have a test case of simple counter practice tried with the view of settling any question as to its legality. This alone might be regarded as a practical concession of the point at issue. But in addition to this the Act of Parliament Committee of the Apothecaries' Company, after considering the subject, distinctly disclaims having given authority for any attack upon counter practice as well as the intention of doing so, and the correspondence published on page 634 makes it clear that while the Medical Defence Association, in making its attack upon counter practice, has obtained from the Apothecaries' Company authority to use its name by means of a statement of allegations outside counter-practice, it has not in using that authority, relied upon the allegations which were of the gist of the statement on which the authority was obtained. On the contrary, the Association has given evidence merely of counter practice, and finding the County Court judges disposed to regard the attack upon counter practice as being deliberately made by the Apothecaries' Company—the nominal plaintiff in the action—it has been contented to leave the case to stand upon the evidence of counter practice and to take the judgment upon that.

We are not in a position to say how this has been managed, but that it was the case is the only possible interpretation that can be put upon the very specific statements made by Mr. UPTON that the Act of Parliament Committee of the Apothecaries' Company is "unable to discover any case wherein the sanction of the Society has been given to a prosecution on a pure and simple case of counter practice," and again that he has "not authorized any prosecution in a case of pure and simple counter practice." It is perhaps unfortunate that this complication of the matter has arisen, and it shows the necessity of caution in delegating to another body such powers as the Apothecaries' Company possess. In the absence of any statement of the allegations outside counter practice, it is impossible even to conjecture whether there was sufficient foundation for them, but whatever may have been the nature of the representations made by the Medical Defence Association to the Apothecaries' Company, the result has been to make the Company appear in a position at variance with its expressed intentions.

As regards the future it may fairly be inferred that the unlimited leave given by the Apothecaries' Company concerning the use of the letters written on its behalf by Mr. UPTON, would extend to their production in any action in which counter practice might be called in question. This is, we think, a very important result of the communication between the Solicitors of the Society and of the Apothecaries' Company, for it virtually stands admitted that the Company practically does not and will not question that counter practice is within the exemption of the clause in the Act of 1815. In face of this positive declaration it seems to be comparatively of little moment that the Act of Parliament Committee refrains from expressing any opinion as to whether cases of counter practice come within the Act of 1815 or not.

While, therefore, any grounds for apprehension that counter practice will be interfered with may be regarded as practically removed, there is another aspect of the matter which appears to render the amicable settlement of the question far preferable to the appeal to a legal tribunal. It must not be forgotten that the decisions given in cases which have been tried are in favour of the view that counter practice is within the Act of 1815, and this circumstance is referred to by the Act of Parliament Committee of the Apothecaries' Company. Again, in view of the restrictions imposed upon all kinds of professional practice, which it is the tendency of the present time to enforce and extend, it may be questioned whether any legal tribunal would give a decision at variance with this tendency, at any rate without qualifying it with onerous conditions.

Whether in any further trial of Shepperley's case the plaintiffs will seriously raise the question as to counter practice remains to be seen. But it is a matter of clear inference from the letters that there was laid before the Apothecaries' Company a statement of alleged infringement of the Apothecaries' Act outside of counter practice, and it would be contrary to all ordinary experience if at any future trial, evidence as to those other facts were not given and relied upon, in which case it might appear that a conviction would result without counter practice being seriously in question upon that verdict.

As regards the question what constitutes counter practice, we do not think that chemists and druggists generally are called upon seriously to consider this question in the strictest sense. The law cannot extinguish human nature, and it is not in human nature for any man to refuse words of counsel and recommendation on the sale of an article in the way of his business, or on a sudden emergency. The force of this truth was not long since very humorously illustrated in one of the comic journals in a manner which exposed the absurdity of the demands made by a small section of the medical profession, who would restrict the action of the chemists and druggists to the mere mechanical details of vending drugs and dispensing medicine.

What chemists and druggists as a body would take a stand for and what, in fact, they really mean is expressed with fair accuracy in the solicitor's letter in the following words:—"I also mentioned having stated to you that my clients, whilst regarding counter practice as a public and trade necessity, protected by the twenty-first section of the Apothecaries' Act of 1815, did not encourage it and had no intention at variance with discouraging its exercise further than unavoidable." It will be observed, however, that the solicitor's letter did not attempt to defend any holding forth, by advertisements, handbills, sign or otherwise, that the chemist and druggist gives advice or practices medicine, or engages in any practice outside of counter practice.

SCHOOL OF PHARMACY.

The courses of lectures on "Chemistry and Pharmacy," and "Materia Medica and Botany," in connection with the Pharmaceutical Society's School of Pharmacy, 17, Bloomsbury Square, will recommence on Friday, March 1, when Professor Bentley will give his first lecture on Botany. Students who have but a limited time at their disposal will find the ensuing five months to be a favourable period for studying at the School, for between the 1st of March and the end of July they will have the opportunity of attending not only in the Laboratory and at the usual courses on Chemistry and Pharmacy and Materia Medica and Botany, but also the summer course on Systematic and Practical Botany which is delivered at the Royal Botanic Society's Gardens, in Regent's Park, where every opportunity will be afforded to them of obtaining a practical acquaintance with plants.

THE DENTAL PRACTITIONERS' BILL.

The second reading of this Bill was moved in the House of Commons on Tuesday last by Sir John Lubbock, who said its object was to protect the public by limiting the use of titles which would imply that the persons using them had special dental qualifications. The motion was opposed by Dr. Cameron and other members, and eventually, after two divisions, Sir John Lubbock consented to the postponement of the second reading until the 5th of March.

With respect to the ambiguous words that have attracted so much attention as being likely to affect the interests of persons practising dentistry in conjunction with the business of a chemist and druggist, we have reason to believe that the difficulty will be removed by their withdrawal.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association will be held at 17, Bloomsbury Square, on Thursday evening, February 18, at 8 o'clock, when a "Note on Some Substances Employed in Perfumery" will be read by Mr. C. J. Mead; and a note on "Blatta Orientalis, its Use and Preparations," by Mr. J. Hart.

THE CHEMISTS' ASSISTANTS' ASSOCIATION.

It will be seen by a reference to our advertising pages that on Wednesday next a Soirée in connection with the Chemists' Assistants' Association is to be held at the Quebec Institute, Baker Street, W.

LEGACY TO THE BENEVOLENT FUND.

In connection with the Benevolent Fund, we are informed that the Secretary has received, through Messrs. Kay, of Stockport, acting as executors, the sum of £100, less legacy duty, in accordance with the terms of the will of the late Mr. Stephen Carr Sagar, chemist and druggist, of Swinton.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

February 13, 1878.

Present—Mr. Williams, President; Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, Taylor and Umney.

MAJOR EXAMINATION.

Eleven candidates were examined. *Five* failed. The following *six* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Atkins, William Ralph ....Salisbury.
Branson, Frederick Woodward..Northampton.
Cullingford, Louis James ......Bletchingley.
Curtis, Frederic George ....Dorchester.
Miller, Cecil Bradley ....Wellingborough.
Redford, George Alfred .. ..Liverpool.

MINOR EXAMINATION.

Ten candidates were examined. *Three* failed. The following *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Ascott, Tom ....Exeter.
Ashweek, John Sydney ....Torquay.
Budden, George Alfred ....Wareham.
Hawken, Alexander...............St. Austell.
March, Richard ....Stamford.
Need, John ... .Great Malvern.
Thomas, John Edward ....Swansea.

MODIFIED EXAMINATION.

Three candidates were examined. *Two* failed. The following passed, and was declared qualified to be registered as a Chemist and Druggist:—

Hadley, James William ....London.

February 14, 1878.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, Taylor and Umney.

Dr. Greenhow was present on behalf of the Privy Council.

MINOR EXAMINATION.

Twenty-three candidates were examined. *Fourteen* failed. The following *nine* passed, and were declared qualified to be registered as Chemists and Druggists:—

Albright, Alfred ....Bootle.
Attree, William ....Southampton.
Brumwell, Herbert ....Fleetwood.
Challinor, Cedric ....Bolton.
Hall, Richard Arthur ....Leigh, Lancashire.
Jones, Henry Stevens, jun. ....Fulham Road.
Lockyer, William Walter ......Deptford.
Skelton, John Hardy ....Gainsborough.
Stobbs, Robert ....North Shields.

February 15, 1878.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall, Taylor and Umney.

Dr. Greenhow was present on behalf of the Privy Council.

MINOR EXAMINATION.

Twenty-one candidates were examined. *Nine* failed. The following *twelve* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bambridge, Arthur John ......Lancaster.
Boor, Jonathan.....................Manchester.
Brothwood, Harry Skarratt ...Shrewsbury.
Chapman, Leonard Parker ......Rochdale.
Corlett, Edwin ....Ramsey.
Crook, Arthur Williams ....Preston.
Davies, Thomas .... Newcastle Emlyn.
Hoare, William Parker ....Cirencester.
Hobson, Charles, jun. ....Windsor.
Jones, George ....Bedford.
Moody, Thomas Sullivan.........Lowestoft.
Murison, John ....Fyvie.

PRELIMINARY EXAMINATION.

The undermentioned Certificates were received in lieu of the Society's Examination:—

Certificates of the College of Preceptors.

Acton, Frederick George.........Worcester.
Lewis, Frederick William ......Hereford.

Certificates of the University of Cambridge.

Cosford, Frederick Robert ......Brighton.
King, Arthur......... ....Norwich.
Sharpe, William Cecil ....Madeley.

Certificate of the University of Oxford.

Joint, Francis ....Barnstaple.

PHARMACEUTICAL MEETING.

Wednesday, February 20, 1878.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

A special Evening Meeting was held on Wednesday last, when Professor Redwood delivered a lecture on "Spectrum Analysis." The lecture, which will be published in the next number of this Journal, was illustrated by spectra thrown on a screen by the electric light and by numerous experiments, in the manipulation of which the Professor had the assistance of Mr. T. Boverton Redwood and Mr. T. Horne Redwood. At the close of the lecture, upon the proposal of the Chairman, a hearty vote of thanks was given to the Lecturer.

The following is a list of the Donations to the Museum during the past three months:—

Pot in which Curari is imported, from Messrs. Hopkin and Williams; Native Cinnabar, from New Almaden Mine, California, from Mons. C. Chantre; Ndilo Oil obtained by expression from the seeds of *Calophyllum inophyllum; Grindelia robusta*, from Messrs. Corbyn, Stacey and Co.; *Grindelia robusta*, from Mr. W. Martindale; specimens of Podophyllin, from Dr. A. Senier and Mr. A. J. G. Lowe; specimens of Salicylic Acid and Salicylate of Soda from Oil of Wintergreen, from Messrs. Hopkin and Williams; specimens of Amyrin, Bryoidin and Elemic Acid, from Professor Flückiger; specimen of *Cinchona calisaya* and the var. *Anglica* in blossom, from Mr. J. E. Howard, F.R.S.; a large and perfect octahedron of common Alum crystallized with Chrome Alum; a large prismatic crystal of Sulphate of Magnesium, having reversed dihedral summits, and a very perfect prism of Ferricyanide of Potassium, from Mr. W. Copney; specimen of Mogador Colocynth, from Messrs. Hearon, Squire and Francis; specimen of Absolute Phenol, from Messrs. Bowdler and Bickerdike; specimen of the Monochloride and Trichloride of Iodine, from Mr. W. R. Dunstan; specimen of Dragonwood, from Mr. Curling; specimens of Oil of Rose Geranium, as described by Professor Dragendorff, of Ammoniated Glycyrrhizin and of Nigella seed, from Mr. H. W. Langbeck; specimen of Poppy-head and of Opium, from China; specimen of Mahwah Flowers, from Mr. T. Christy; specimen of Iron Slag tinted with Manganese, from Mr. W. Y. Brevitt; specimen of Brazilian Copal, from Mons. C. Chantre; specimen of Senna Leaves (*Cassia obovata*) from India, from Dr. Forbes Watson, India Office; specimen of the root of *Scorodosma fœtidum*, from the Curator.

NORTH BRITISH BRANCH.

The fourth meeting of the present session was held in the Society's rooms, 119A, George Street, on the evening of Tuesday, 12th February.

Mr. J. B. Stephenson, President of the Branch, in the chair.

A paper was read, entitled—

Quinine, a Physiological Antidote to the Malarial Poison.

BY FRANCIS MOINET, M.D., F.R.C.P.E.,
Lecturer on Materia Medica and Therapeutics.

The most important and ancient of the uses of quinine depend undoubtedly on the power it has over malarial diseases, both as a prophylactic and curative agent, a power which has not as yet been explained by our knowledge of its physiological action, but which is so evident, that by many it is considered a specific for these diseases. That it is not a specific we need hardly say, unless the term may be applied to a remedy whose powers we know, but of whose mode of action we are ignorant, because it does not always act as a prophylactic when taken as a preventive, nor is it always curative, which would not be the case were it a true specific. But so interesting a problem as the action of quinine in these diseases has naturally brought forward several theories to explain its action. The theory of its specific action hardly deserves the name of such, on account of its improbability ; other theories however, have been adduced of a much more plausible and rational character. Thus, Piorry, Mosler, and others, explain the influence of quinine by an action on the enlarged spleen, viz., that the effect it produces upon the fever is in proportion to the reduction of the spleen, that the disease is cured simultaneously with the subsidence of the splenic enlargement, and that the fever is apt to recur as long as the spleen exceeds its normal size. This enlargement or engorgement of the spleen and other organs is, however, only a secondary phenomenon, and is a result, and not the *origo mali*, as Piorry and his followers aver, who declare the spleen to be the primary seat of the disease. Thus, according to Jacquot, Saurier, and others, people are said to die of malarial fever in Africa without the slightest swelling of the spleen. A singular case is also related, in which a man received an extensive wound of the wall of the abdomen on the left side, through which the spleen escaped ; as it could not be returned it had to be removed. The patient recovered from the operation and had malarial fever afterwards, just the same as before, although eventually a *post mortem* examination showed nothing but the shrivelled rudiment of the spleen left.

Besides, M. Piorry's assertion as to the diminution of the size of the spleen after a dose of quinine has been disproved by many careful cliniciens, and other investigators have failed in their attempts to reduce the size of the spleen in dogs by giving quinine as Kuchenmeister and Mosler declare they did; so that even granting the enlarged spleen to be the cause of the disease, the action of quinine in diminishing its size remains yet to be proved, or rather has been disproved. Besides, in some cases of these diseases, the spleen is not enlarged and yet they are cured by quinine, and in others the fever disappears before the enlarged spleen is reduced in size. Hence, at the present day, M. Piorry's theory is generally held to be untenable, as it is founded on false premises.

Then Professor Binz advanced his theory, taking first for granted the germ theory of malarial poisoning, and arguing from the effects of quinine on the white blood corpuscles, that in malarial fever it acts as an irritant to those germ cells, and so renders them incapable of further development and thus arrests and cures the disease, and by its action on the white corpuscles, destroying them, it diminishes their number, diminishes the functional activity of the spleen, and as a result the organ diminishes in size.

But this theory is based, as it appears to us, upon rather an unstable basis. First, because Binz takes for granted that quinine acts on the white corpuscles in the body as it does out of the body, his experiments not being received as at all conclusive on this point. Besides, the action of quinine in checking the movements of the white corpuscles is much more probably the result of an action on the walls of the capillary vessels, causing them to contract and so preventing the escape of the white corpuscles than on the corpuscles themselves. As no doubt in relaxation of the capillaries approaching stasis the white corpuscles pass readily through the walls of the vessels, and by increasing arterial tension this can be prevented without implying a direct action on the corpuscles.

For this reason Harley is strongly of opinion that the beneficial influence of quinine in ague, and the removal of the splenic swelling, must be attributed to this effect on the blood vessels, by which the congestion is relieved, rather than to a restraining influence on the white corpuscles or leucocytes, as they have been termed. Harley's theory is certainly more probable than that of Professor Binz, because, as he says, if the white corpuscles were a species of entozoa, capable of an independent existence like the infusoria, then a direct action of quinine might be possible. But as we have already said, however desirable it may be to reduce the splenic enlargement, it is not the cause of the disease, and hence treatment directed with this view does not relieve the symptoms of the fever, although it may benefit the local complication. Nor is it apparent that arterial relaxation is more marked in malarial than in other fevers, by modifying which relief from the symptoms may be expected.

Secondly, he takes for granted, what is still unsettled, the germ theory of malarial poisoning.

Thirdly, that on this hypothetical poison, quinine must act as it does on some other germs or on the white blood corpuscles. That in fact quinine is a chemical antidote to the malarial poison. But its effects in these diseases do not support this idea, as we shall immediately see. As to its action on the spleen, that is of little consequence, as of course if the theory fails in the first part, its mode of action in regard to the enlarged spleen must also fall to the ground. All the more so as we have already seen that the beneficial effects of quinine in these diseases are not the results of an action on the spleen. Hence, neither the theory of M. Piorry, of Professor Binz, nor of Dr. Harley, is sufficient to account for the good results which follow the administration of quinine in malarial poisoning.

But by noting the symptoms of malarial fever, and the clinical experience of its treatment with quinine and other remedies, and by examining the action of quinine and other remedies on the nervous system, we might, we think, get some further light on its action, rather than by confining our attention merely to the more common manifestations of its physiological action.

For, by noting the results of treatment, we are often able to explain the action of remedies, in the same way as a knowledge of the action of some remedies in disease has assisted us to a better understanding of the nature of these diseases. So, on the other hand, there is no reason to doubt but that a knowledge of disease and the effects of remedies will often throw light on their physiological action, and explain the *modus operandi* of their curative powers, which is not always apparent from their action in health.

When quinine is administered in malarial fever the beneficial effects which follow cannot be due to it having the power of eliminating the poison from the system, as it has no evacuant action by the bowels, kidneys, or skin. Nor is there any evidence that the symptoms of malarial fever are due to structural changes of any organ, as the spleen, by acting on which quinine might prove curative.

It must, therefore, act in the system, either on the paludal poison itself, by destroying it or paralysing its power, or by an antagonistic action on the nervous system, protect it from the shock of the poison, and so prevent or modify those symptoms which are the usual manifestations of the disease. That is to say, quinine must be either a chemical or physiological antidote : in the one case the poison itself is attacked by the remedy ; in the other the nervous system, at least that part of it which is the seat of selection by the poison, is braced up, so as to resist its power in whole or in part, according to circumstances.

That malaria is a poison cannot be doubted, although of its precise nature we are ignorant, and which by entering the blood gives rise to certain defined and well marked symptoms.

The first of these two theories, viz., that of its being a chemical antidote, is almost analogous to that of Professor Binz, and of which we have already seen there is not sufficient proof. Still, the fact of quinine being a chemical antidote might remain, although Professor Binz's theory be untenable, as it is more properly speaking simply an explanation of its action as a chemical antidote. Hence additional proof is required to refute the idea of its being a chemical antidote in any way.

This idea of its antidotal power appears to be in considerable favour with Stillé, who says, "Admitting that a morbid element in the blood is the immediate cause of the paroxysms of periodical fever, some such cure appears to be most consistent with probability." That it is not most consistent with probability we will endeavour to show, and also that the theory of its being a physiological antidote is the most consistent with probability, as we, like Stillé, believe that the effect of quinine can only be explained by the supposition that quinine elimininates, destroys, or renders inert or inoperative some noxious principle contained in the blood. A strong argument against its power as a chemical antidote is that it and other antiseptics which have been given to cut short or to protect the system from diseases resulting from a poison in the blood have failed.

Thus carbolic acid, sulphurous acid, and corrosive sublimate, which are powerful antiseptics when outside the body, when administered in such diseases as scarlet fever, small pox, typhus, typhoid, or relapsing fever, in which diseases a poison undoubtedly is present in the system, do not possess any antidotal power. Thus the carbolate and hyposulphite of soda, which are readily decomposed in the system into their respective acids and bases and so allow the acids to exert their peculiar power, have not, in my experience at least,—and which can be corroborated by many practitioners,—shown themselves to possess any power of either acting as prophylactics, or cutting short the duration of the disease or diminishing the mortality. That a poison is present in the blood in these diseases has been demonstrated at least in small pox and relapsing fever. Besides, in the recently published results of Dr. J. V. Laborde's experiments on the preventive and curative action of reputed antiseptics, he found—in contradiction of the statement of Professor Binz—that quinine when injected in septicæmia, even in the highest doses compatible with life, neither acted as a preventive to the development of the disease nor averted it when it was produced. There is no reason to believe that quinine has any more affinity for the malarial poison than it has for the poison of these other diseases, and clinical experience supports the opinion.

Besides, the theory of a chemical antidote in such diseases must be received with extreme caution, as it is open to many fallacies: such as, judging from their action outside the body, as to their action in a complex fluid like the blood, and on poisons of whose nature and chemical composition we are ignorant. Also, by the time a fever has developed itself it is very questionable if a chemical antidote would be of much service, as probably the mischief is done by the time the disease manifests itself, viz., that during the period of incubation those changes in the blood and nervous system are brought about and which culminate when this period is brought to a close. Hence to be really serviceable it is probable that a chemical antidote would require to be given at the period of infection, and which by an action then might prevent the development of the disease or modify its future course, while later on it would be useless. But unfortunately, even supposing that we knew of chemical antidotes, it would be almost impossible to make good use of them, as in most cases the patients are naturally ignorant of the time when they received the poison into their system.

And, as I have said, clinical experience does not support the theory of its being a chemical antidote. Thus in malarial fever, although quinine arrests the attacks in some, in others it only diminishes their intensity and sometimes even fails entirely, and always requires to be repeated. This is decidedly against its antiseptic or chemical action, because it is not possible to believe in the power of a chemical antidote which requires to be so frequently repeated as quinine so often has to be, and which sometimes fails, or in a poison which proves itself so speedily active after its apparent destruction, so as to be able to reproduce all its former effects on the economy in so short a time, even after complete removal from the infected district and when no new source of infection is possible. Indeed, the frequency with which quinine requires to be given, and the duration of the disease, notwithstanding its repeated administration, are all insurmountable difficulties in the way of accepting the theory of the chemical action of quinine on the malarial poison, more especially as the secondary lesions are not the cause of the periodical attacks. These paroxysms are perhaps the result of a somewhat similar process to what Heydenreich has shown to be the cause of the relapses in relapsing fever, viz. fresh crops of the germs (*spirillæ*) being cotemporaneous with the fever paroxysms.

That the poison of malaria must have the power of continuing or reproducing itself in the blood is highly probable, both from the duration of the disease and the periodicity of the paroxysms. And if we suppose that quinine arrests a paroxysm by its chemical action on the poison, how is it possible to reconcile this with their continued recurrence after its repeated administration, and it is so far antagonistic to the germ theory of malarial infection, *i.e.*, if quinine is capable of, as Binz asserts, paralysing the irritant miasm by virtue of its antiseptic power or rendering the germs incapable of further development? And certainly there is much more evidence to support the opinion of malarial fever being due to the presence of a poison in the blood than there is in support of the theory of Professor Binz as to the action of quinine. This word paralysing is, however, rather vague and perhaps is meant as an apology for the recurrence of the fever paroxysms and to signify that quinine does not always destroy, but only paralyses for a time, the obnoxious germs.

Surely this expresses a want of confidence in the theory, because after asserting the antiseptic and fatal influence of quinine on such like germs outside the body, Binz argues from that a similar action within the body; and yet if this be true, why does quinine modify what is a fatal action in the one case to a paralysing one in the other, and if it does where is the proof of it? Hence the theory of quinine being a chemical antidote or counter-poison to the malarial poison appears simply untenable, and in the same category we may place the theory of Professor Binz.

The second theory, that of quinine being a physiological antidote, remains to be examined, viz., that by an action on certain parts of the nervous system it diminishes the shock or effect of the poison and thus either prevents or modifies the symptoms which are the manifestations of the action of the malarial poison on these parts. That the nervous system is, in the first place, the principal seat of selection of the poison is generally allowed, both from many of the symptoms of the disease pointing strongly to a direct influence of the malarial poison on the nervous system, and also from the result of treatment, viz., that treatment directed upon this belief is the most powerful and certain in ameliorating the symptoms or curing the disease.

Perhaps, as some believe, an excito-caloric centre is disturbed, whereby intermissions and remissions are produced.

This idea of an action of quinine on the nervous system is compatible with the need of repeating the remedy—which as we have seen Binz's theory is not—as the stimulus of quinine and of all other stimuli to the nervous system can only last a certain and limited time, depending on the dose and the condition of the patient's health, and whether, as in the case of intermittent fever, there is any antagonistic or depressing influence at work. It is not only compatible with repeating the doses, but demands their repetition until the poison is exhausted or dies a natural death, as there is no indication of its being eliminated from the system. From this follows the approved method of administering the remedy before the paroxysm comes on. It also explains what by any other theory is inexplicable, why quinine is sometimes successful, and not always equally beneficial. These results being no doubt due to several causes : to the dose being too small, the use of bad preparations, the varying susceptibilities of patients to the action of the remedy, as is the case with the action of most powerful remedies, and also to the difference in the action and power of the poison in different constitutions and temperaments, the amount of the poison received into the system, the presence or absence of complications or secondary morbid conditions, or to the disease not being correctly diagnosed and being wrongly attributed to malarial poisoning.

Another plea in favour of this theory is that our knowledge of its general physiological action does not explain its effect in malarial fever, unless, according to M. Sée, who ascribes its effects in ague "to its action on the heart, diminishing its force and frequency ; to its action on the peripheral arteries, lowering their tension and producing dilatation ; to its action on the spinal cord and vaso-motor centres, acting as a sedative and diminishing their excitability, and diminishing the temperature of the body." Yet, as he says, it cannot be regarded as a specific or counter poison in the various forms of malarial fever, as it does not prevent malarial poisoning. When taken as a prophylactic, it does not prevent recurrence after a variable period, and it is useless in some of the most fatal forms, especially when the fever tends to assume a continued type. And although this statement of M. Sée's is neither quite accurate in regard to the physiological action of quinine, nor to its power as a prophylactic, it explains what we mean when we say that its action in these diseases cannot be fairly deduced from any of its known or apparent physiological effects, as none of these appear in the smallest degree likely to counteract the action of the malarial poison on the system, if we compare the symptoms of the disease and the known physiological actions of quinine. Besides we have other remedies which act more powerfully in these respects than quinine, and yet which have no curative action like quinine in malarial diseases, as they would undoubtedly have did quinine control the disease by these actions. Hence M. Sée evidently thinks that what, perhaps, no one action is capable of effecting, when they are combined the result is successful. No doubt the beneficial effects of quinine are due to its physiological action, but certainly not to any one or all of those enumerated above.

But although, as we have said, the known physiological actions of quinine do not apparently throw any light on the connection between its action and the beneficial results which follow its administration in ague, do we know all its actions ? Certainly not. If we do not know its action in intermittent fever, then how are we to discover it. As every one knows, there are certain actions of remedies, especially on nerve structures, which it is impossible directly to demonstrate, but an action of which indirectly very strong and even conclusive proof can be obtained by noting their effects ; although this is much more difficult when we have to examine these actions in disease, and of which in health there may be little or no evidence.

Thus Binz says: "We are ignorant of any direct relation between quinine and the nervous system which might be utilised for therapeutic purposes ; although we cannot deny that such may exist, any such influence exerted by quinine upon the nervous system is at present purely hypothetical and unsupported by a single experiment." This is, in fact, just what we might expect. You cannot prove by direct experiment what does not exist, viz., the action of quinine in ague on a healthy man or frog. The proof must be from the effects of its action in disease, *i.e.*, clinical experience ; and in this way it is possible to get, we believe, as conclusive evidence as by direct experiment.

That quinine is a nervine tonic even Binz allows is probable. That it is we think there is sufficient proof over and above its tonic action to the general nutrition by stimulating the digestive functions and retarding tissue metamorphosis. Because in certain nervous derangements it proves curative, we believe, in virtue of this action, as it can be by no other, long before it could have time to improve the general nutrition of the body ; as in periodic neuralgia, asthma, laryngismus stridulus, rigors, etc., etc. In these affections a full dose of quinine will often speedily arrest them if given an hour or even half an hour before the attack is expected, showing that the action must be a direct one, and that through the nervous system. Its beneficial influence in those diseases which we know are due to a disturbance of ennervation must be due, we believe, to an action on the nervous system. This is borne out by clinical experience, for quinine is beneficial in neuralgia just in proportion as the case is of purely nervous origin and occurring in those in whom there is want of tone.

Stillé thus explains its action in periodic neuralgia : "by regulating and moderating the disorder of the nervous system ;" and then explains its action in malarial fever : "by directly neutralizing a material poison, or causing elimination from the system." That it does not do the latter we have already seen, as no eliminative action occurs after the employment of quinine ; as to its being a chemical antidote clinical experience is against it ; then why not apply the explanation of its power in periodic neuralgia to its influence over malarial fever ? It is the most probable of the explanations, and the only one which clinical experience supports. In all these nervous diseases we have mentioned there is good reason to believe that not only is some part of the nervous system either primarily at fault or the point of attack, but also that in some the whole nervous system is in an atonic condition, or unstrung, as they occur most frequently in those of weak constitutions, whether this condition is hereditary or acquired In others the disease or symptoms are the result of a sudden shock which suddenly, and for a time only, reduces the nervous tension and brings it below par.

Take, for instance, the rigor which follows catheterization. This is undoubtedly due to an impression or shock to the nervous system, and which can be prevented or checked by a dose of quinine. The action of quinine on the nervous system is therefore here as evident and undoubted as that the rigor is the result of functional disturbance of the nervous system, the one mutually proving the other.

Quinine can therefore arrest other rigors and fever paroxysms than those which occur in intermittent fever, and that without there being any suspicion of the presence of a poison in the blood, so that its power of arresting certain fever paroxysms is quite independent of an action on a morbid element in the blood. But no doubt poisons in the blood, by acting directly on the nervous system, can disturb it even more readily and directly than the presence of a foreign body in the urethra. Still there is no reason to prevent quinine acting in the one case as in the other, only in the case of a poison in the blood, like the malarial, the quinine must be repeated if these shocks or periodical attacks are to be prevented until the poison has exhausted itself. The greater power of quinine in malarial fever than in other fevers can readily be accounted for, not only by the blood poison being of a different nature, but also by the different seat of selection of these poisons; just as the typhoid poison has a special affinity for the intestinal glands and small pox for the skin and mucous membrane, so the malarial fevers attack chiefly the nervous system, at least in the first instance. Whenever in disease, however, the symptoms approach the type of malarial fever, with a cold, then a hot stage, followed by an intermission, then quinine is beneficial; that is to say, when that portion of the nervous system is involved which is always implicated in malarial poisoning. So that we have proof that quinine exerts the same action in other diseases than those of a malarial origin, which is against the chemical action of the drug, and from the nature of the cases in which it proves useful is strongly corroborative of a tonic action on the certain parts of the nervous system, and therefore of it being antagonistic to the action of the malarial poison, *i.e.*, a physiological antidote.

In health this action of quinine is however not very manifest, but the symptoms of cinchonism, headache, buzzing in the ears, confusion of sight, etc., point undoubtedly to an action on the brain, and that not only does it act on the brain, we may readily infer just as alcohol acts as a stimulant and sedative to other parts of the nervous system in addition to the brain. The cerebral effects are however the most prominent, as they are most clearly and quickly evident from its delicate functions being so readily disturbed, and although the beneficial action of quinine is not usually apparent until some time after the symptoms of cinchonism have disappeared, that is until it has prevented or diminished the next paroxysm of the disease, it does not by any means follow as some have argued that therefore the curative power of quinine cannot be due to a stimulating or sedative action, because those sensible effects have ceased, unless it were held, which it is not, that the malarial poison acted principally on the brain, or that with the disappearance of these most prominent effects, all the other actions of the drug ceased. It simply shows that certain of its cerebral effects have diminished, just as with alcohol which first excites, then acts as a sedative. When the excitant effects pass off or are merged into other symptoms, we cannot say that therefore alcohol has ceased to act, and even when all cerebral symptoms disappear its stimulant action lingers in other parts until it is entirely eliminated from the system. It is even possible to understand that the beneficial result of the stimulant action may be shown after elimination of the stimulant. For instance, if by a dose of quinine the next attack of fever which would naturally occur twenty-four or forty-eight hours afterwards is prevented, it does not follow that quinine waits on the paroxysm and then attack it. Its beneficial action commences as soon as it is absorbed and by its action on the nervous system the paroxysm is prevented, not by an action twenty-four hours after its elemination, but by its immediate action preventing that disturbance, which in time develops into a fever paroxysm. So that we must not always take for granted that the more obvious effects of nervous actions are the only ones produced by remedies, as an action that in health may not be manifest, may in cases of functional derangements be actively remedial. This is the reason why certain curative actions of remedies are only witnessed in disease. Nor is this action peculiar to quinine. Compare for instance the effect of arsenic in St. Vitus's dance with what are ordinarily known as its physiological actions; and in regard to it the same may be said as is said by some of quinine and its action in malarial disease, viz., that its effect in chorea cannot be explained by its known or evident physiological action, yet no one can doubt that arsenic acts in chorea purely as a nervine tonic.

Another link in this chain of reasoning is that other nervous stimulants, as arsenic, caffein, alcohol, gentian, piperine, capsicum, beberia, strychnia, etc., although differing considerably both in kind and degree of action, have some power over intermittent fever and other diseases of a nervous pathology. In fact as adjuvants and occasionally as substitutes they are invaluable, as clinical experience has abundantly shown.

In virtue, however, of certain peculiar properties one is more useful than another in different nervous diseases, due partly to their somewhat different actions, the part of the nervous system affected and the cause of the disturbance. Thus quinine appears to exert an influence on that part of the nervous system for which the malarial poison has a special affinity, and in virtue of this is more curative than the other remedies, just as arsenic has a special tonic influence on the motor nerves, in virtue of which it is more powerful in St. Vitus's dance. Thus arsenic does not act in chorea, or St. Vitus's dance, as a tonic to nutrition is shown by the fact that other tonics to nutrition do not cure the disease; and caffein acts on the pulmonary nerves, which renders it more useful in asthma. Hence we believe quinine to act in malarial diseases as a stimulant or sedative to the nervous system, especially to that part most implicated in these diseases; and that it is principally in virtue of this action that it proves curative by rendering the malarial poison inoperative by an antagonistic action on the nervous system, and that it proves beneficial in proportion as the nervous disturbance is predominant and to the absence of complications. Although we arrive at this conclusion by argument and not direct experience, the evidence in its favour appears to us so strong as to give it the place of a more than probable theory and to be a much more reasonable explanation of its action than any other as yet brought forward; and that by this method of reasoning it is possible to arrive at correct conclusions in absence of direct experiment the literature of therapeutics amply shows.

Messrs. Stephenson, Mackay and Baildon made a few remarks on some of the points touched on by Dr. Moinet, and on the motion of Mr. Stephenson, seconded by Mr. Baildon, a hearty vote of thanks was awarded to the doctor for his interesting communication.

The attention of the meeting was then called to a very interesting collection of specimens presented to the museum by Mr. Robert Jamie, of Singapore. The presentation was made through Mr. H. C. Baildon, who gave a short account of each specimen on the table. Mr. Stephenson proposed a special vote of thanks to Mr. Jamie for the valuable addition to the museum, which was very cordially responded to. The specimens are, Borneo camphor as obtained from the tree; Borneo camphor prepared for the market; a very fine specimen of the edible bird's-nest; resin obtained from the mangosteen tree; salep; fruit and seed of *Uvaria rosea*; bark, root, fruit, and oil of sangsarit; fingered orange; camel bezoar stone; tiger's fat; fine specimen of Japanese oil of peppermint; fruit of *Trapa bicornis*.

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The fifth meeting of the session of this society was held in the Manager's Library of Anderson's College, 204, George Street, on the 13th inst., at 9 p.m. Mr. Daniel Frazer, President, in the chair. The Secretary being absent through indisposition, Mr. J. M. Fairlie, Vice-President, acted *pro tem.*, and read the minutes of the last meeting, which, being approved, Mr. W. L. Howie, F.C.S. (Edinburgh), was called upon by the Chairman to deliver his lecture on the telephone. Mr. Howie entered into a history of the origin and progress of telephonic discoveries, described the principle adopted by Professor Graham Bell in his invention, with much clearness, and afterwards referred to the more recent discovery, the phonograph; and concluded a most interesting lecture with practical illustrations both of the speaking and singing telephone. The lecture was listened to with great attention, and evidently much appreciated, while the experiments were most interesting and sometimes highly amusing.

After a few remarks by Messrs. Frazer, Fairlie, Kinninmont, Paul and others, the meeting was brought to a close by a hearty vote of thanks being awarded Mr. Howie.

LEEDS CHEMISTS' ASSOCIATION.

The fifth general meeting of this Association for the present session was held on Wednesday evening, February 13th.

The chair was occupied by the President, Mr. Jefferson, and after the minutes of the previous meeting had been read and confirmed, a lecture on "The History of a Loaf of Bread" was delivered by Mr. E. O. Brown.

The lecturer having explained that his lecture was originally intended for a mixed audience, and, therefore, partook more of a popular than of a scientific character, proceeded to trace the early history of bread, stating that the first mention of it is in the third chapter of the Book of Genesis, and it was then most likely made from maize. Bread was generally understood to be baked dough, and as such he should treat it; but it was formerly simply boiled. Many kinds of corn were used in its preparation, indeed, down to the last century, hardly any wheat was used in the North of England, but, no doubt, wheat was the grain from which bread might now be considered to be prepared. The largest quantity was grown in America, and heavy soils suited it the best. Having stated that the wheat plant belonged to the order Graminaceæ, and was monocotyledonous, the lecturer described its mode of growth, and the composition, organic and mineral, of a grain of wheat; and then proceeded to treat of wheat ash, which, although only 1·7 per cent., yet contained many chemical substances, aluminum being occasionally one of them; hence one liability to err in testing bread for adulteration with alum. The amount of carbon contained in the wheat plant was over one-third of its total weight, so that if the gross product of an acre of ground were 4800 lbs., that would be equivalent to 1734 lbs. of carbon per acre taken from the ground or some other source for each crop. Different theories as to whence this large quantity of carbon was obtained had been advanced, but when the fact was considered that the atmosphere contained over ten times as much as that required, there could be no doubt of its affording the chief supply. The process of cultivating the wheat plant, and of grinding the grain into flour, were then described, and the custom of rejecting the bran, which contained the most nutritious elements, censured. The average composition of bread was stated to be 44 per cent. of moisture, about 2 per cent. of ash, and the remainder combustible matter. The amount of gas given off by the dry distillation of bread crumbs, and its effect in rendering lime water turbid, were shown by actual experiment; and the fermentation, aeration, and the process of baking bread described.

A cordial vote of thanks was awarded the lecturer on the motion of Mr. Highmore, seconded by Mr. Hellowell.

ABERDEEN SOCIETY OF CHEMISTS AND DRUGGISTS.

The second annual conversazione of this Society was held in the Music Hall Buildings, on the evening of Tuesday, 12th of February. The attendance was close on 300, the "Square Room," where the conversazione was held, being quite packed.

Mr. M. Sinclair, senior, wholesale druggist, occupied the chair, and opened the proceedings at 8.30 p.m., with a short and humorous speech. He contrasted the present state of trade in Aberdeen with what it was fifty years ago, mentioning that at that time the ordinary shop hours were from 7 a.m. to 10 p.m., on six days of the week, and not much less on the seventh. The first work in the morning was to light the fire, sweep the shop, clean the oil glasses (there being no gas in those days), and take water from the public well. At that time the Broadgate was the principal place of business, there being five drug shops betwixt the top of Queen Street and the bottom of the Gallowgate, the distance not being over 200 yards. The Chairman then proceeded to make some humorous allusions to the different kinds and price of castor oil then in use; and went on to speak of the vast progress that had in recent years been made in the science of chemistry. He concluded by giving the young pharmacists present an advice to devote their attention to chemistry, in which there was yet a large field open for them to work.

An interesting musical programme was then gone through, the solos and duets being given by the members of the trade and their friends. A hearty vote of thanks was on the motion of Mr. J. Mackenzie, Edinburgh, awarded to the ladies and gentlemen who had contributed to the evening's entertainment. A vote of thanks to the chairman finished the conversazione; after which the company adjourned to the ball room, where they engaged in dancing for the rest of the evening. Supper was served during the evening. There was a telephone set up betwixt the round and west front rooms; but owing to the noise, it could not be taken advantage of.

The third of the course of lectures under the auspices of the above Society was delivered in the Room, St. Nicholas Lane, on Thursday, February 14, at 9 p.m.

Mr. David Ritchie, V.P. of the Society (in the unavoidable absence of the President), occupied the chair, and in a few remarks introduced the lecturer, Mr. George Edward, who, amidst great applause and insuppressible laughter, delivered a lecture on "Daftness." The lecture assumed the character of sketches of various characters who had come under the lecturer's personal observation. All of them seemed to have enjoyed distinguished notoriety in the circle of his acquaintance, and every character sketched manifestly had a *big want*, yet every one of them seemed to leave a record behind worthy of consideration. Such a night's genuine mirth and laughter is rarely to be met with even at the shrine of caterers for public amusement.

Votes of thanks to the lecturer and chairman brought the evening's proceedings to a close.

MEETING OF CHEMISTS AND DRUGGISTS AT ABERDEEN.

A district meeting of the Chemists and Druggists' Association was held in Aberdeen, on the 12th February, at which was present a deputation from the Scotch committee, consisting of Messrs. Mackenzie, Edinburgh (V.P. of the Scotch committee), Kerr and Russel (Dundee), as well as a fair proportion of the town and country members belonging to the Aberdeen division.

Mr. James Paterson, of Messrs. W. Paterson and Sons, presided, and introduced Mr. Mackenzie, who (in the unavoidable absence of the Hon. Sec., Mr. J. M. Fairlie) described the origin and progress of the Association.

Mr. Burnett, Fraserburgh, then moved:—"That this meeting of pharmaceutical chemists, and chemists and druggists, representing the trade in the North of Scotland, rejoices in the formation of the Trade Association, heartily approves of its objects, and commends it to the liberal support of the trade generally," which was seconded by Mr. John Gordon (of Messrs. J. and J. Urquhart), Aberdeen; and supported by Mr. Russel, Dundee.

Mr. D. Ritchie (V.P. of the Aberdeen Society of Chemists and Druggists), then moved:—"That this meeting approves generally of the past action of the Executive, for the spirited manner in which they have defended the unjust attacks of the Medical Defence

Association, and those uncalled for proceedings under the Adulteration Act," which was seconded by Mr. J. Sutherland (Aberdeen); and supported by Mr. Charles Kerr (Dundee).

Mr. G. P. Cruickshank (President of the Aberdeen Society of Chemists and Druggists), then moved :—That while deprecating to the fullest extent indiscriminate prescribing of druggists, this meeting maintains that it is the privilege and duty of the pharmacist to give advice over his counter for simple ailments, and in cases of extreme emergency," which was seconded by Mr. W. O. Ogilvie (Arboath). All of which were passed, *nem. con.*

A hearty vote of thanks to the deputation and the chairman brought the proceedings to a close, which lasted upwards of an hour and a half.

Proceedings of Scientific Societies.

PHILADELPHIA COLLEGE OF PHARMACY.

At the fourth pharmaceutical meeting of the present session, held on January 15th, Professor Maisch called the attention of the meeting to the black root of Georgia (*Pterocaulon pycnostachyum*, Ell.), James' tea (*Ledum latifolium*, Lin.), the rheumatism root of Virginia (*Dioscorea villosa*, Lin.), the black haw of Florida (*Viburnum obovatum*, Walt.), specimens of which plants and drugs were exhibited to illustrate two papers read by him, entitled "Notes on a Few American Drugs" and "The Useful Species of Viburnum."

Mr. E. M. Boring exhibited a plant used by an empiric in the cure of cancer; it was recognized by Professor Maisch as *Ceanothus Americanus*, Lin., and is called American tea, New Jersey tea, or red root, because that is the colour of the root. It was made use of largely during the American Revolution in place of the true tea. Some time during the years 1863 or 1864 an enterprising individual, who had become familiar with the manner of preparing and drying tea in China, commenced the trade of packing the leaves of this plant in a similar manner, at the same time circulating through the newspapers that the *tea* plant grew largely in certain sections of the United States; for a time the trader prospered, but the article soon fell into disuse.

Chloral Hydrate.

The subject of the *impurities in chloral hydrate* was discussed.

Mr. Boring said that his attention had been directed to the subject by a paper of Professor Liebreich, which stated that only such chloral should be used as was in crystals and perfectly dry. He said that all the crystal chloral in the United States market adhered to the side of the bottle. One sample gave no evidence of uncombined chlorine, while in another the evidence was decided; both samples reddened moistened litmus paper suspended in the bottles. He had no trouble with it practically, and had had no complaints, but wanted to be sure that he was dispensing an article that came up to the standard of the authorities on the subject. If they give a false standard, from improper motives, they should be exposed.

Prof. Maisch remarked that of late years he had not had much practical experience with chloral; but from earlier experiments he was convinced that the shape of the crystals was no criterion of its purity, that pure chloral hydrate had a slight acid reaction, and that the density of the white vapours produced with a glass rod moistened with ammonia was largely influenced by the temperature. The practice of giving a little information about physical properties for the purpose of influencing trade was carried on in Europe as well as in the United States; he did not believe that absolutely pure chloral hydrate had as yet been put into the market, and he was strengthened in this belief by the transactions of the Berlin Apothecaries' Society, where this question was incidently ventilated. Of late chloral chloroform, that is, chloroform made by the decomposition of chloral, had been bruited in Germany as the only article worthy of confidence for its purity, but the researches instituted by Schacht and Bilz upon this claimed superiority of chloral chloroform had shown it to be entirely erroneous, as the chloral chloroform when treated with sulphuric acid became discoloured very speedily, like the chloral from which it had been prepared, which was not the case with absolutely pure chloral, or with the chloroformum purificatum of the Pharmacopœia.

Dr. A. W. Miller exhibited some authentic herbarium specimens of plants gathered by Dr. J. F. Rothrock, Professor of Botany in the University of Pennsylvania, during an extended tour through the Western portion of our country. True damiana, that from which the original description of *Turnera aphrodiciaca* was taken, and two specimens of Aplopappus, yielding also so-called damiana, were shown. Three specimens of Eriodictyon were shown, all of them indiscriminately called Yerba santa.

Prof. Maisch stated that the specimens heretofore described as *E. Californicum* had the leaves somewhat different from those shown and a characteristic appearance of being varnished upon the upper surface.

Prof. Maisch stated that he had been examining different samples sold as *Grindelia robusta*, and concluded that probably three species are sold as such, and that much of it is *G. squarrosa;* he hoped that he would soon be able to report more fully upon the matter.

Prof. Maisch presented specimens of *Florida oranges*, having upon their rind what is called "rust," of a greenish brown appearance, and occasioned, as it seems, by a fungoid growth; it is reported that the same tree, in different years, will produce fruit sometimes thus affected and at others free from this defect. It was stated that already in the extreme Southern States the juice of the sour orange has been utilized as a source of citric acid, and oil of petit grain, superior to almost any ever offered in the American market, has been brought into commerce from this source. There would seem to be no good reason why the volatile oils of lemon, orange and neroli, and orange-flower water of excellent quality should not be produced there also.

The preparation of bay rum was discussed. The following formula was said to produce an excellent article: Four pints of alcohol, three pints of water, one pint of Jamaica rum, one drachm of oil of bay and twenty drops of oil of pimento; a few drops of aqua ammoniæ gives the requisite colour to a whole gallon.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday, February 14, when a paper was read by Mr. Mason on "Cyanogen." After reference to the origin of the name cyanogen, and the researches of Gay Lussac upon prussic acid, the hypotheses of its constitution were considered, the conditions under which it is formed, and the manufacture of chemical compounds containing cyanogen, such as cyanide and ferrocyanide of potassium. The decomposition to which the acid of the Pharmacopœia is subject, and the preservative agents used, were next noticed. The estimation of hydrocyanic acid was then discussed, the process of the Pharmacopœia, if strictly followed, was shown to be incorrect by the experiments of Mr. Siebold, made in 1874. The gravimetric method was next given, followed by the most delicate and characteristic tests for cyanogen as cyanide, and the use of hydrocyanic acid in testing for picric acid in beer. The toxicology of the subject was fully treated, the methods of detecting hydrocyanic acid in organic mixtures; the length of time after which it could be detected, were discussed, and the author concluded by showing the value of ferrocyanide and ferridcyanide of potassium as a test for several metallic bases.

The paper was followed by an animated discussion, and a "Note on a Test for Bismuth," which will be printed in a future number, was then read by Mr. Savory. After the discussion on this paper the meeting was adjourned till February 28.

Parliamentary and Law Proceedings.

Poisoning by Morphia.

On Monday, Mr. Humphreys held an inquest at Hackney, on the body of Lionel Thomson, aged 27 years, a chemist, whose body was discovered by some workmen in a house in the course of erection in Graham Road, Dalston. The deceased had entered the buildings at night and made himself a resting place on a sack of lime and had a bundle of laths for his pillow. On being searched, several letters were found in his pockets in reply to applications made for employment, and also two bottles containing chloroform and morphia. The body was was removed to the mortuary. It was stated that the deceased had been in the habit of taking opium for some time past. The jury returned a verdict to the effect that the deceased died from an overdose of morphia, but whether taken accidentally or for the purpose of destroying life there was no evidence to prove.

Poisoning by Chloral.

On Tuesday, Dr. Hardwicke held an inquiry at the Argyll Hotel, King's Cross, as to the death of Mary Tyler, 58, wife of Mr. William Tyler, of Argyll Square. Mrs. Tyler had suffered for many years from spinal complaint and paralysis. She took chloral night and day. Mr. Tyler administered it, and there were always two bottles by the bedside, one containing syrup of chloral and the other a solution of one part of the syrup and five parts of water. Both bottles were identical in size and shape, and neither had a label. He gave his wife a dose of the solution on Friday evening, and at midnight she awoke in pain and asked for a strong dose. He gave her the dose, but, the lamp being out, he believed he gave a dose out of the wrong bottle. In the morning he found that his wife was dead. Dr. Dingley said that the cause of death was a fainting of the heart, caused by an overdose of syrup of chloral. An ordinary dose of chloral was from 10 to 20 grains, but Mrs. Tyler had probably taken 80 grains. Mr Tyler was censured for administering chloral year after year without medical sanction, for having two bottles alike in size and without labels, and for carelessness in giving the chloral. A verdict of "Death from misadventure" was returned.—*Times*.

Poisoning by a Narcotic.

An inquest has been held at Harbertonford, near Totnes, by Mr. Henry Michelmore, county coroner, respecting the death of Ann Eden, the wife of a dairyman. It was stated that the woman had been slightly unwell for about a week, and on Thursday she was seen by Mr. Hains, surgeon, of Totnes, who found her suffering from a cold and bilious attack. She complained of not being able to sleep. He prescribed for her, and told her that when she had taken the medicine she would probably get sleep. On Sunday she felt better, and asked the nurse who was attending her to try and get her a smelling bottle, or something to cause her to sleep. Deceased's son was sent to Mr. Prestcott, the manager of the quarry where Eden works, to borrow a smelling bottle. Mr. Prestcott, however, had none, and sent her a draught. The deceased took it, and soon afterwards fell asleep. After some hours, as it was impossible to rouse her, Mr. Hains was sent for, and attended immediately. He informed the jury that he found her in a comatose state. He administered the usual remedies, but they were of no avail. He closely questioned the nurse, who ultimately admitted that deceased had taken a sleeping draught. From the colour of the fluid left in the bottle, and the smell, he concluded that it was a preparation of opium. He had since made a *post mortem* examination of the body. The lungs were congested, the left ventricle contained fluid blood with white clots, the right ventricle contained fluid blood and no clots. The heart was healthy. The liver contained a great quantity of bile pigment, but was otherwise healthy. The membranes of the brain were greatly congested, but the structure of the brain itself was healthy. The contents of the stomach smelt of laudanum.

In reply to the Coroner, witness said in the case of death by narcotic poisoning the vessels of the brain would be found congested.

The Coroner: Would the patient have lived had she not taken the sleeping draught?

Witness: Yes, certainly.

In reply to further questions, witness said the cause of death was directly due to the draught, which was either a preparation of laudanum or Battley's solution.

The Coroner and jury then adjourned to the residence of Mr. Prestcott to take his evidence, as he was suffering from a dislocated shoulder, and was unable to leave his bed.

Mr. Prestcott said the draught he sent was about half the quantity which he had been in the habit of taking himself to procure sleep, and which had been given to him by his medical man. He was ignorant of what it contained.

The Coroner, in summiug up, said he thought the evidence before them would enable the jury to arrive at the conclusion that death was due to misadventure.

The jury returned a verdict of homicide through misadventure.

The Coroner, addressing Mr. Prestcott, said he hoped it would be a warning to him for the future.

Mr. Prestcott replied that it certainly would be.—*Western Weekly News*.

Dispensing Memoranda.

[54]. Creasote Pills.—If "Pil. Creasoti"* would read carefully he would find that I had† "made creasote pills both with light magnesia and with slaked lime, but in either case the creasote is almost entirely combined, and pills made with either excipient are as insoluble as marbles; I have boiled them for some time with water without altering their shape." These are facts, and I have since repeated them in regard to magnesia, but they have reference to pills made of creasote and light magnesia or slaked lime only, *i.e.*, without any compound rhubarb pill in combination. Not that the addition of this would make much difference, as each particle of the powder which Mr. Wilkinson‡ recommends (made by mixing two minims of creasote with one grain of light magnesia) would be almost as inert as a pill made of the same, notwithstanding its being mixed with compound rhubarb pill.

Professor Redwood§ lays down three fundamental rules in the choice of excipients for pills. They must "not be incompatible with any of the ingredients of the pills;" must "modify as little as possible their action either by causing them to become hard or in any other way;" and must "not unnecessarily or inconveniently increase their size."

The use of light magnesia with creasote is inconsistent with the first and second of these; it is incompatible

* *Pharm. Journ.*, Feb. 16, 1878, p. 662.
† *Pharm. Journ.*, Feb. 2, 1878, p. 619.
‡ *Pharm. Journ.*, Jan 19, 1878, p. 579.
§ 'Practical Pharmacy,' p. 350.

with creasote as it makes an inert compound with it and the pills become hard and insoluble.

Hyperbolically, as well might a pharmacist, when a physician orders diluted sulphuric acid for diarrhœa, add light magnesia to neutralize it, because the patient complained that the acid acted on his teeth. There is quite as great a difference between the action of creasote and creasote and its combination with magnesia as there is between diluted sulphuric acid and Epsom salt, and if "Pil. Creasoti" will try a pill made of creasote and light magnesia—say equal parts of each, which make a good pill—I think he will find that nature's vitalized chemical process of digestion has no action upon it. "Pil. Creasoti" has, in fact, emasculated himself; he may be a pill, but not of creasote.

I wrote hurriedly when I sent my last memorandum. Tabulated, this will represent my formula for creasote pills more accurately:—

℞ Creasote . . . . fl. ʒij.
Powdered Animal Soap . . grs. 120.

Put the creasote in a one-ounce wide-mouthed stoppered bottle, add the soap, and mix well. Then digest in a water-bath till they combine. Each two grains of the mass will contain, as nearly as possible, one minim of creasote.

It is not a new subject to me. I have tried many experiments, at different times, how best to administer creasote. At last finding that powdered soap was soluble in creasote when the two are heated together, I conceived the idea that in suitable proportions they would make a good pill. I used the powdered animal soap, as it contains the least free alkali, and this alkali in the drying and powdering will no longer be in the caustic state. Caustic alkalies decompose creasote. To enable the soap to be powdered also it must previously have been freed from most of its water, and, lastly, being principally a stearin soap, it gives more solidity to the pill mass than an olive oil soap would.

WM. MARTINDALE.

10, *New Cavendish Street.*

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[59]. "PANDRODYNE" (?).—Mr. J. W. Barnes, under "Dispensing Memoranda," wishes to be furnished with the composition of "*Pandrodyne*" (?). I am sorry I cannot help him in regard to its real nature, because it strikes me the prescription is one of that class designed to puzzle, or which can only be guessed at, or compounded, according to the writer's views, at some one particular house with which there is an understanding—alike undignified and manifestly unfair—not only on the part of the physician but the apothecary or chemist who enters into such an arrangement. I know there are many such—not only in London, but elsewhere. Honest pharmaceutical chemists have no chance of pursuing their trade under such ignoble circumstances without a few heartburnings, and I am sorry the greatest offenders are to be found among the ranks of my own profession. It is akin to disgrace, to say nothing of the unfairness towards an honourable body, for a physician or surgeon to request his patients to go to any particular house. There could be no harm in recommending two or three respectable men; but it is different when the prescription is handed to the patient, with an express order, that Mr. So and So alone understands how to "fill it up." That this is done, day after day, cannot be gainsaid. The quantity of the "pandrodyne" is very small, as the mixture ordered is five ounces, and one drachm for a dose gives three drops at each taking. I have thought over many things in order to find out what "pandrodyne" possibly could mean, and I am inclined to think it is either chlorodyne, or that remedy so much extolled in Australia and some parts of America, called "painkiller."

The derivation of the word also is evidently from the Greek, *pas*, *pasa*, *pan*, and *odune*, which would give it the appellation of a reliever or curer of "all pain"; or its origin may be traced to *pandoura*, a musical instrument of three strings, just as we get the name carminative from *carmen*, a song or charm. But it matters not from what fanciful source it is derived, the physician ordering such medicaments as can only be known to some one in coalition with him should be discouraged in every possible form and manner, for he is no better than any dishonest quack.

Northallerton. HY. BROWN, L.R.C.P., etc.

P.S.—Will you permit me to suggest to many of your correspondents and inquirers that far more attention would be paid to their communications if they gave their names and addresses. If a communication is worth reading, we should know the writer at least by name.

H. B.

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[61]. UNG. HYDRARG. NIT., B. P.—In answer to "Inquirer" let me say it is not necessary to heat the mecuric solution until all the fumes are given off, because there is no use in applying heat immediately the action of solution commences.

There is nothing to be gained by too hasty solution, and the mercury and acid should at first be placed in a warm place, say at the side of a fire, so as to allow the fumes to escape up the chimney, and when all the mercury is dissolved the temperature of the solution, if necessary, must be raised to 180° or 190° F.

The object of having nitric acid in excess, is to prevent the formation of suboxide of mercury, which is subsequently converted into metallic mercury. The whole subject is well worth close study; and I would recommend "Inquirer" to carefully peruse the article in Christison's 'Dispensatory,' as giving by far the best account with which I am acquainted, Pereira not excepted. As it may not be close to the hand of "Inquirer," I may state that the probable composition of citrine ointment is that of a mixture of nitrate of binoxide of mercury with oleic and stearic acids, and the fatty acid called elaidic. Nitric acid attacks oleic acid with great violence, and a whole series of volatile acids are formed, and any work on chemistry will supply "Inquirer" with all desirable information on this point. It is the nitrous acid which converts oleic into oleidic acid, which is an allotropic form of oleic acid. The Dublin formula was prepared without the aid of heat in dissolving the mercury, and is supposed to have also contained some nitrate of the protoxide of mercury.

I have prepared the ointment upon many occasions, and found the best temperature for combining the mercuric solution with the oily matters to be 180° or 185° F. I had seldom any difficulty; but from first to last the undivided attention of the pharmacist should be devoted to the subject in hand, and the ointment should be stirred with a bone, or ivory, or glass stirring rod until almost cold, and only one way. It should be of the consistence of freshly made butter.

Northallerton. HENRY BROWN.

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[63]. Can you give me an idea as to the mixing of the following prescription, in order that when dispensed it shall not present a turbid appearance?

℞. Tinct. Ferri Perchlor. . . . . . ʒj.
Liq. Arsenicalis . . . . ʒiss.
Acid. Hydrochlor. Dil. . . . . . ʒss.
Sp. Chloroform. . . . . ʒj.
Syr. Ferri Phosph. . . . . . . ʒj.

The party who brought it said that it was dispensed before, and that it was sent out quite clear without sediment.

I found the above mixture turned black as ink in dispensing.

APOTHECARY.

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[64]. BLUE PILL.—Where "Blue Pill" is prescribed with soft extracts, should I be justified in using

hydrarg. c. cretâ instead of pilula hydrarg., seeing that they are chemically alike, and identical in strength?

Leicester.

ALFRED CHAPMAN.

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[64]. The symbol (℥) controversy has been settled and uniformity I hope will be the result.

May I suggest the discussion and settlement of another dispensing matter? I allude to the value of the term gutta.

The following prescription, received a few days ago, will place the question before your readers—

℞. Aq. Laurocerasi . . . . ʒij
Vini Ipecac. . . . . ʒj
Chlorodyne . . . . ʒij
Acid. Hydrocyanic. Dil. . . . . gtt. xx
Aq. ad. . . . . ℥viij
Ft. Mist. Capt. cochl. ampl. j urgente tussi.

In the above are drops or minims of the prussic acid to be dispensed?

Certain published statements say that 20 drops of this acid are equal to about 27 minims.

It would also be desirable to know what chlorodyne is to be used. The author of 'The Companion to the B.P.' gives a formula—Liq. chloroformi comp. (page 93, ninth edition), which has been represented to him as the composition of the popular medicine called chlorodyne. Might this be used?

UNIFORMITY.

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[65]. Is there any valid objection to the use of Tartaric Acid in the manufacture of Quinine Pills and of Carbonate of Potash in the manufacture of Aloetic Physic Balls for Horses?

S.

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[66]. A mixture dispensed from the following prescription was brought from the patient's house, by the medical man who wrote it, stating that the separation which had taken place was not necessary to the combination, but due to some error in its preparation. Will you be good enough to place it in the dispensing memoranda?

℞ Quinæ Sulph. . . . . gr. iv.
Ac. Nit. Mur. dil. . . . . . . ʒij.
Tr. Nuc. Vom. . . . . ʒij.
Sp. Æth. Chlor. . . . . ʒj.
Syr. Limon. . . . . ʒiv.
Aquæ . . . . ad ℥viij.
M. ℥j. ter die.

E. A. T.

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[67]. I should like to hear the opinions of some of your readers as to the best mode of procedure to adopt in dispensing the following prescription which I had handed to me a few days ago, and what should be the appearance of the product:—

℞ Tr. Quiniæ Ammon. . . . . . ℥j.
Potass. Iodid. . . . . gr. xvi.
Syrup. Aurant. . . . . ʒij.
Aq. Piment. . . . . ℥iv.
Aquæ . . . . ad ℥viij.
M. Sumat coch. ij mag. ter die.

MISCH MASCH.

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[68]. Could any reader inform me what is the best method of making the following:—

℞ Ferri Iodid. . . . . gr. iij.
Excip. q.s.
M. ft. Pil. j. Mitte xij.

A. H.

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[69]. Would any reader of the Journal oblige by information as to the mode of dispensing the following prescription?—

Pot. Iodid. . . . . gr. 80.
Mucilage . . . . ℥ss.
Sp. Æther. Nit. . . . . ℥ss.
Aq. . . . . ad ℥ij.

A JUNIOR DISPENSER.

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[70]. Having recently to dispense the following prescription and noticing, after it had been allowed to stand a few minutes, a peculiar separation, I would ask the cause, and if it could be dispensed so that no separation would take place.

℞ Pot. Bromid. . . . . ʒiij.
Tinct. Quiniæ . . . . ℥iss.
Tinct. Hyoscy. . . . . ʒiij.
Tinct. Lupuli . . . . ℥ss.
Aq. . . . . ad ℥vj.
M. ft. Mist.

Cambridge.

G. S.

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[71]. What is the proper mode of preparing the following ointment:—

Hyd. Ammon. Chlor. . . . . gr. xxv.
Ung. Cetacei . . . . ʒvij.
Glycerinum . . . . ʒj.
Ft. Ung.

I have been told that the slab should be heated; but I should mix them in a cold mortar; first well pulverize the Hyd. Ammon. Chlor. and gradually add the ointment, and I do not see that that method should not yield a very good ointment.

IGNORAMUS.

Notes and Queries.

[576]. BRAHEE SUGAR POWDERS.—Will any reader kindly give me the formula of the article sold under the name of Brahee Sugar Powders?

STUDENT.

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[577]. A WATER QUERY.—A customer of mine thinking of changing a leaden pump for fear of its contaminating the water, has been recommended to replace it by a cast iron one with a copper sheath, he wishes to know, however, before doing so, whether the constant exposure, first to water and then to the atmosphere would not render it equally as unfit for drinking. If you or any of your readers have any experience of this kind, I would be glad of information.

L.

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[578]. WRITING INK.—I shall feel very much obliged if some disinterested friend will give me a form for "Blue Black," or "Green Black Ink."

MAJOR.

Obituary.

Notice has been received of the deaths of the following:—

Mr. Stephen Carr Sagar, Chemist and Druggist, Swinton, in Lancashire, died April 6, 1877, and was born in Craven, Yorkshire.

In the early part of this century Mr. Sagar served his apprenticeship in Preston, and about 1835 opened a business in Heywood, from which he retired in 1852 with a competency—choosing for his place of residence the Isle of Man.

Certain failures in his investments made it judicious for him to recommence business at Swinton, where he successfully opened and conducted a respectable business up to the time of his death. He was a good naturalist with great pharmaceutical knowledge, and was remarkable for his conscientious accuracy and careful research into everything occupying his attention. He died respected by all, and his loss is much felt in the neighbourhood.

On the 9th of January, 1878, Mr. John Fergusson, Pharmaceutical Chemist, Strand Street, Liverpool. Aged 63 years. Mr. Fergusson had been a Member of the Pharmaceutical Society since 1842.

On the 20th of January, 1878, Mr. Richard Lewis Jones, Chemist and Druggist, Newport, Mon. Aged 38 years.

On the 21st of January, 1878, Mr. William Mitchell, Chemist and Druggist, Newcastle Street, Strand. Aged 60 years.

On the 22nd of January, 1878, Mr. Joseph Nixon Chemist and Druggist, Bowdon, Cheshire. Aged 31 years. Mr. Nixon had been an Associate of the Society since 1869.

On the 23rd of January, 1878, Mr. Joseph Procter, Pharmaceutical Chemist, Taunton. Aged 54 years. Mr. Proctor had been a Member of the Pharmaceutical Society since 1853.

On the 2nd of February, 1878, Mr. John Wellspring, Chemist and Druggist, Chandos Street, Strand. Aged 74 years. Mr. Wellspring had been a Member of the Pharmaceutical Society since 1869.

On the 1st of February, 1878, Mr. James Ainsworth Marshall, Pharmaceutical Chemist, Waltham Abbey. Aged 66 years. Mr. Marshall had been a Member of the Pharmaceutical Society since 1842.

On the 5th of February, 1878, Mr. Samuel Cormell Price, Chemist and Druggist, West Bromwich. Aged 74 years.

On the 9th of February, 1878, Mr. John Robert Dalton, Chemist and Druggist, Stamford, Lincolnshire. Aged 38 years.

On the 9th of February, 1878, Mr. John Embley, Chemist and Druggist, Brierfield, Lancashire. Aged 33 years. Mr. Embley had been an Associate of the Pharmaceutical Society since 1873.

On the 10th of February, 1878, Mr. George Haldane, Chemist and Druggist, Wakefield. Aged 52 years.

On the 14th of February, 1878, Mr. James Sim, Pharmaceutical Chemist, King Street, Aberdeen. Aged 75 years. The deceased gentleman was a member of the Town Council and a Magistrate of the city upwards of twenty years ago, he was also a Justice of the Peace. Mr. Sim commenced business early in life as a druggist, and by his own personal exertions succeeded in establishing an extensive wholesale connection throughout the North of Scotland, where he gained the personal regard of a large range of acquaintances, who valued him alike for his integrity of character and geniality of disposition. Mr. Sim became a Member of the Pharmaceutical Society in 1853.

On the 15th of February, 1878, Mr. William Henry Ryde, Chemist and Druggist, Penge. Aged 37 years.

On the 17th of February, 1878, Mr. Robert Spear, Pharmaceutical Chemist, Cheetham, Manchester. Aged 32 years. Mr. Spear had been a Member of the Pharmaceutical Society since 1870.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Preliminary Examination.

Sir,—At the last meeting of the Council, in the conversation respecting the recent Preliminary examination, one or two speakers expressed opinions that the elder boys in most national schools would be able to pass that examination, at least the English and arithmetic of it.

Acting upon that idea, I have placed the questions before the first class in one of the national schools here, and in half an hour about 75 per cent. of them were able to answer sufficient of the arithmetic to have passed, and in three quarters of an hour, more than enough of the English. The master assured me that had the boys had a full hour to each subject, several of the remaining 25 per cent. could also have passed.

J. Stainer.

Folkestone, February 20, 1878.

The Dental Practitioners' Bill.

Sir,—My object in writing to you just now is to take the opportunity of saying how heartily I indorse the remarks of your correspondents in last week's Journal, relative to the Dental Practitioners' Bill now before Parliament.

It would be manifestly a "flagrant injustice" to those registered chemists and druggists who have been practising surgical dentistry for a good many years, and in whom the public have the greatest confidence, to have this privilege taken from them at a moment's notice. I certainly think the Parliamentary Committee of the Society would be doing good service if it were to make an effort to secure the exemption from any penalty under the proposed Bill, of the many chemists and druggists throughout the country who now "extract teeth." Trusting that by united and vigorous action our undoubted rights may be preserved.

W. T. Martin.

Cliffe, Lewes.

Sir,—Allow me to thank you for the interest you have taken in calling the attention of that portion of the trade who are practising dentistry, to Sir John Lubbock's Bill; had it not been for you it might have passed unnoticed.

I fully agree with Mr. Long of Croydon, that if the Members of the Parliamentary Business Committee were to take the matter up, they would confer a great boon upon a large portion of the trade. I think if they will consider the matter carefully, they will come to the conclusion that it is a great injustice.

I am acquainted with a barber, an ex-publican, also iron-workers, who are practising as dentists, and doubtless these men will be deemed eligible for registration.

I have written to several members of Parliament calling their attention to the Bill.

Perhaps some of the previous correspondents can suggest a plan of action; we must remember the old *unitate fortis.* Is it possible to have a meeting, and so discuss the best mode of action; something must be done, or the Odontological Society will have their desire granted?

W. Baker.

Stourbridge.

Sir,—I find from Kelly's Directory that there are 201 chemists in the country who are dental practitioners, beside 40 in London. Most, if not all, I have no doubt are skilful in both departments of dentistry, and in the administration of nitrous oxide gas, and it appears to me to be very unjust that simply because we know something of medicine and pharmacy, we should be refused registration. In September, 1874, I applied to the Royal College of Surgeons for admission to examination for the Dental Diploma, and was refused by the Board of Examiners in Dental Surgery for no other reason than that I was the proprietor of a chemist's business. Could not we "chemists and dentists" combine and act at once for our defence? I shall be glad to correspond and to receive communications from others respecting this.

B. W. WESTLAKE.

58, *Peascod Street, Windsor,*
February 19, 1878.

PATENT MEDICINES.

Sir,—As a contribution to the above subject, opened by Mr. Martindale in last week's Journal, I would suggest that the Medical Department of the Privy Council should have the power accorded to it by Parliament of compelling the owners of proprietary medicines which are recommended for the relief or cure of any bodily ailment to deposit with the said department a statement in writing of the exact composition of all such medicines, that a record be kept of the same, and power given to the said department to prohibit the sale of any proprietary medicines should they contain anything which in its opinion might be injurious to health. (I believe there is in France some such regulation in force.)

It might be said if the Poison Regulation Act be complied with danger would be avoided. My answer is, are there not a number of poisons other than those the sale of which is regulated by legislative enactment? Again, it would be said the sanction of the Privy Council having been obtained for the sale of those preparations the use of such medicines would be encouraged; undoubtedly that would be so, but no great harm could result to the public health thereby, and the owners of those compounds would have no objection to paying a handsome registration fee.

J. B. BARNES.

Knightsbridge, February 18, 1878.

REDUCED PRICES FOR PROPRIETARY ARTICLES.

Sir,—This is is a subject very difficult to deal with, and perhaps more suitable for discussion by the Trade Defence Association than the Council of the Pharmaceutical Society; but neither the one nor the other will be able to assist us much while we persist in such suicidal practices. The practice is becoming widespread, and a great many chemists are compelled to yield in self-defence; but it is, as pointed out last week, a very ruinous one, and must lead to very disastrous consequences.

We may take it for granted that reducing the price of medicines, proprietary or otherwise, does not increase the general demand, so that it is to the injury of the trade collectively to lower the price. Instead of trying to compete with the stores (miscalled co-operative) chemists would do well to combine together to buy large quantities for cash, and, selling at the proper marked price, leave a wider margin for profit.

When my customers ask what is the price of so-and-so, or do you sell it at the store price, I reply, "No, certainly not," and add that I do not profess to compete with them, and that I expect a fair and legitimate profit on everything I sell. I do not offer bargains, or sell things at cost price, and have no intention to do so.

There are at the present time several cogent reasons against reducing the prices of our goods. The cost of living has advanced considerably during the last twelve or fourteen years, house rents are going up and assistants' board and salaries have also increased, and as the stores have cut into everybody's business so we find grocers and others interfering with our trade.

Mr. Holloway has recently been sending circulars to all sorts of trades offering his medicines, so that we have not much to expect from some makers of patents, and his example is sure to be followed by others.

I must confess that I have not any remedy to offer, and think we must rely on the support of proprietors and wholesale dealers in asking the marked price for their goods.

My suggestion is, that the Trade Defence Association take the matter in hand and send round circulars to proprietors and wholesale dealers asking them to use their best endeavours and active co-operation in supporting the retail trade, supplying their goods as marked, and marking every package distinctly with the retail price. Proprietary articles may be divided into three classes:—

1st. Medicines proper, whether stamped or otherwise, to be sold by chemists only.

To these might appropriately be added foreign mineral waters.

2nd. Soaps and toilet articles, appropriate to chemists and perfumers.

3rd. Extract of meat and prepared foods, etc., may legitimately be sold by grocers and Italian warehousemen, as well as chemists.

Our trade is registered now, and any wholesale dealer may, on reference to Kelly's Post Office Directory of Chemists and Druggists, confine his circulars to the trade only if he wishes to do so.

Let us each one do what we can individually to bring about a better understanding on the part of the public in this matter, and show them the unfairness of the stores' method of doing business: and let us give our orders to the wholesale dealers who confine their attentions to our own trade and seek to do business through us.

FRATER.

LOW PRICES.

Sir,—I most willingly concur in the opinions expressed by your correspondent, Mr. J. R. Summers, in his letter, under the above heading in last week's Journal. What is to be done to stop "this cutting wave?" I hardly know, while chemists and druggists do not dwell together in brotherly unity in their respective towns, to the extent one could desire. That the practice of selling goods at such reduced prices is as ruinous in many ways as it is foolish, does not require much argument to demonstrate. That members of our profession (?), who have passed their examinations, should set so bad an example in this respect, is indeed deplorable.

I can testify to the "disagreeable" nature of transactions with customers who have purchased their "patents," etc., elsewhere, at these low prices.

Surely the chemists and druggists throughout the country, who have got into this wretched state of slavery, will be amenable to an appeal from their brethren who have not yet come to this sort of thing.

Let this important subject be well ventilated, and let us as dignified, honourable, and educated men, set our faces against this practice.

W. T. MARTIN.

Cliffe, Lewes,

X. Y. Z.—According to an answer received from the Inland Revenue Office (vol. iii. p. 327), quinine wine, if made according to the British Pharmacopœia, does not require a licence for its sale. This seems to imply that the other articles would, unless they were sold as "patent medicines."

"*Another Tom.*"—The receipe referred to was in accordance with the requirements of the correspondent. Other recipes for Brilliantine have been given in this Journal.

J. Sumner.—Your question will be best answered by a careful consideration of the Regulations of the Board of Examiners.

"*Occidens.*"—(1) *Hypnum populeum*; (2) *H. prælongum*; (3) *H. confertum*; (4) *H. rutabulum.*

"*Inquirer.*"—A good depilatory is a strong solution of sulphuret of barium made into a paste with starch. It should only be left in contact with the skin two or three minutes and then scraped off. A watery paste of 1 part of powdered crystallized sulphydrate of sodium, and 3 parts of prepared chalk has also been recommended.

Mr. Bates appears to have misunderstood the drift of the President's remarks, and not to have read a paragraph ina subsequent part of the report respecting a case of copying between two candidates.

E. Kemp.—In the one case thorium is treated as a monatomic and in the other as a diatomic element.

J. C. Sawer.—For a figure and description of the sumbul plant, see Bentley and Trimen's 'Medicinal Plants,' part xx; also see a note in the *Pharm. Journ.* [3], vol. vii., p. 329.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Reynolds, Mr. Willmott, Mr. Mackay, Mr. Macmillan, Mr. Clark, Mr. Pollard, Mr. Place, Mr. Turner, Cera Alb., Exam. in Arts, A. B. Q., A. P. S.

SPECTRUM ANALYSIS.*

BY PROFESSOR REDWOOD.

On a previous occasion† I endeavoured to explain some of the phenomena relating to spectrum analysis. But the subject is a large one, and many interesting illustrations were then omitted which I purpose bringing under notice this evening.

By spectrum analysis we are enabled to obtain evidence of the presence of substances through the effects they produce on light. When light is dispersed by means of a prism we obtain the well known phenomenon of the spectrum, of which the rainbow is a brilliant example. We shall have to work again this evening with dispersed light, and to exhibit several different kinds of spectra.

The light we shall employ will be produced by means of a Grove's battery of forty cells, the disruptive electrical discharge of which from charcoal terminals supplies the best representative we have of the light of the sun. If we produce this light in our lantern, and allow a small beam of it, escaping at a circular hole in the lantern, to pass through a prism, the beam or bundle of rays, which was travelling in a straight line from its source, will be bent or turned into a new direction in passing through the prism, and if it be now received on to a screen it will present the kind of spectrum originally produced by Sir Isaac Newton. The light, which before it entered the prism would have formed a round white illuminated spot on a screen, is now drawn out into an oblong spot of coloured light in which we discern the seven colours of Newton's spectrum. These colours, however, are not all homogeneous or monochromatic, but are some of them produced by the admixture or overlapping of two or more simple colours.

If, instead of allowing the light to escape from the lantern through a round hole, we cause it to pass through a narrow slit with parallel edges, and then through the prism, we get a spectrum of a different form, in which we have a smaller number of more elementary colours. This is the method which was adopted by Dr. Wollaston, and is now usually adopted, for producing the spectrum.

But a spectrum produced in either of those ways by the employment of artificial light, such as the electric or the Drummond light, differs in one respect from a similarly produced spectrum of the sun's light, the latter, when closely and carefully examined, being found to be intersected with numerous dark lines, called Fraunhöfer's dark lines, which are not present in any spectrum of artificial light such as we are using.

I must refer you to the drawing for a representation of these dark lines, but I may also throw an enlarged image on to the screen of a photograph of the spectrum of sun light in which Fraunhöfer's lines are shown, and I wish to draw especial attention to these dark lines, for these are the evidences we obtain by spectrum analysis of the composition of the sun and some of the stars, and it will be one of my objects this evening to explain the way in which we are enabled to infer from these lines in the spectra of the sun and stars the presence of certain chemical elements in those sources of light.

With the exception of the absence of these dark lines from the spectra produced by artificial light, there is a close resemblance in other respects between the spectrum of the sun's light and that produced by the incandescence of solid or liquid substances, provided the light so produced be of sufficient intensity and purity.

The electric light which we are using fulfils the required conditions,—that is to say, it is a light of great intensity and purity. In the production of this light chemical affinity in the galvanic battery develops potential electrical energy in the conducting wires which communicate with our lamp, and this when the charcoal terminals to the wires are brought into contact with each other becomes kinetic energy. If the contact were complete and the conducting power of the wire and terminals sufficient, electrical and magnetic forces would be developed in and around the conducting wire and the battery, but we should have no sensible evidence in the wire or terminals of the production of heat or light. It is when incomplete contact and insufficient conducting power exist between the terminals that heat and light become developed there, and for the production of these in the high degree necessary for our purpose we gradually separate the charcoal terminals in the lamp after they have been brought together, and thus cause the charcoal points to become intensely hot and luminous, the space between the separated points being occupied by a stream of intensely heated particles of incandescent charcoal.

These solid particles of charcoal are the real source of our light, and it is found that the light thus emitted by incandescent solid or liquid substances, and probably also by dense vapours if in sufficient quantity, when dispersed by passing through a prism, yields a spectrum which is continuous within its extreme limits. Such is the character of the spectrum of sunlight, with the exception of the dark lines I have alluded to, and such also, but without that exception, is the character of the spectrum produced with the electric light.

On the other hand, it is found that incandescent gases, when treated in the same way, yield spectra, the light of which is not continuous but is concentrated in bright bands with dark spaces between them. The light thus produced is also much less intense than that produced by incandescent solid or liquid substances, and I shall presently have to direct your attention more specifically to this point, and to show that a weak light may be rendered invisible by a strong light shining in its immediate vicinity, so that an object otherwise luminous or illuminated, if it be so to a slight extent only, may be rendered dark and invisible by a strong light.

Now it appears that each elementary gas, when heated to a sufficiently high temperature to render it luminous, yields a spectrum peculiar to itself, consisting usually of a small number of bright coloured bands, which are distinguished not only by their colours but also by the positions they occupy with reference to fixed points in the spectrum.

We will illustrate this by igniting two or three metals in the lamp and throwing their spectra on to the screen.

First we heat a piece of copper between the charcoal electrodes, the heat of which is sufficient to melt, boil, and vapourize the metal, and its luminous vapour is now throwing off rays of light, which by the dispersive power of the prism are being separated, sorted, and displayed on the screen, as red,

* Lecture delivered before the Pharmaceutical Society, February 20th, 1878.

† *Pharm. Journ.*, May 5, 1877.

green, and blue bands, with dark spaces between them.

We will next treat a piece of zinc in the same way, and you see we get a red band and three very beautiful blue bands, differing in position from those we had before.

And now we will replace the zinc by brass, which, being a compound metal, containing copper and zinc, gives a spectrum in which its elementary composition is represented by the peculiar bands of both metals.

This is the basis of spectrum analysis, namely, that substances capable of being converted into the state of gas or vapour and rendered luminous by heat, yield discontinuous spectra by which they can be distinguished.

These luminous gases are often to a certain extent distinguishable by the colour of the light they emit when viewed without the use of a prism. Thus, for instance, salts of lithium and strontium impart a red colour to flame, while sodium salts impart a yellow colour, thallium salts and boron salts a green colour, indium salts a blue colour, and potassium salts a violet colour. It has long been the practice for chemists to get or to seek evidence of the presence of some of these substances by observing the colour imparted by a compound to the flame of a candle or some other source of light in which there was previously no very decided colour. The indications afforded in this way, however, are not very distinctive or conclusive, for not only will two or more substances impart the same colour to flame, but the colour imparted by one substance will often completely mask the effect of another substance which may be present with it. Thus a mere trace of soda is sufficient to disguise the presence of a considerable quantity of potash, and a larger quantity of soda will also disguise the presence of lithia and strontia, while these in like manner will disguise potash.

Many years ago, in 1858, Mr. Cartmell suggested a method of separating the colours imparted to flame by the alkalies and alkaline earths, which consisted in the use of coloured media through which the light was allowed to pass. These media by selective absorption cut off the rays of some colours and allowed others to pass. Thus it was found that a solution of indigo completely absorbs the yellow colour imparted to flame by soda, while it allows the red of lithia and the violet of potash to pass; and glass coloured blue with cobalt absorbs the red of lithia as well as the yellow of soda, while it freely transmits the violet of potash.

This, which Mr. Cartmell called a photo-chemical method of analysis, was a step in advance of what had previously been done in that direction, but it was still an incomplete process, and it has now been superseded by the more perfect method of spectrum analysis.

The results obtained in spectrum analysis are due to the heterogeneous nature of ordinary white light, every ray of which consists of several rays of light of various colours, differing from each other in wave length and in the frequency of vibrations in the ethereal medium, in consequence of which these elementary coloured rays undergo different amounts of refraction or bending in passing through a prism, and they are thus separated from each other and occupy places in the spectrum which represent their several refrangibilities.

The method of spectrum analysis is used with advantage for revealing the presence of certain elements, especially when these are associated with other substances in quantities so small as to render their detection in any other way difficult if not impossible; but it is not commonly resorted to by chemists in cases in which other processes of analysis are applicable. Its importance and interest have been principally centred in the means it affords us for investigating the composition of bodies which are so distant from us that we cannot otherwise form any reasonable conception, founded on observation, of what they may consist of or contain. It is by this means only that we are enabled to obtain evidence of the existence in the sun and stars of certain chemical elements which form part of the globe we inhabit.

There is perhaps hardly a discovery that has been made or a theory propounded within the present century that has excited a greater amount of interest than this has among those who desire to investigate the phenomena of nature; but there are many, no doubt, who, although, in deference to authority, they have accepted the doctrine which is accredited among scientific men, are still anxious to obtain further insight of the grounds upon which this doctrine is based. Difficulties will inevitably present themselves and questions arise in the minds of such inquirers, and to the solution of some of these it will be my object to contribute this evening.

Now what is spectrum analysis supposed to tell us with reference to the sun and stars? It tells us that the sun is composed of incandescent matter,—that it consists of a nucleus which is either solid or liquid or a dense vapour like smoke, around which there is an atmosphere consisting of matter in the state of a luminous gas. Then it tells us that while the nucleus of the sun is intensely hot and luminous, some of the light which emanates from it is absorbed or obliterated in passing through the sun's atmosphere, and that this absorption of light by the atmosphere surrounding the sun is due to the presence in that atmosphere of certain chemical elements, which, if they were separately heated while in the state of gas to a sufficient extent to be luminous, would produce discontinuous spectra of various colours. It further tells us that the dark lines in the spectrum of the sun's light coincide in regard to the positions they occupy in the spectrum with the positions occupied by the bright and coloured lines in the discontinuous spectra of the vapours of numerous well known chemical elements, from which it is inferred that those elements are present there.

I may here show you, by throwing on to the screen, a representation of the telescopic appearance of the sun during the total eclipse of 1869. The body of the sun being obscured by the moon's shadow, we are enabled to see the bright atmosphere, called the corona, to which I have already alluded, and also the red prominences which are supposed to be principally incandescent hydrogen extending to a distance of five or six thousand miles from the body of the sun.

Such are facts and inferences arrived at by the prismatic analysis of the sun's light, aided to some extent by the use of the telescope.

But beyond what is absolutely revealed to us by the telescope and the prism, it is required for science to account, under conditions that may be reasonably supposed to exist, for the conversion of light into darkness—of bright and coloured lines into dark lines—and still more, for the production of these dark lines, which were so long an enigma, by the action upon pure and brilliant sunlight of matter, itself luminous or illuminated, existing in the atmosphere of the sun, which matter, if it were the sole source of the sun's light, would produce corresponding bright and coloured lines.

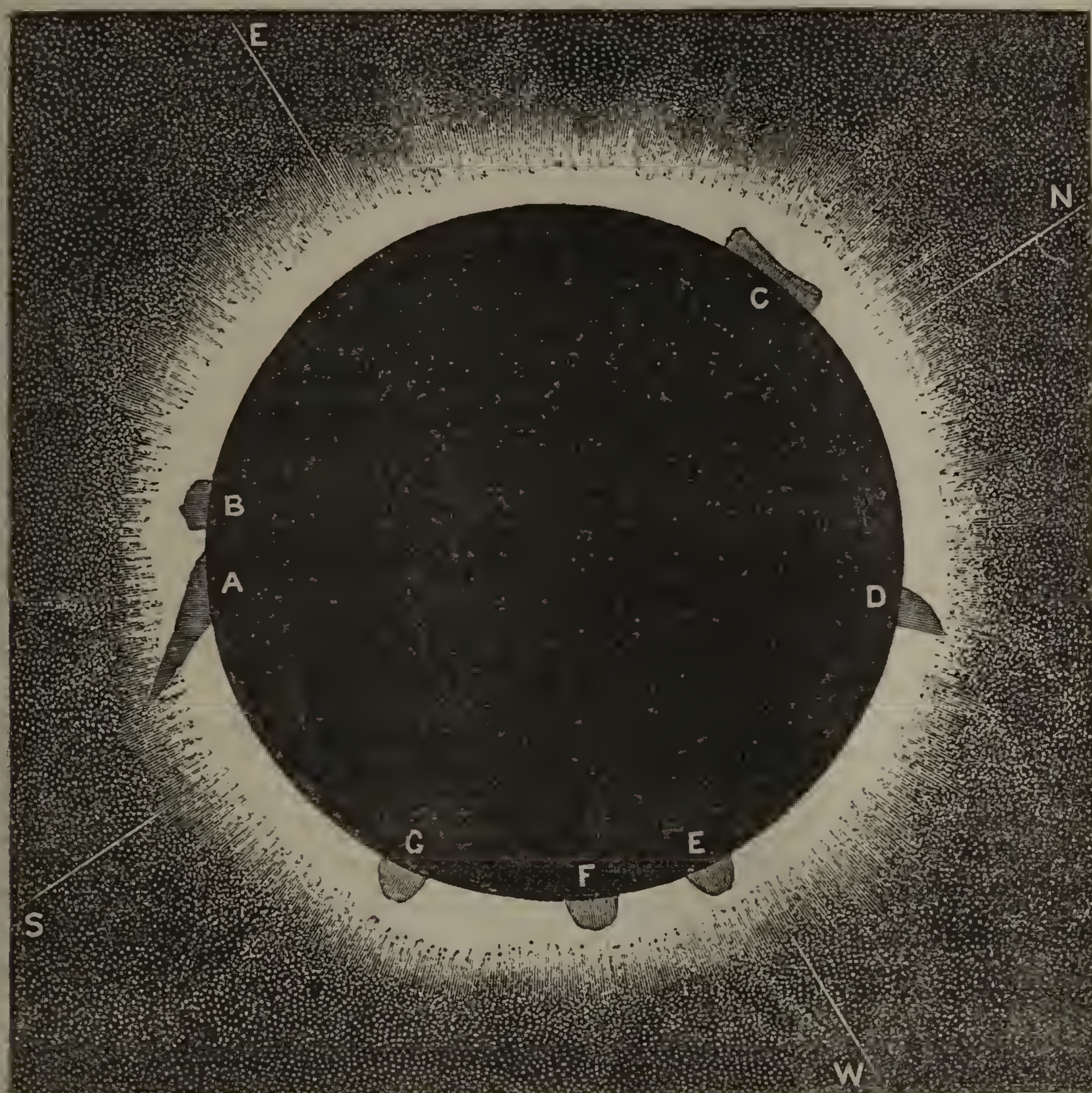

Fig. 1. Telescopic Appearance of the Sun during the Eclipse of 1869.

It is easy to say that the vapours of some fifteen or more well known chemical elements, forming an atmosphere around the sun, absorb just that kind of light which those same elements would emit if they were themselves the principal sources of the sun's light. Many persons accept such statements on the authority of those who make them, but with reference to a subject of such intense interest as this, we may be excused for wishing to see some practical demonstration of the evidences by which the proposed theory is supported. Let us then see what the evidences are which tend to show that the dark lines in the spectrum of the sun's light are due to the presence in the sun's atmosphere of gaseous bodies such as I have alluded to.

In bringing some of these evidences under your notice, I must in the first place refer to and partly recapitulate what I have on a previous occasion stated respecting the supposed nature of light.

It is assumed that light is caused by a vibratory motion, originating in the particles of matter, when these are acted upon by heat at a high temperature, and we use the term matter here to represent that which is affected by gravitation, and is capable of recognition by chemical means. But besides this matter, all space is supposed to be filled with an ethereal medium, sometimes called the luminiferous ether, which, as far as we know, is not affected by gravitation, and cannot be recognized by chemical means. This ether is the medium through which light as well as heat is conveyed through space. Like the more palpable forms of matter, the ether is supposed to consist of particles or atoms, which are infinitely smaller than the atoms of ponderable matter, infinitely small as those also must be.

We may, therefore, say that there are four physical states which we have reason to believe matter exists in; namely, the solid, the liquid, the gaseous, and the ethereal; the first three being those in which ponderable matter exists, and the last being that by means of which heat and light are communicated by radiation.

When the particles of matter, in any of its ponderable forms, are thrown into a state of vibratory motion by heat of some intensity, they become luminous as well as hot, and they are then capable of imparting a vibratory condition to the ethereal medium in contact with them, by which light and heat are conveyed with great velocity in straight lines, to distances which are only limited by the interposition of particles of ponderable matter which may lie in the path through which these lines, or rays, as they are called, are travelling. Heat and light in this state are said to be radiant, and radiation consists in the taking up by the ethereal medium of a certain kind of energy of motion, previously existing in the luminous body from which the radiant heat and light emanate.

When a body, whether it be solid, or liquid, or gaseous, lies in the path of a ray of heat or light, it will affect the ray in one or more of the following ways:—It may *absorb* the ray either wholly or partially, or it may *reflect* the ray either wholly or partially, or it may *transmit* the ray either wholly or partially. To the extent to which *absorption* takes place, the ray, as such, will be destroyed or obliterated—that is to say, the energy of vibration of the ethereal medium will be either taken up by the particles of matter, or they may be transmuted into some new form of energy in the absorbing body. To the extent to which *reflection* takes place, the ray, being rejected or thrown back, may be turned into some new direction, in which it will continue to pursue its course. To the extent to which *transmission* takes place, the ray will pass through the interposed body, and either continue to pursue an unaltered course, or it may be refracted or bent to a greater or less extent.

With regard to light, partial absorption, together with partial reflection or transmission of the rays of white light, produces colour. Thus, an object which appears coloured, when viewed by reflection, has absorbed part of the light, and reflects the other part. If, for instance, it appears red, it has absorbed all the other coloured light found in the spectrum, which with the red would constitute white light. And the same thing holds good with reference to the colour of a transparent object viewed by transmitted light. Heat and light are thus similarly affected, although the results do not produce in us similar sensations. In fact, there is reason to believe that heat and light, which we all know to be intimately associated, are the results of merely modified developments of the same physical cause. But heat vibrations are more easily excited than those of light. A body must have its particles considerably agitated and excited before it becomes luminous; and long before this it will have become sensibly hot. We might even go further and say, for it is an accepted doctrine, according to the theory of exchanges, that heat is radiated from bodies at all temperatures; and it is universally admitted that in this state of radiant heat, it is affected in every respect in the same way as light is. I shall therefore avail myself of means of illustration afforded by radiant heat, for the purpose of explaining some of the phenomena relating to light.

Now, the two influences exerted on light, and also on radiant heat by the particles of ponderable matter, which we shall principally have to consider, are those affecting radiation and absorption. Differences in the nature and condition of bodies, materially affect their power of radiating and also of absorbing both heat and light.

Let us first see how the rays of heat are thus affected. I have here two cylindrical tin vessels of equal dimensions, one of which is coated with lampblack, while the other retains its bright metallic surface. They have been simultaneously filled with boiling water, and each is furnished with a thermometer, affording easily discerned indications of changes of temperature. Exposed to the comparatively cold surrounding air, these vessels with the contained water undergo a process of cooling by radiation of heat into the atmosphere; and the thermometers will show the rates at which the cooling, or in other words the radiation or emission of heat from the surfaces of the vessels, will take place. You will observe that the thermometer in the vessel coated with lampblack indicates more rapid cooling than that indicated in the vessel with a bright metallic surface; and this tells us that a surface of lampblack radiates heat, that is, transfers the heat vibrations of its particles to the ethereal medium in contact with those particles, more freely and rapidly than a bright metallic surface does.

And now I want in the next place to show that lampblack and the bright metal possess the same relative powers of absorbing heat that we have seen they possess of radiating heat. I have two metallic vessels here, precisely similar in form and size, and so constructed that they give very marked indications, by the positions of the coloured liquids in the glass tubes attached to them, of the temperature of the air which each vessel contains. They are, in fact, air thermometers the air chambers of which are metallic. They are placed on opposite sides of a red hot copper ball, and at equal distances from it; but while one vessel presents a bright metallic surface, the other presents a blackened surface, to the ball. An equal number of heat rays from the hot ball falls on each; but those heat rays produce a more sensible heating effect upon the blackened surface than upon the bright metallic surface, as indicated by the rise of the coloured liquids.

This experiment is the reverse of the other, for while the other shows the respective facilities with which the heat vibrations are transferred from the particles of matter on two different but equally heated surfaces, to the ethereal medium, this shows the respective facilities with which the ethereal medium can transfer its heat vibrations back again to particles of ponderable matter; and we see from the results of the experiments that the power of absorbing corresponds with the power of radiating. The blackened surface, which is the best radiator, is also the best absorber.

Let us now see how the case stands with regard to light. We say that those bodies which are the best absorbers of light are also the best radiators of light. Here is a piece of platinum, one-half of which has been blackened by coating it with oxide of copper. The blackened part absorbs the light. It appears black because all the light that falls upon it is absorbed. The other part appears bright and metallic, because the light that falls upon it is not absorbed but is thrown off by reflection. If I heat this strongly by putting it into the furnace at a certain temperature it will begin to radiate light, and when it does so we shall find that the blackened part, which was the best absorber of light is also the best radiator of light. You perceive that the part that was black, now that it is made hot enough to radiate light, appears much more luminous than the other part, although both are equally hot.

Again, here I have a piece of white earthenware with a black pattern upon it. The black is absorbing, while the white is throwing off, reflecting and dispersing or scattering the light which falls upon it in different directions. If I cause this to radiate light by making it very hot, the pattern will be practically reversed—the black part will become intensely luminous and comparatively white, while the white part will be comparatively dark.

A clay tobacco-pipe, one-half of which has been painted over with a concentrated solution of nitrate of copper, and then heated to redness so as to leave the painted part covered with black oxide of copper, affords a good means of illustrating this effect.

Bearing in mind that we assume that radiant heat and light have a similar origin, and consist of a vibratory condition of the ethereal medium, we may obtain further evidence of the relation existing between radiation and absorption by observing the manner in which heat-rays are affected by substances that are capable of transmitting them to a greater or less extent.

Experiments on the transmission of heat show, that while some bodies allow heat-rays to pass through them, as light passes through transparent substances, others are, so to speak, opaque to the heat-rays, and others again allow some of the rays to pass, but absorb or suppress part of the heat, and this they do to variable extents, dependent upon the intensity or quality of the heat. Thus rock salt transmits nearly all the heat-rays that fall on it, and equally whatever the intensity or source of the heat may be; while alum, which is quite opaque, or to use the correct term, athermanous to heat of low intensity, is almost equally so to heat of any intensity; and glass, which allows the greater part of the sun's heat to pass through it, stops most of the heat from a common fire, and all the heat from a body if it be no hotter than boiling water.

But more than this, it appears from the results of experiments on the transmission of heat, that when a certain amount of heat has been absorbed in the attempt to transmit it through a substance—a plate of glass for example—the heat that has not been absorbed but has passed through the glass will pass through another plate of the same substance, with very little loss from absorption, thus showing that it is a particular sort or quality of heat that the glass absorbs, and that this being sifted out by the first transmission, what remains will pass through glass without further absorption.

These results, and others tending in the same direction, seem pretty clearly to show that radiant heat as well as light consists of compound rays, in which the wave-lengths and vibrations vary; and that the difference in the power which different substances possess, of radiating and absorbing heat-rays, depends upon the nature of the vibrations which those substances are susceptible of.

Upon such results have been founded the views entertained with reference to what is called selective radiation and absorption of heat and light rays, in accordance with which it is assumed that vibrating particles of matter can only impart to the ethereal medium vibrations or oscillations which agree in frequency, that is which synchronize, with their own vibrations, and similarly, that the particles of matter can only take up or absorb from the ethereal medium such vibrations as they are themselves susceptible of.

It is necessary here to observe the distinction between frequency of vibrations and amplitude of vibrations. Colour in light, and, as we believe, a corresponding property in heat, depend on frequency of vibration and consequent wave-length in the ether, just as a musical note depends on similar conditions in air; but intensity of light, like loudness of sound, depends, not on frequency of vibration, but on amplitude of excursion of the vibrating particles.

I may best explain this difference by referring to the case of a pendulum. The oscillations in the ethereal medium are comparable to the movements of a pendulum. They are movements to and fro across the line in which the ray of light travels. In a pendulum the frequency of the oscillations bears a fixed relation to the length of the pendulum, and is not at all influenced by the amplitude of the excursions of the oscillating body. So also in light, the colour of a ray of monochromatic light bears a fixed relation to the frequency of the oscillations in its source and medium of transmission, and is not affected by the amplitude or length of the excursions in the vibrating body or medium.

But while this is so with regard to colour, which wholly depends on wave-length and rapidity of vibration, it is otherwise with regard to intensity or amount of light, which depends entirely upon the amplitude of the excursions of the vibrating particles. Whatever the colour of the light may be, it may be either a strong light or a weak light, and it may be so weak as to be scarcely visible. We may even imagine the vibrations to be of the required frequency, but the excursions to be so small as to produce no sensible effect on our organs of vision.

Let me here also direct attention to the great difference that must exist between the particles or atoms of ponderable matter and those of the ethereal medium. It is true that we cannot form any definite idea of size in connection with these infinitely minute particles, but whatever may be the sizes of the atoms or smallest particles of ponderable matter, we cannot fail to conclude that the corresponding particles of the imponderable ether must be very much smaller.

This view of the subject is important in considering the transference of the vibrations of heat or light from the ethereal medium to the particles of ponderable matter, and especially in connection with the absorption of light-rays of greater intensity by radiating particles of matter which are throwing off similar rays of much less intensity.

Notwithstanding the evidences adduced which tend to prove that a substance which is capable of radiating any particular sort or quality of light, is equally capable of absorbing the same light, it may by some persons be found difficult to understand how the stronger light of the sun should be obliterated by the weaker light of the sun's atmosphere, and this not by interference but by absorption.

We know that two waves of light, just like two waves on the surface of water, may neutralize or destroy each other, but this which is called interference is perfectly distinct and different from the destruction of light by absorption; and what we have to account for is the destruction wholly or in part of certain rays of the strong light which emanates from the body of the sun, by the presence in the sun's atmosphere or chromosphere of vibrating particles of matter which, because their vibrations synchronize with such rays, are capable of absorbing, and practically do absorb them.

In accounting for this result it must be recollected that the light that emanates from the nucleus of the sun consists of vibrations in the ethereal medium which are of considerable amplitude, if we can say so of motion so infinitely small as these vibrations are; and that the light which originates in the sun's atmosphere is radiated from particles of ponderable matter the light of which being weak consists of vibrations of comparatively small amplitude.

It must also be recollected that it is not the radiated light of the sun's atmosphere, or in other words, it is not the vibrations of the ethereal medium there, but the vibrating and radiating particles of matter which it contains, that effect the absorption we have to account for.

Now when we consider the vast difference in size which we assume to exist between the particles of the ether and those of the ponderable matter in the sun's atmosphere, it will be evident that the smaller particles of the ether in their impact with the larger synchronizing particles of matter may transfer their energy to, without sensibly augmenting the amplitude of the vibrations of, the latter.

We do not usually find that the light vibrations of the luminiferous ether, when they are absorbed by ponderable matter, are capable of rendering these luminous, and we need not therefore be surprised that such an effect is not sensibly produced in the particles of matter contained in the sun's atmosphere.

On the other hand it is not necessary to suppose that the sun's atmosphere is rendered less luminous than it would otherwise have been, in consequence of the absorption by it of part of the sun's light, for the appearance of the dark lines in the spectrum may be sufficiently accounted for by the effect of the strong light of the other parts of the spectrum.

I may illustrate this by showing two lights side by side. I have here two jars containing combustible gases. One is light carburetted hydrogen or marsh gas, and the other is heavy carburetted hydrogen or olefiant gas. I light the former, and you see that it burns with a luminous, although not a very luminous flame; but now while that is burning I light the other which gives a far more luminous flame, and you see that the intensity of the light of the latter renders the former all but invisible.

Again, here is a metallic ball which has been heated until it is luminous. If the heat be only just sufficient to render it distinctly luminous in a dark place, it will be found that on putting it into the strong light of a lamp, the light it previously emitted will appear to be extinguished and it will become almost black.

The dark lines of the spectrum of the sun's light may therefore be considered to be dark principally by comparison with the much stronger light by which they are surrounded, and but for this effect we might find them to be coloured lines of light of comparatively low intensity.

Having thus brought under notice the sort of evidence on which the opinion is founded, and by which the theory is explained, that represents the dark lines in the spectra of the sun and stars to be caused by the presence of certain well known chemical elements in the atmosphere surrounding those luminaries, I purpose in concluding to show you on the screen the representation of some of the spectra that have been obtained and carefully mapped out, and to explain what the elements are that those spectra are considered to prove the presence of.

Let me once more call your attention to the appearance presented by the sun during a total eclipse. Here the body of the sun is obscured by the shadow of the moon, beyond which we observe red prominences that have been described as flames, and which are the most projecting portions of what appears to form a complete envelope five or six thousand miles in thickness, covering the nucleus or body of the sun. Mr. Lockyer calls this envelope the chromosphere. It appears to consist principally of incandescent hydrogen, with portions of magnesium and sodium, and some unknown element. Then beyond this chromosphere is the so-called corona, the principal atmosphere of the sun, which is probably illuminated more than luminous, and here we discover evidence of the presence of about fifteen different elements of which the following is a list:—

1. Sodium.	6. Iron.	11. Copper.
2. Calcium.	7. Chromium.	12. Zinc.
3. Barium.	8. Nickel.	13. Cadmium.
4. Magnesium.	9. Cobalt.	14. Titanium.
6. Aluminum.	10. Manganese.	15. Hydrogen.

M. Janssen, a French astronomer, was enabled during the eclipse of 1869, to obtain and figure the spectrum of the red prominences, which taken exclusively from that source of light gave, not dark lines, but bright lines corresponding in position with those of hydrogen, magnesium, and sodium, as shown in the representation I now throw on the screen.

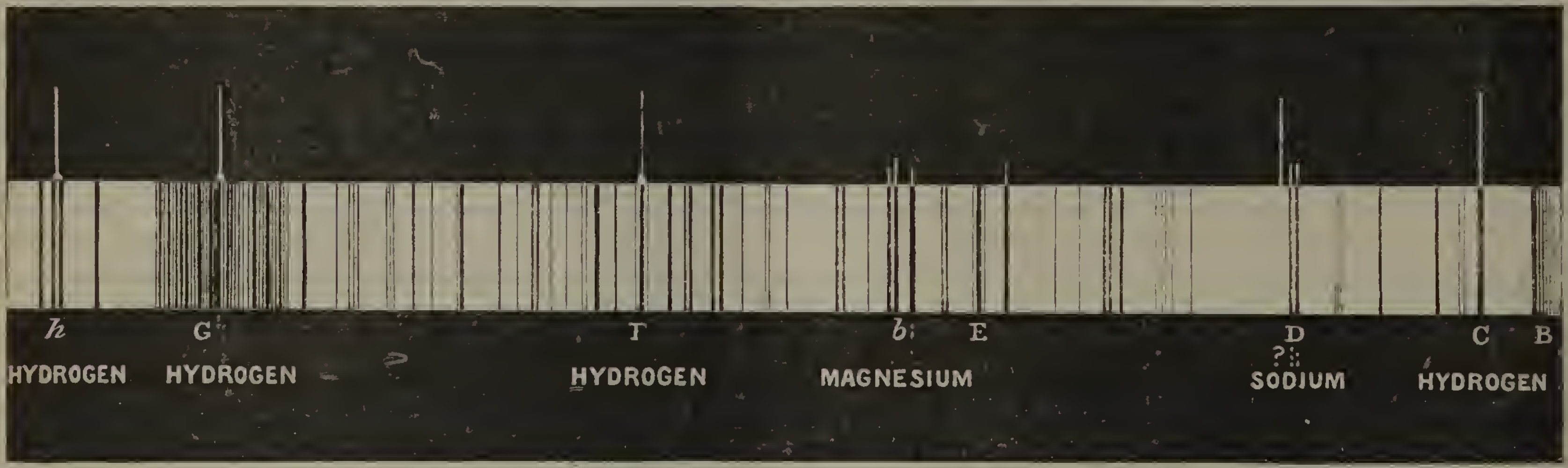

Fig. 2. Spectrum of the Red Prominences in the Sun's Chromosphere.

In this representation you will observe the spectrum of the chromosphere, or rather the part of it forming the red prominences, is given above in bright lines on a dark ground, and the ordinary spectrum of the sun's light is given below in dark lines on a bright ground. You will see that with one exception all the bright lines correspond with some of the dark lines, and they are the lines representing hydrogen, magnesium, and sodium. There is, however, one bright line which has no dark line corresponding to it, and in fact this appears at present to be produced by an unknown element. It is precisely thus that since the introduction of spectrum analysis our new elements have been discovered. It was thus that Mr. Crookes, having observed a beautiful green band in the spectrum produced from the combustion of a variety of pyrites, said "This answers to no known element, there must be a new element here, let us search for it," and he found his thallium. In the same way Bunsen and Kirchhoff, by the discovery of cæsium and rubidium, had previously laid the foundation for the revelations of spectrum analysis, and it now remains for scientific men to discover the element that produces this bright line in the spectrum of the sun's chromosphere.

Spectra have been taken of the light of the moon and planets, but they differ not essentially from those of the sun, thus confirming what we previously knew, that those bodies have no light of their own, but shine with the borrowed or reflected light of the sun.

Turning to the fixed stars, however, we have evidence that they, like the sun, are not merely illuminated but are luminous bodies, and that they consist of, or contain, many elements that are known to us. They yield spectra with dark lines similar to, but not identical with that of the sun's light. Here are the spectra of two stars, Aldebaran and Orionis, the latter of which presents this peculiarity, that hydrogen which is so prominently found in the spectra of the sun and some of the stars is entirely absent from this.

The nebulæ and comets also yield spectra, but in these the lines are mostly bright, which seems to indicate that those bodies consist wholly or principally of gaseous matter. In the nebulæ there appears to be little else than hydrogen and nitrogen, and in comets chiefly carbon.

And now having soared into the sky, explored the heavens, and analysed the sun and stars, we must return again to this lower world, which is but a speck in the universe, and we may contemplate with devout admiration the omnipotence of the creator and author of all things, by whom life and the conservation of energy are maintained, and will be extended, as we believe, to the end of time.

NOTE ON VON KOBELL'S TEST FOR BISMUTH.*

BY J. F. SAVORY AND H. G. GREENISH.

In the *Chemical News* of December 7, 1877, p. 249, under the heading "Detection of Bismuth," Mr. W. M. Hutchings draws attention to this test, and to an improvement he claims to have made in it. The test itself depends upon the formation of red iodide of bismuth, and is performed by mixing a solid bismuth compound, or the substance suspected to contain bismuth, with equal parts of iodide of potassium and sulphur, and heating on charcoal before the blow-pipe. A red sublimate indicates bismuth. Mr. Hutchings finds the mixture of iodide of potassium and sulphur to be very deliquescent, and finds it advantageous to replace them by iodide of copper. He ranks the test as one of the best, in some cases *the* best, for bismuth. It is especially applicable to the rapid detection of small quantities of bismuth in ores.

Professor F. Field, in the same journal, December 14, 1877, p. 267, calls attention to the delicacy of a test for bismuth, devised by himself and Professor Abel, which also depends upon the production of an iodide of bismuth, or perhaps, rather, of an iodide of bismuth and lead.

"It is based," says Professor Field, "upon a curious reaction exhibited by iodide of potassium in the joint presence of lead and bismuth. When iodide of potassium is added to a lead solution, iodide of lead is precipitated yellow, which re-dissolves on heating, and crystallizes again on cooling in brilliant golden yellow scales. If the least trace of bismuth is present, the precipitated scales are no longer yellow, but assume a dark orange or crimson tint, varying with the amount of bismuth present. The test is of such delicacy that ·00025 gr. of bismuth can be easily distinguished; the oxide of lead becoming dark orange; ·001 gr. gives a reddish brown tint, or a bright crimson, resembling in appearance chromate of silver."

A test liquid may be conveniently prepared by adding to a boiling solution of acetate of lead, containing about $\frac{1}{2}$ gr. to the ounce, solution of iodide of potassium in considerable excess. The re-solution of the iodide of lead at first precipitated is materially assisted by the addition of acetic acid. On cooling, iodide of lead is deposited in the characteristic brilliant scales.

A small quantity of this test liquid, including both supernatant liquid and precipitated scales, is transferred to a test tube, and gradually heated till solution takes place. The liquid to be tested is then added, and the whole allowed to cool. The separated scales will show a distinct change in colour if the smallest quantity of bismuth is present.

To test the delicacy of the reaction, one grain of oxynitrate of bismuth was dissolved in a litre of water, with the addition of nitric acid. Each cubic centimetre would contain one milligram of oxynitrate. A second, more dilute solution, was prepared, each cubic centimetre of which would contain one tenth of a milligram of oxynitrate.

5 c.c. of the test liquid were heated in a test tube till clear. 1 c.c. of the strong solution (1 milligram of oxynitrate) was added. The precipitated scales were dark in colour.

5 c.c. of the test liquid with $\frac{1}{10}$ c.c. of the strong solution ($\frac{1}{10}$ milligram of oxynitrate) gave a very decided change in colour.

A blank experiment gave the iodide of lead in the usual characteristic yellow.

As the quantity of iodide of lead present would evidently affect the delicacy of the reaction, a smaller quantity of the test liquid was next used, and the dilute solution of oxynitrate employed.

$\frac{1}{2}$ c.c. of test liquid, with 1 c.c. of the dilute solution ($\frac{1}{10}$ milligram of oxynitrate), gave a very decided reaction.

$\frac{1}{2}$ c.c. of test liquid, with $\frac{1}{10}$ c.c. of dilute solution ($\frac{1}{100}$ of a milligram of oxynitrate), gave a distinct change in colour. Much hydrochloric or nitric acid must be avoided; but boiling the precipitated scales with acetic acid appeared to heighten the delicacy. 5 c.c. of test liquid ($\frac{1}{50}$ milligram oxynitrate), boiled with strong acetic acid and cooled, gave a distinct change in colour; $\frac{1}{100}$ milligram was also evident.

To students of analytical chemistry this test will, we think, prove of assistance. By its means small quantities of bismuth may be detected with ease in the presence of lead; and most are familiar with the difficulties encountered in separating these two metals. We find that if the precipitated hydrates of lead and bismuth obtained in the chart (Attfield's Manual) usually employed in our laboratories, be dissolved in acetic acid, and a portion of the solution be added to the test liquid in the usual manner, an indication of the presence or absence of bismuth will be speedily obtained. The lead may then be detected in the remainder in the usual manner.

* Paper read at a meeting of the School of Pharmacy Students' Association.

CASTOR OIL SOAPS.

About seven years since Mr. Rimmington called attention in this Journal* to the value of castor oil in the preparation of a pure medicinal soap. The subject has since been carried further by M. Giffard, who contributes a paper to the *Bulletin des Travaux de la Sociétéde Pharmacie de Maine-et-Loire* for 1876–77, on the saponification of castor oil and its therapeutic applications.

Castor oil, by saponification, yields three fat acids, namely, margaric, ricinic, and ricinolic acids. Margaric and ricinic acids are present in only small proportions, but ricinolic acid is much more abundant, so that the compounds with bases may be considered to be practically true ricinolates. As a general character they are unctuous to the touch, and the author considers that this property might be frequently utilized in perfumery and soap making.

The ricinolates of potash and soda are obtained very readily, being produced by simple contact of the oil with strong ley. The potash soap is soft, and resembles glycerole of starch. The soda soap is opaque white, and possesses the characteristic unctuosity in a marked degree. It could be substituted for ordinary soap as an excipient in purgative pills, especially those of aloes. When triturated in a mortar it softens and can be readily incorporated with powders, forming a mass of good consistence.

To prepare this soda soap M. Giffard mixes 250 parts of castor oil with 100 parts of soapmakers' ley. After a few days, before the soap becomes too hard, it is kneaded with the hands in a saturated solution of chloride of sodium, and is then allowed to dry.

The ricinolate of magnesia is not obtained directly, but is prepared by double decomposition, by pouring a neutral solution of an alkaline ricinolate into a solution of sulphate of magnesia. The white curdy precipitate that forms is washed several times on a filter or a cloth. This ricinolate melts at 50° C.; it is insoluble in water, but soluble in alcohol, ether and chloroform. From the alcoholic and ethereal solutions, when allowed to evaporate slowly, it is deposited in silky crystalline needles. M. Giffard has experimented upon the internal administration of the ricinolate of magnesia, and found that it preserves the properties of its two components. It acts as a

* *Pharmaceutical Journal* [3], vol. i., p. 682.

gentle laxative which might be useful in constipation. As its soft consistence does not allow of its being made into pills without some addition, M. Giffard uses powdered rhubarb or magnesia. It then forms a moderate purgative, which does not produce colic or the least intestinal irritation.

The ricinolate of lime presents no points of interest.

The ricinolate of iron, obtained by double decomposition, is soluble in ether. M. Giffard suggests that if employed in the same proportions as other iron preparations the constipation which ordinarily attends their use might be avoided.

The lead soap is obtained by direct combination, like ordinary lead plaster. It hardens much less quickly and might therefore be used in the preparation of adhesive plasters.

The ricinolate of mercury is formed as a white precipitate, of rather firm consistence, upon mixing a solution of a mercuric salt with a solution of an alkaline ricinolate.

M. Giffard also prepared a number of other ricinolates, but none of them present points of pharmaceutical interest.

NOTE ON SALICYLATE OF ZINC.*

BY F. VIGIER.

The author prepares this salt, for use in hypodermic injection, by dissolving salicylic acid with heat in distilled water, and as the solution progresses adding successive small quantities of oxide of zinc suspended in a little water. Combination commences at once, and the addition of zinc is stopped when, after boiling the liquor, there is a slight deposit of the oxide. The liquid is then filtered, and upon cooling the salicylate of zinc crystallizes out in long needles. The mother liquor is decanted off and the crystals are dried in the open air, or in a stove between folds of filter paper. The product thus obtained is extremely white. The mother liquor upon evaporation yields a further quantity of salicylate of zinc. During the operation a porcelain capsule should be used and all metallic contact avoided, especially with iron, which would colour the liquid violet. If the solution should be slightly coloured it may be decolorized by boiling it with a little animal charcoal.

When concentrating the solution it is necessary to stop the boiling as soon as the water is insufficient to dissolve the salt, as under the prolonged action of heat the normal neutral salicylate of zinc is split up into salicylic acid, which remains dissolved, and a basic salicylate of zinc, which is deposited as a very light white powder.

The neutral crystalline salicylate of zinc contains three molecules of water of crystallization. None of this is lost upon exposure over sulphuric acid, but two molecules are given off after heating at 100° C. and the other at 150° C. The salt is very soluble in boiling water, from which it crystallizes on cooling in long, very brilliant silky white needles, having a satiny lustre. At first its taste is sweet, then styptic and bitter; 100 parts of water at 20° dissolve 5 parts of the salicylate. It is very soluble in alcohol, ether, and methylic alcohol, and upon evaporation of these solutions it is deposited in short silky needles usually grouped round a common centre. Carbon bisulphide does not dissolve it in the cold, but when boiling it takes up a small proportion, which again crystallizes upon the evaporation of the liquid. In oil of turpentine it is insoluble. Sulphuric acid dissolves it without coloration if the salt is pure. Nitric acid attacks it with difficulty in the cold; when heated it dissolves it with evolution of nitrous vapours. Hydrochloric acid also acts upon it with difficulty in the cold, but dissolves it when heated, and upon cooling the solution forms a crystalline mass. Like salicylic acid an aqueous solution of salicylate of zinc is coloured violet by ferric chloride. Ammonia produces in the aqueous solution a precipitate soluble in an excess of the precipitant. Hydrosulphate of ammonia gives a white precipitate of sulphide of zinc.

The basic salicylate of zinc contains no water of crystallization and is nearly insoluble in water, alcohol, and ether. Upon heating it with salicylic acid and a sufficient quantity of water the neutral salicylate is reformed.

Salicylate of zinc is reported to have been employed by Drs. Poignet and Desmarres successfully as an astringent antiseptic in blenorrhagia, cancerous sores in the tongue, purulent ophthalmia, etc. The proportion used for blenorrhagia is 0·5 to 1 gram in 100 grams of distilled water, and for cancerous sores a 4 per cent. solution.

* Journal de Pharmacie et de Chimie [4], vol. xvii., p. 41.

SOME ANALYSES OF DIALYSED IRON.*

BY HENRY TRIMBLE.

No pharmaceutical preparation of recent times has met with such universal favour as dialysed iron. The physician employs it with marked success, and the pharmacist refers to it as a type of the so called elegant remedies to which he has of late years directed a great part of his energy. So far it has chiefly been prepared by a few wholesale manufacturers, who are constantly calling attention to its strength, purity and general superiority over the other iron compounds. Fearing that the strength of the solution might be sacrificed somewhat in attaining the much-desired elegance, I procured of the leading manufacturers of Philadelphia six samples, and estimated the iron and chlorine by the following process.

About five grams of the solution were taken, diluted with water, treated with ammonic hydrate and heated gently until all the iron was precipitated. This was then filtered off, washed thoroughly, ignited, and weighed as Fe_2O_3. The filtrate and washings were heated to expel excess of ammonia, and treated with hydric and argentic nitrates. The mixture was heated and agitated until the resulting argentic chloride cohered, then filtered and the collected precipitate washed, ignited and weighed as AgCl, from which the percentage of chlorine was calculated.

The following table, containing a summary of the analyses, explains itself:—

	Per cent. Fe_2O_3.	Per cent. Cl.	Per cent. of the salt.	Formula.
I.	3·143	·140	3·192	$29Fe_2O_3.Fe_2Cl_6$.
II.	3·442	·154	3·497	$29Fe_2O_3.Fe_2Cl_6$.
III.	2·394	·156	2·514	$19Fe_2O_3.Fe_2Cl_6$.
IV.	2·583	·286	2·804	$11Fe_2O_3.Fe_2Cl_6$.
V.	4·677	·198	4·831	$31Fe_2O_3.Fe_2Cl_6$.
VI.	2·874	·235	3·058	$16Fe_2O_3.Fe_2Cl_6$.

There would be no criticism to offer on these results, were it not for the fact that the circulars of these manufacturers state that the solutions contain five per cent. of ferric oxychloride, or, as one asserts, of ferric oxide free from hydric chloride, both of which statements are incorrect, and as yet the latter has proved impossible.

Finally, we see that only the manufacturers are at fault, and that a solution of dialysed iron can be and is prepared, which, compared with the iron, contains a much smaller proportion of chlorine than has heretofore been supposed, three of the samples showing this, the only objection to them being that they contain too large a percentage of water.

* From the American Journal of Pharmacy, February, 1878.

The Pharmaceutical Journal.

SATURDAY, MARCH 2, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE DENTAL PRACTITIONERS' BILL.

THE opinion we expressed some weeks since, in reference to the possible interpretation of the fifth section of this Bill, defining the persons who are to be entitled to registration, as being prejudicial to chemists and druggists who practise dentistry has been very generally acquiesced in, as will be seen from the letters that have been published on the subject, and it is satisfactory to find that Sir JOHN LUBBOCK, as one of the promoters of the Bill, recognizes the propriety of striking out the words which might give rise to ambiguity and admit of being interpreted as excluding from registration chemists and druggists who are at present engaged in dental practice.

As regards the general object of the Bill, to restrict the use of the title "dentist" to those who possess competent knowledge and skill for the proper performance of the duties they undertake, we cordially agree with the preamble of the Bill, which states that it is expedient that provision be made for the registration of persons officially qualified to practise as dentists in the United Kingdom. The only point to which we took exception was the provision that those entitled to be registered under the proposed Act must have been engaged in the practice of dentistry, either separately or in conjunction with the practice of medicine or surgery.

It very often happens that in the decision of questions relating to Acts of Parliament, difficulty is experienced in giving proper effect to the meaning intended originally to be expressed by the phraseology of particular clauses, and the definition of persons entitled to registration appeared to admit of an interpretation opposed to what may reasonably be supposed to have been the intention of the promoters of the Bill. As very fairly put by Mr. MAGGS in his letter to Sir JOHN LUBBOCK, that definition may be interpreted as indicating only two classes of persons, viz.;—

1. Those who have practised dentistry exclusively, and,

2. Those surgeons who have included dentistry in their practice.

If such a view were taken after the passing of the Bill, it is possible that a good case might still be made for those chemists and druggists who have been in the habit of combining dentistry with their business as pharmacists; but in any case there would be incurred the undesirable trouble and expense of urging their claim to continue practice as before the passing of the Bill. Moreover, if the clause were allowed to pass as it now stands it might be taken advantage of to the detriment of chemists and druggists, for in the unregulated condition in which the practice of dentistry has so long been, it is not to be wondered at that heartburnings and jealousy should be frequent. Under such conditions it would not be surprising if qualified practitioners, smarting under the injury inflicted upon them by quacks and pretenders, should take a narrow view of the restrictions imposed by the Act and endeavour to give them a wider application than they were intended to have.

As regards this latter point, we do not at all question that the intention of the promoters of this measure is simply that of preventing ignorant and inexperienced persons from imposing upon the public by styling themselves dentists, and in this respect chemists and druggists who practise dentistry may regard it as a protective measure. But however desirable such an object may be, existing rights acquired by usage must be regarded, and it would certainly be inconsistent to admit to registration a number of ignorant persons who have never done anything but draw teeth, while at the same time those chemists and druggists who have combined dentistry with pharmacy, were excluded and summarily compelled to give up this part of their business.

We are glad to be able to state that the propriety of regarding such existing rights is admitted by those who are striving to bring about reform in the the practice of dentistry, and we have been favoured by Mr. JOHN WADE with a letter from the Honorary Secretary of the Dental Reform Committee in which he fully admits this in reference to chemists and druggists. In consequence of the representations of the case made by the Pharmaceutical Society and by various individuals, SIR JOHN LUBBOCK has expressed himself as being quite disposed to adopt such an amendment of the Bill as will secure to chemists and druggists practising dentistry the same consideration that is accorded to other practitioners.

We may therefore regard this matter of amendment of the Bill as having been already provided for satisfactorily, and that there is now probably no further occasion to take action in reference to it. We may, however, mention that a form of petition is being circulated for signature by Mr. WESTLAKE of Windsor, in which it is proposed that the word "pharmacy" should be inserted after the word "surgery" in the sentence we have quoted above from the fifth section of the Bill.

The letters published in the present and previous numbers of this Journal likewise show that several individual communications have been addressed to Sir John Lubbock, and the Chemists and Druggists' Trade Association brings up the rear with a deputation from Birmingham.

The only remaining question now appears to be as to the nature of the amendment. Mr. Gostling and Mr. Westlake suggest the insertion of the word "pharmacy," so that the passage objected to would then read thus, "separately or in conjunction with medicine, surgery, or pharmacy." Mr. Maggs suggests that the amendment should be of such a nature as to indicate the intention "that all who have practised dentistry hitherto, whether in conjunction with surgery or not, should be admissible to registration. The latter appears to us the more simple course, and probably the amendment would best take the form of omitting the words "either separately or in conjunction with medicine or surgery." Though we are not at present in a position to speak positively on this point we can state that it is most probable this will be done.

While dealing with this subject we think it desirable to point out an error into which our contemporary, the *British Medical Journal*, has fallen in speaking of the opposition offered to the Bill by chemists and druggists. After expressing the opinion that they are right in taking that course, it goes on to state that "this Bill proposes to put every existing chemist who has ever pulled a tooth in the position of (dental) surgeon and they think it reasonable that their successors in business should all have the same privilege." These few words contain two flagrant mis-statements: the Bill does not propose to put any chemists and druggists in the position of dental surgeons, neither do chemists and druggists seek to claim that position for themselves or for their successors. All they demand is that those among them who have hitherto been practising *bonâ fide* as dentists shall be allowed to continue doing so and to be admitted to registration in common with others who have been practising *bonâ fide* as dentists. As regards future chemists and druggists who may desire to practise dentistry, not a suggestion has yet been offered in opposition to their being subordinated to the provisions of the Bill intended to secure the competence of dental practitioners in general. That many future chemists and druggists will satisfactorily and efficiently perform the functions of dentists we do not doubt any more than we doubt the fact that many of them have likewise done this hitherto.

THE CHEMISTS' BALL.

A Meeting of the Committee of the Chemists' Ball was held on Monday evening the February 18, when a most favourable report was presented by the Honorary Secretary. The Stewards, and those who were present at the Ball, will learn with satisfaction that the Committee was enabled to hand over the sum of thirty guineas to the Benevolent Fund of the Pharmaceutical Society—this being the largest amount the Committee has yet given. It is only fair to add that the great success attending the Ball this year is largely due to the exertions of Mr. Walter Hills, the Honorary Secretary.

A WRONG MEDICINE.

The last number of the *Bulletin Commercial* reports the prosecution of a *pharmacien* for the supply of a wrong medicine, resulting in a fatal accident. The medicine ordered for the patient was an enema of sulphate of soda and syrup of buckthorn; but that administered was a preparation containing chloroform. Shortly after the patient fell asleep and died the same night without waking. The responsibility for the substitution was disputed; on the one hand the *pharmacien* alleged that the messenger had laid the bottle down after it had been given to him and taken up a wrong one from the counter; on the other, the messenger swore that he had not. The medical evidence was also conflicting as to whether the death was really caused by the chloroform. The *pharmacien* was, however, condemned to pay a penalty of 200 francs, and a further sum of 1500 francs as damages to the mother of the patient.

It is rather curious that a contemporary whose censorship over things in general has this month been extended to the manner in which translations from the English are made for a celebrated French journal, has itself, when referring to this case on another page, through a misreading of the word *lavement*, been betrayed into a ludicrous expression of doubt as to syrup of buckthorn being used as a lotion.

THE EVENING MEETING.

An Evening Meeting of the Pharmaceutical Society will be held on Wednesday next. The chair will be taken at half-past eight o'clock precisely.

THE SOCIETY'S CALENDAR.

The Calendar of the Pharmaceutical Society for 1878 is now ready, and copies may be had upon application to the Secretary, 17, Bloomsbury Square. Full details as to its contents, price, etc., will be found in an announcement in the Advertising sheet.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting of this Association will be held on Wednesday next, March 6, when Mr. Wallis will read a paper on "Sponge."

Transactions of the Pharmaceutical Society.

NORTH BRITISH BRANCH.

The fifth meeting of the present session was held in the Society's rooms, 119a, George Street, Edinburgh, on Friday evening, 22nd February. Mr. J. B. Stephenson, President of the Branch, in the chair.

Mr. H. B. Baildon, B.A., read a continuation of his paper on "Botany," which will be printed in a future number of this Journal.

At the conclusion of the paper, the President moved a hearty vote of thanks to Mr. Baildon; this was seconded by the Rev. Dr. Kerr, who complimented Mr. Baildon for the beauty of the language in which his paper was written. The motion was very cordially acknowledged.

Mr. W. Ivison Macadam, Lecturer on Chemistry, Edinburgh, then read the following paper on Californian Wines:—

THE CHEMICAL COMPOSITION OF CALIFORNIAN WINES.

BY W. IVISON MACADAM,

Lecturer on Chemistry, Edinburgh.

Until lately the principal part of the wines obtainable were those grown on the continent of Europe. Within the last few years, however, several new countries have forwarded small consignments to the British market.

For the proper growth of the wine vine, it is necessary that the climate should not be liable to rapid changes of temperature, for although a hard frost in the winter, when the sap is not ascending, does no damage but rather good to the plant, yet during the spring months the vine must not be exposed to sudden frosts, else the tender fruit branches will be liable to be frosted and their proper growth damaged or permanently destroyed. It is also necessary that the vines should not be exposed to heavy rains during the autumn months, as these deteriorate the fruit crop.

On the continent of America the State of California is particularly adapted to the growth of the vine, for although the temperature is somewhat low during winter, yet the spring, summer and autumn months may be depended on. For the last few years much attention has been devoted in the State to the growth of the better class of wine vine, and great improvement has been made in the vineyards by the introduction from Europe of plants and graftings of the Riessling, Malvoisie, Zinfandel, Orleans, Berger and other high class varieties. The wines manufactured are large in number and include white and red varieties, ports, champagne, etc.

Samples of port, malaga, sherry and a special variety called "Mount Vineyard" were obtained direct from the American vineyards, and submitted to analysis, when they gave the following results:—

PORT.

Specific Gravity of Wine	1022·96
,, ,, ,, *minus* Alcohol	1035·03
Specific Gravity of Distillate	977·01
Percentage of Alcohol *by Weight.*	15·99
,, ,, ,, *Volume.*	19·00

In One Imperial Gallon.

Total Dry Residue	8439·90 grains.
,, ,, *minus* Ash	8194·90 ,,
,, Ash	245·00 ,,
Grape Sugar	5833·00 ,,
Fixed Acid calculated as Tartaric Acid	249·90 ,,
Volatile Acid calculated as Acetic Acid	42·00 ,,

In 100 parts.

Dry Residue	11·786 grains.
,, ,, *minus* Ash	11·444 ,,
Ash	0·342 ,,
Grape Sugar	8·146 ,,
Fixed Acid calculated as Tartaric Acid	0·357 ,,
Volatile Acid calculated as Acetic Acid	0·060 ,,

Taste, sweet.
Colour, rich.

The specific gravity of this Wine is higher than is usual in the case of Portuguese Ports. This is due to the large amount of grape sugar, which also greatly increases the dry residue, which is fully 2 per cent. above the average amount to be obtained in "Natural" Ports.

MALAGA.

Specific Gravity of Wine	1053·56
,, ,, ,, *minus* Ash	1073·27
,, ,, of Distillate	978·66
Percentage of Alcohol *by Weight.*	14·25
,, ,, *by Volume*	17·33

In One Imperial Gallon.

Total Dry Residue	14249·90 grains.
,, ,, *minus* Ash	13974·10 ,,
Total Ash	275·80 ,,
Grape Sugar	10769·23 ,,
Fixed Acid, calculated as Tartaric Acid	254·80 ,,
Volatile Acid, calculated as Acetic Acid	47·60 ,,

In 100 parts.

Dry Residue	19·321 grains.
,, ,, *minus* Ash	18·948 ,,
Ash	0·373 ,,
Grape Sugar	14·602 ,,
Fixed Acid, calculated as Tartaric Acid	0·364 ,,
Volatile Acid, calculated as Acetic Acid	0·063 ,,

Taste, sweet.
Colour, good.

The amount of grape sugar is very large, which increases the weight of the dry residue and specific gravity of the wine.

SHERRY.

Specific Gravity of Wine	993·22
,, ,, ,, *minus* Alcohol	1114·86
Specific Gravity of Distillate	978·83
Percentage of Alcohol *by Weight.*	14·60
,, ,, ,, *Volume.*	17·70

In One Imperial Gallon.

Total Dry Residue	2701·30 grains.
,, ,, ,, *minus* Ash	2536·80 ,,
,, Ash	164·50 ,,
Grape Sugar	1129·03 ,,
Fixed Acid, calculated as Tartaric Acid	292·85 ,,
Volatile Acid, calculated as Acetic Acid	26·60 ,,

In 100 parts.

Dry Residue	3·884 grains.
,, ,, *minus* Ash	3·648 ,,
Ash	0·236 ,,
Grape Sugar	1·623 ,,
Fixed Acid, calculated as Tartaric Acid	0·381 ,,
Volatile Acid, calculated as Acetic Acid	0·038 ,,

Taste, dry.
Colour, pale.

This analysis agrees closely with Spanish "Natural" Sherries.

"Mount Vineyard."

Specific Gravity of Wine	1016·29
" " " *minus* Alcohol	1035·89
Specific Gravity of Distillate	978·98
Percentage of Alcohol *by Weight*	14·00
" " " " *Volume*	17·00

In One Imperial Gallon.

Total Dry Residue	6679·40	grains.
" " " *minus* Ash	6517·00	"
" Ash	162·40	"
Grape Sugar	5185·18	"
Fixed Acid, calculated as Tartaric Acid	235·20	"
Volatile Acid, calculated as Acetic Acid	32·20	"

In 100 *parts.*

Dry Residue	9·389	grains.
" " *minus* Ash	9·161	"
Ash	0·228	"
Grape Sugar	7·288	"
Fixed Acid, calculated as Tartaric Acid	0·336	"
Volatile Acid, calculated as Acetic Acid	0·046	"

Taste, sweet.
Colour, pale.

A large amount of grape sugar present.

These results show that the percentage of alcohol in all of the wines closely resembles the amount generally found in "natural" European varieties, and that the acid, both *fixed* and *volatile*, is below the average; that the high specific gravities of the port, malaga, and Mount Vineyard are due to the presence of considerable quantities of grape sugar, which has doubtless been added to the wine so as to suit the taste of consumers. From the same cause the dry residues obtained from those three wines is considerable. In the sherry the whole of the results point to a wine very closely allied to the Spanish varieties of "natural" sherry. The ash in all the wines is small in amount.

In taste the sherry resembles the dry class of wines, whilst the port, malaga and "Mount Vineyard" are sweet to taste. The port has a rich colour, whilst the sherry and "Mount Vineyard" are pale and bright. On account of the wines being somewhat new, they lack in a degree the bouquet of older wines, but doubtless when aged the ethers will be formed in larger quantities and supply what is at present wanting. They are good sound wines, and somewhat agreeable to taste.

The home consumption of these wines in the State of Californian is considerably above 2,500,000 gallons per year. The export in 1873 was 490,568 gallons, whilst for the first six months of 1877 the total amount sent out of the State was 452,392 gallons, thus showing a considerable increase. The most of the exported material is used on the American continent, whilst smaller amounts find their way to more distant markets. In 1876 Great Britain received 1033½ gallons, being the first consignment, whilst Germany obtained 1525 gallons.

A discussion followed Mr. Macadam's paper, in which Mr. Mackay and the Rev. Dr. Kerr took part. On the motion of Mr. Stephenson, seconded by Mr. Mackay, a very hearty vote of thanks was accorded to Mr. Macadam for his interesting paper.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The ninth general meeting was held at the Royal Institution, February 14th, 1878. The President, Mr. T. Fell Abraham, in the chair.

The minutes of the previous meeting were read and confirmed.

The donations to the Library were announced, and to the Museum a specimen of Ball fruit from Rangoon, and a specimen of Honey from Chili, from Messrs. Bathgate and Son. Votes of thanks were accorded the donors.

Mr. John Williams was duly elected a member.

Mr. Arthur G. Haddock read a paper on "The Theory of Flame." This paper will be printed in a future number of the Journal.

A lengthy discussion on the paper followed, in which the President, Messrs. A. C. Abraham, Davies, Evans, Hargreaves, Mason, Symes, Tanner, and others took part.

On the motion of Dr. Symes, seconded by Mr. A. H. Mason, F.C.S., a cordial vote of thanks was given to Mr. Haddock for his interesting paper.

CHEMISTS AND DRUGGISTS' TRADE ASSOCIATION.

A meeting of the Executive Committee was held at the office of the Association, 23, Burlington Chambers, New Street, Birmingham, on Friday the 22nd ult., at 1·30 p.m. Mr. S. U. Jones (Leamington), President.

After a discussion of the Dental Practitioners' Bill by the solicitor and several members of the Committee, it was resolved that the President, together with the London members of the Executive Committee and the solicitor of the Association, should wait upon the promoters of the Dental Practitioners' Bill to urge such modifications in the Bill as shall give to chemists and druggists the right to be registered under it, and such other alterations as they may deem desirable.

The solicitor said he had perused Dr. Lush's Medical Act (1858) Amendment Bill, and no part of the Bill appeared to affect the interests of chemists and druggists.

The President said he was of the same opinion, and he should be glad if the solicitor would report upon pending cases under the Apothecaries Act.

[*** The remainder of the report, relating to the subject of Counter Practice, being merely an expression of opinion involving a personal attack upon an official of the Pharmaceutical Society, and for which there is no reasonable justification, its publication in these pages would be inappropriate.—Ed. Pharm. Journ.]

LEEDS CHEMISTS' ASSISTANTS' ASSOCIATION.

On February 14 the inaugural meeting of this Association took place (preceded by a dinner), at the Griffin Hotel, when a large gathering of masters and assistants was present, supported by prominent members of the medical and scientific societies. The Association is intended, by means of annual subscriptions of the members and with assistance from employers in the trade as honorary members, to promote and diffuse scientific and commercial knowledge amongst the assistants, by providing for them a room where they can meet for social intercourse and interchange of opinions. Weekly papers will be read on some given subject connected with the business to be followed by discussion. It is intended also to invite professors of standing to give lectures, and it is hoped that the employers will freely give their support, as an institution with these views must necessarily raise the status of the assistants, and thus advance the interest of their employers, and help the capital of the West Riding to maintain its proud position.

Mr. Councillor Stead occupied the chair, supported by Mr. Place as vice, and many influential friends. After the usual loyal toasts,

Mr. Highmoor proposed "The Medical Profession." He said the company present augured well for the progress of pharmacy. The medical profession had high claims on all classes of society, especially the chemists, and he esteemed it a high privilege to be associated with them in their endeavours to alleviate the sufferings of mankind, and in meetings of this kind to have their support, and as chemists to render them as much assistance as lay within our province. Speaking of the relations which ought to exist between the physician and the pharmacist, he said the Pharmaceutical Society is an examining body, but the students have to find their education where they can. In his opinion the medical profession stood in their own light and in the way of pharmaceutical progress, in not having chairs of pharmacy established in their own colleges, and making the attendance of students compulsory. By such a course this very important subject might be studied with an advantage that few medical pupils have any idea of. The pharmaceutical examinations would be greatly assisted, their value raised by good example, and a glorious future opened out for the field of pharmacy. The relationship between the two bodies would be enhanced, and they would mutually support each other's interest. The relation of pharmacy at present with the medical profession was very unsatisfactory and extremely delicate. Whilst the chemist and druggist could never be restricted from using the knowledge he had acquired, in respect to the action of simple medicines, or even their application in simple cases (which the profession would not look at), yet he is subject to a great temptation of falling into a custom of counter-prescribing, simply to accommodate his family customers. All this might be obviated were chairs of pharmacy established in connection with the profession, in which constant intercourse would lead to mutual respect and esteem for each other's calling.

The Chairman, in giving "Success to our Annual Gathering," expressed his regret that more of the chemists of the town were not present to show that their relations with their assistants could be something other than a mere business transaction; but no doubt when they found the great importance of the movement they would heartily support it. He reminded the assistants that they had shorter hours than formerly, and consequently increased opportunities for self-improvement. In looking at the results of the examination which they had now to pass, he found the percentage of failures to be 46 per cent., this should not be so, with such advanced facilities of education at the present time. He could not account for it, but he thought the rejections in the Preliminary examinations were to be traced to the fact that young men delayed going to them so long that they forgot much they had learned at school. When once they had passed the Minor he strongly urged them to go manfully forward and study for the Major. These examinations had tended to elevate the trade, and there could be little doubt that the improvement would continue until at length the chemists and druggists would be regarded as members of a learned profession.

The Rev. James H. McCheane, President of the Leeds Philosophical Society, proposed "The Yorkshire College of Science." He reminded them that he was one of the governors of that college, and it might be imputed to him that in commending such a toast he was pleading for "our noble selves." Well, he was ready to maintain that the Yorkshire College was a very noble feature indeed in the recent history of Leeds. It was increasing in usefulness and influence every day, and very soon its new buildings would begin to rise under good auspices. It was obvious what great service such an institution was capable of rendering to chemists' assistants in connection with their daily business, as well as in regard to general and scientific culture. The list of Gilchrist lectures for the present season was very significant of the advance the town had been making. Thanks to the college, all the lecturers and scientific teachers were Leeds men, whereas two years ago the names were those of strangers. He presumed that the invitation he had received was chiefly owing to his being the President of the Leeds Philosophical Society. In that capacity he was clearly under an obligation to evince his interest in any association that was linked as this was with the actual practice, as well as with the principles of science, and in these days, when there was so much to separate people into sects and parties, any movement was to be welcomed by the philosophical mind that brought young men together on the common ground, not of party, or of prejudice, but of their membership in one common calling, which was as honourable and useful as any business or profession that he knew of. As a clergyman he was bound to act upon the old saying: "Homo sum, nihil humani a me alienum puto." "I am a man, and in everything that concerns the needs or the nature of man it behoves me to take an interest,"—a somewhat free, but not erroneous, translation, and if there was one calling in life that was concerned with human needs, surely it was theirs. The days were past when in the celebrated Pickwick trial a chemist, in agony of mind, asked the judge to be excused attending court as he wanted to get back to his only assistant, whose mind was dark as to the difference between Epsom salts and oxalic acid. These things were of the dangers of the times that were past and of those times only. By the contact of mind with mind, as in such social and intellectual meetings as that, a most valuable help was secured to the education of both mind and character. He wished God speed to them all and their undertaking.

Other toasts followed, and the proceedings terminated with thanks to the chair, etc., etc.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.—ASSISTANTS' SECTION.

The first annual supper of the Assistants' Section of the Glasgow Chemists and Druggists' Association was held in the Regent Hotel, 221 Sauchiehall Street, on Wednesday evening, Feb. 6, at 8.30 p.m. Mr. W. Simpson, President, occupied the chair, supported by Dr. Nairne, Messrs. Pettigrew and Walker, and Messrs. Young, McLaren and Welsh, a deputation from the Edinburgh Chemists' Assistants' Association, Messrs. McMillan and Taylor acting as croupiers. About fifty sat down to an excellent supper, after which the chairman gave the usual loyal and patriotic toasts, which were heartilly responded to.

In proposing "Success to our Annual Gathering" he (the chairman) expressed his regret at seeing such a small number of assistants present, and said he thought the Association deserved better support from them seeing the good they derived from it. He alluded to the attempt to get a reduction of the Sunday hours last session, and thought the assistants had themselves entirely to blame for the failure. He commented in severe terms upon a number of druggists and doctors who, rivalling hucksters' shops, kept their shops open all day, more for the sale of "sweeties" and cigars than medicines.

Mr. Walker, in proposing the medical profession, said he thought pharmacy was greatly indebted to scientific medical men, as the majority of new pharmaceutical preparations were introduced by them. Alluding to the relations between doctors and druggists he thought doctors had as good a right to keep open shop as druggists had to keep branch ones without a qualified assistant in charge; in fact keeping open shop was the only way in which a young medical man could bring himself prominently before the public and into a practice in a town such as Glasgow.

Dr. Nairne in reply congratulated the Chemists and Druggists' Association on the advance they were making towards a reasonable separation between their own business and the profession of medicine. In Glasgow young medical men who were determined to get a city practice felt themselves compelled to keep an open shop, where they gave advice gratis and charged, ostensibly, for the medicine supplied in order to make a livelihood: that is to say they practically became druggists, till patients were sufficiently numerous to satisfy their wants. There were various reasons for this state of matters, all of which he hoped soon to see amended, and while medical men might yet be taught, even more extensively than they were at present, the practice of pharmacy, they would find it greatly to their advantage and to the interests of their patients to leave this kind of work in the future wholly in the hands of the true pharmacists.

Mr. McMillan in proposing "The Pharmaceutical Society," said that in every gathering of pharmacists throughout the civilized world the mention of the British Pharmaceutical Society could not fail to meet with a hearty and respectful reception. In spite of opposition and lukewarmness the Society slowly but steadily carried out the aims and aspirations of its illustrious founders. The Council of the Pharmaceutical Society had a great deal to contend with in the carrying out of the Pharmacy Act; and it appeared to him that, at the present moment, quite as much depended upon themselves as local societies, and as individuals, as upon the Council in the working of it. Scientific training could do a great deal, but it required to be supplemented by other kinds of knowledge, by other branches of learning, before the chemist and druggist could take that position in the public estimation to which the importance of his business justly entitled him.

Mr. J. Bardsley replied.

Mr. Taylor, in proposing "The Edinburgh Chemists' Assistants' Association," said that from the fact of its being newly formed, he could not say much about it; but from the energy and spirit which was characteristic of all the Edinburgh assistants, he was sure the success to which it was so justly entitled was not far distant. The only thing in which they were behind Glasgow now, was the hours of business. He believed it was the boast of the assistants of Glasgow that they had far shorter hours than their Edinburgh brethren. He failed, however, to see it, as a paragraph appeared in one of the daily papers advertising "an always open pharmacy," and it was quite a common thing to see shops open at 9.30, ay, even 10 p.m.

Mr. Young, in reply, expressed the pleasure he felt in being present as one of the representatives of their newly-formed Association. He spoke of the letter which appeared in the *Pharmaceutical Journal* (February 2nd), suggesting the formation of an assistants' section of the Pharmaceutical Society. He thought it deserved the consideration of assistants generally, not in the light of a trades' union society, but as a benefit society, whereby a young man out of a situation (through circumstances over which he had no control) might receive assistance if he required it. He could say very little regarding the Edinburgh Assistants' Association, only that it was formed, and by next session it was hoped to have it in full working order.

The other toasts were "The Strangers," by Mr. Paris. "The Committee," by Mr. Fenwick, "The Chairman," by Mr. Welsh, and "The Croupiers," by Mr. Pettigrew.

During the evening the company were greatly enlivened by songs and recitations, in which Messrs. Law, Macfarlane, Bruce, Taylor, Blain, and other gentlemen took part.

Proceedings of Scientific Societies.

UNIVERSITY OF EDINBURGH CHEMICAL SOCIETY.

The fifth meeting of the Edinburgh University Chemical Society was held on 20th February, John Gibson, Ph.D., F.R.S.E., presiding.

Mr. W. L. Goodwin read a paper on "A Method of Removal of Iron from Cupric Sulphate for Analytical Purposes," in which he stated that this could be performed by the replacement of the iron by cupric hydrate.

Mr. Alexander Macfarlane, M.A., B.Sc., read a paper on "The Disruptive Discharge of Electricity" in which he gave the difference of potential energy necessary to produce sparks at different distances, and also with different pressures, and gases as dielectrics.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, February 21st; Dr. Gladstone, President, in the chair.

After the announcement of visitors, reading of minutes, etc., the following certificates were read for the first time:—T. H. Norton and J. Tchermiac. The following gentlemen were elected Fellows:—L. T. Wright, W. Hudson, T. Lichtenstein, G. S. Johnson, and W. B. Lowe.

It was then announced from the chair that the following would retire:—From the office of Vice-President, Dr. Gilbert and Dr. Stenhouse; from the Council, Dr. Attfield and Messrs. Phillips, Tuson, and Thomas Hyde Hills. The names proposed to fill the above vacancies were, as Vice-Presidents, Professor N. S. Maskelyne and Dr. Angus Smith; as members of the Council, Dr. Tilden and Messrs. Riley, Warington and Carteighe.

The President then called upon Mr. J. Y. Buchanan to deliver his lecture—

Laboratory Experiences on board the "Challenger." Mr. Buchanan commenced by describing to the Society his laboratory. It was ten feet long, five feet eight inches broad, and six feet high, and although the dimensions seemed small there was practically quite room enough for one worker. The laboratory was situated in the middle of the ship, on the main deck, on the starboard; *i. e.*, the right hand side looking forward. A locker, two feet six inches high, and two feet broad, ran across the whole of the front side of the laboratory. Supposing that the visitor takes his seat on this locker looking aft the following description will convey a rough idea of the interior:—Immediately on his left is a gun port, which, in the absence of the gun, provides light and ventilation for the room; some light is also obtained from windows in the deck. The locker contains the stores of glass and porcelain, a balance, microscopes, etc. On the right is the blowpipe table, a spirit lamp formed of a wide-mouth stoppered bottle and having a large wick, was found to yield the most convenient flame. A tallow lamp was abandoned on account of the trouble of melting the tallow. On the left hand side further aft, is seen the principal working bench, three feet ten inches high, furnished with drawers containing the reagents, each bottle in a separate compartment. On the top of the bench battens are nailed, so that the bench presents the appearance of the frame of an ordinary door without the panels. Into the places where the panels should be the drawers of reagents can be fitted while in use, and so are prevented from shaking down. Ordinary retort stands were found to be useless, and the following stands were used: a half-inch metal rod was taken, and a long eye cut out at one end (like a needle: into this eye was fitted a staple driven into the joists forming the roof of the laboratory. By this arrangement the retort rod had a certain play up and down. The retort rings having been slipped on from the bottom, the rod was lifted, and then pushed down into a hole made for the purpose in the teak bench. This plan was found very convenient; when not in use the rods were turned up, the eyes forming the pivot, and hooked along the roof. For evaporating, drying, etc., a cast-iron frame set in gimbals and fixed to the side of the laboratory, was found quite sufficient even during the most violent movements of the ship. In the further left-hand corner are the sink and the distilled water vessel. Along the further end are wooden shelves with holes for various pieces of glass apparatus. Many vessels, etc., were slung from and between the beams supporting the deck. On the right-hand side are seen the bottles of standard solutions with burettes; the latter were made like pipettes, and filled by sucking up the solutions from below; in this way barium hydrate solution was found to keep its titre for two to three months, though used every day. On the same side the specific gravity apparatus, hydrometers and piezometers were stowed away. The lecturer stated that in all ordinary weathers, and in fact as long as the port, which lighted and ventilated his laboratory, could be kept open he found no difficulty in working on board ship.

Mr. Buchanan then proceeded to explain the various investigations he had carried out as to the compressibility of distilled and sea water, mercury, glass, etc. Before starting it seemed to him very desirable to have some means of checking the depths as indicated by the sounding line, and it was clear that some sort of barometric method must be used. Air had already been tried without success, and so water was finally adopted. The piezometer used consisted of a thermometer, the bulb having a capacity of about 9 c.c., the stem being thirteen inches long, and 1 mm. in diameter. The thermometer was inverted, after filling with water, in a little flask filled with mercury, the neck of the flask is connected to the stem by a short piece of india-rubber tubing, between which and the stem a piece of glass rod is inserted, so as to admit the external pressure to the surface of the mercury. By warming the bulb enough water is forced out to allow the mercury, on cooling the apparatus, to rise to a convenient height in the stem. In the stem is a little index similar to those used in Six's thermometer. The stem is divided into millimetres, and was carefully calibrated. If such an instrument be sunk with a sounding line it is clear that the water will be compressed, and that the mercury with the index will rise, such rise being the sum of the decrease in temperature and the increase of pressure. If a thermometer properly protected be sunk at the same time the temperature will be registered, and thus the increase of pressure can be found. Before starting it was thought that a gauge similar to those used with hydraulic pumps might be employed to determine the pressure, but on examination the gauge furnished was found unreliable, and after all, the length of the sounding line furnished the best gauge of the pressure, provided that care was taken that no currents, bad weather, etc., interfered with the result. If there is a current its existence is always rendered evident by the behaviour of the sounding line, as it goes up and down, so that practically there is no difficulty in saying when a sounding is good. The lecturer experienced some difficulty with the springs of the indices, and it was only on his way home, between Tahiti and Valparaiso, in a depth of 2000–2500 fathoms that he was able to get satisfactory results as to the compressibility of water. As a mean the compressibility of distilled water per 100 fathoms was found to be 0·0009, or per atmosphere, 0·000049; Regnault finding 0·0000486. The results at various depths agreed well; thus at 1000 fathoms 0·0008 at 2000, 0·0009; at 3000, 0·0008. The compressibility of sea water was determined in precisely the same instrument, and was found to be at 800 fathoms, 0·00077; at 1000, 0·00078; at 1500, 0·00073 per 100 fathoms. These experiments were all made by attaching the piezometer to the sounding line, the temperature being from 1° to 3° C. In order to determine the compressibility at higher temperatures recourse was had to a hydraulic instrument; but as no reliable gauge was at hand the only results possible were comparative; between sea-water and distilled water, at 26·5° C., distilled water = 100, 93·6, 25·8°: 92·0: 22·1°, 92·8: 22·5°, 92·0: 13·7, 92·6. A solution containing 4 per cent. sodium chloride, gave results, (distilled water = 100): 26·5°, 90·51 : 25·8°, 88·13 : 22·1°, 86·61: 13·7°, 86·84. The compressibility of mercury was next determined, and found to be, per 100 fathoms, 0·0000271, and per atmosphere, 0·0000015. The apparent compresibilities of water and mercury having been thus determined, the next task was the practical one of applying the results to control the soundings as obtained by the line, and the temperatures as indicated by the thermometer. Two piezometers, one charged with water, the other with mercury, were sent down on the sounding line. Now water is very sensitive to changes of pressure, but not to changes of temperature. Mercury, on the other hand, is less affected by changes of pressure, but considerably more by variations in temperature. The true temperature and true depth were obtained from the readings of the two instruments, thus: the rough depth as given by the sounding line is applied to correct the temperature as indicated by the mercury piezometer; by this temperature the reading of the water instrument is corrected, and thus the correct depth is obtained to within twenty-five fathoms. This is again applied to the mercurial instrument, and so by correcting backwards and forwards both the correct depth and the correct temperature are found. For great depths the piezometer above described is useless, a pressure above 3000 fathoms forcing the mercury into the bulb. To obviate this difficulty a bulb was blown in the middle of the stem, and its size was so arranged that the contraction up to 1500 fathoms was covered by this bulb, and so the stem was left to indicate greater pressures. The lecturer had endeavoured to measure the compressibility of glass, but for want of accurate measuring apparatus good results have not yet been obtained. The apparatus consists of a glass tube in which is a glass rod, slightly shorter than the tube, an index is brought down on to the rod; when exposed to pressure the glass tube contracts, the rod, however, maintains its length, and as a consequence the index is pushed up, and thus the amount of contraction is determined.

The lecturer then described the apparatus by means of which the amounts of oxygen and nitrogen in sea-water were estimated. About 900–1000 c.c. were used. The sample was collected in a brass cylinder furnished with stopcocks having a three-quarter-inch bore and was transferred to the flask in which it was to be boiled with as little disturbance as possible. To the flask is fitted an india-rubber cork, through which a glass tube, having a large bulb attached to it, passes; the tube and bulb are filled with distilled water, the end of the tube in the flask being closed by a simple device. The bulb is now boiled for ten minutes and the upper end of the tube closed. The lower end is now connected with the water in the flask and the latter boiled for one and a half to two hours. The gases evolved are collected in the bulb and analysed. The carbonic acid was determined by distilling about one quarter of a litre of water to dryness after the addition of 15 c.c. of barium chloride solution to prevent bumping. The steam was passed through a still and the distillate with evolved gases collected in flasks and tubes containing standard baryta water. This by titration with hydrochloric acid, rosolic acid being used as an indicator, gave the amount of carbonic acid. The following are the results of the analyses of about one-third of the gas samples obtained:—Oxygen + nitrogen = 100. In surface water, O = 33·67 at 25 fathoms 33·4 50 f. 32·3 100 f. 30·2 200 f. 23·4 300 f. 11·4 400 f. 15·5 800 f. 22·6 below 800 f. 23·5. So that from the surface downwards the oxygen decreases to 300 fathoms; below this depth it increases in amount. This increase is in all probability due to the decreasing amount of animal life at depths greater than 300 fathoms. Experiments with the tow net at various depths confirmed this view. As regards superficial distribution, the cold water at the Antarctic regions, both at the surface and below, is thoroughly aerated, the gases diminishing in quantity as we approach the equator, increasing again as we proceed northwards. From many experiments it was found that the absorption of nitrogen by sea-water varies considerably from that by distilled water, especially at high temperatures. The lecturer then pointed out the distribution of sea water as regards density in depth and superficially with the aid of several diagrams. Two regions of maximum density exist north and south of the equator, the north maximum being 25° north of the equator, the south about 15° south; towards the equator the density at the surface falls off, whilst towards the Arctic and Antarctic regions the density decreases rapidly. These regions of maxima correspond to the regions frequented by the trade winds. It is known that the south trade blows much nearer the equator than the north, and so the maximum of density is nearer the equator on the south. As to vertical distribution, the maximum penetrates some depth, but at 350 fathoms a great tract of water of low density is found. At the equator we find, first an increase as we go down, then a decrease, and last of all again an increase of density near the bottom. The densest water is found in the Atlantic. In the Pacific a certain imitation of the areas of dense water just described is found. Near ice very light water is found; again, near Hong Kong, just after the monsoons, the superficial water is very light, but during the dry season the water becomes more dense. The maxima of density lie in the north hemisphere to the S.W., in the south to the N.W. of the maxima of barometric pressure. It is at these latter spots that the cold dry winds descend from great altitudes and flow outwards, taking up moisture from the sea in their course and not becoming saturated until they are near the equator.

The President said that the very best thanks of the Society were due to Mr. Buchanan for the very careful lecture just delivered. He had invited them first into his small but compact laboratory, and explained the ingenious methods for determining various physical questions. He had then detailed the more distinctly chemical results, of great interest, as to the distribution of gases and especially as to the diminution of oxygen above and below 300 fathoms, with respect to which he would like to ask whether this always held good for 300 fathoms, whatever the total depth might be.

Mr. W. L. Carpenter had listened with great interest to the lecture, especially as he had performed the same sort of work on board H.M.S. Porcupine. His laboratory was much smaller, the naturalist and himself having a table only four feet square between them. He was glad to hear that Mr. Buchanan's extended experience confirmed in several respects the results which he had arrived at. He would like to ask why the carbonic acid had been separately determined? whether an increase in the quantity of oxygen had been observed during rough weather in the surface water? whether any effervescence had been seen in water brought up from great depths? and whether any chlorine estimations had been made in relation with the specific gravity determinations?

Mr. Warington asked if any determinations of ammonia and nitric acid had been carried out with reference to the theory that the trade winds came to our shores rich in ammonia while our soils lost nitric acid to the rivers, etc.

Mr. Buchanan replied that the depth of 300 fathoms was irrespective of the total depth; that the carbonic acid was determined separately because it had been shown that it could not be driven out of sea water by boiling *in vacuo* satisfactorily. In one case of cold water brought up near the river La Plata he had seen effervescence resembling that of natural seltzer water, but from want of time he had not made any number of chlorine, nitric acid, or ammonia determinations.

A hearty and unanimous vote of thanks was then given to Mr. Buchanan for his interesting lecture, and the Society adjourned to March 7, when the following papers will be read:—"On the Action of Ammonia on Anthrapurpurin," and "On Some New Derivatives of Anisoïl," by Mr. W. H. Perkin.

Parliamentary and Law Proceedings.

Methylated Finish.—Excise Prosecution.

At the Worship Street Police Court, Mr. Thomas Sanders, chemist and druggist, of Abney Park Terrace, Stoke Newington, appeared to a summons charging him with having sold methylated spirits without being licensed. —An inspector proved that on the 8th of November he purchased at the defendant's shop half a pint of spirits, which purported to be "methylated finish," but which on analysis at the laboratory, Somerset House, was found to contain less than the required amount of gum. A gallon of methylated spirit to be sold as finish, for which no licence was necessary, was required to contain 3oz. of gum, and the contention for the defendant was that if in the portion analysed there was less than the proper amount of gum, it was the result of accident.—The defendant, who conducted his own case, submitted that the analysis should have been conducted by troy weight and not avoirdupois, as had been the case, as then the proportion would have been correct. The admixture, he said, was made not merely for the trade of polishers and cabinet makers, but to prevent methylated spirit being drunk, as was at one time customary in the North of England. The defendant complained of the time the authorities had allowed to elapse before taking proceedings, and added that he had purchased methylated finish of the manufacturers, and sold it as it was supplied to him.—Mr. Bushby decided against the defendant, and ordered him to pay the minimum fine of £12 10*s.*—*Standard.*

Dispensing Memoranda.

We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be considered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.

[54]. Creasote Pills. The discussion with reference to creasote pills has arisen from a request in the dispensing memoranda for information how best to dispense pills containing each two minims of creasote and two minims of compound rhubarb pill. Referring to these pills in the month's summary the writer suggested that half a grain of calcined magnesia should be added to each minim of creasote prior to its being mixed with the compound rhubarb pill.

Mr. Martindale objected to the addition of calcined magnesia stating as a reason that it renders creasote pills "hard and insoluble as marbles." I replied to this by quoting the results of some experiments tending to prove that his extreme views on this subject must be in great part erroneous. In his reply he states that the remarks in his former letter refer to pills made of creasote with calcined magnesia alone. It would have been better if he had definitely stated this at the time, as, from the first, one formula only for the "creasote pills" has been under consideration; however, he adds that the pills would be about as inert as regards the creasote even with the addition of compound rhubarb pill.

The experiments on the solubility of these pills, detailed in my former letter, go far to disprove the statements in the first and third paragraphs of Mr. Martindale's last letter. Professor Redwood's three fundamental rules governing the choice of excipients may be accepted as safe truisms, but they throw no additional light on the subject in dispute.

The fourth paragraph commences "hyperbolically." Referring to this word in the dictionary, I find that hyperbola is "a figure of speech which expresses much more or less than the truth." It might be considered fortunate for its readers that the *Pharmaceutical Journal* does not deal much in hyperbole. If the paragraph were not hyperbolic, I would ask for some authority for the statement, or some facts to prove that there is just as great a difference between the action of creasote and creasote in its combination with magnesia as there is between sulphuric acid and epsom salts.

In the last paragraph Mr. Martindale states that "caustic alkalies decompose creasote." The combination which takes place does not imply decomposition in the ordinary acceptation of the term. Pereira, in giving the details of the process for the preparation of creasote, states, "it is mixed with strong solution of potash, which combines with the creasote, the alkaline solution is then neutralized by sulphuric acid and the oil separates;" "this treatment with potash followed by neutralization and distillation requires to be frequently repeated." Miller says "the heavier oil is then treated with solution of caustic potash; by this means the creasote is dissolved, when cold dilute sulphuric acid in slight excess is added to the liquid and the creasote set at liberty." "Creasote combines with potash, and forms with it a crystalline compound."

From my experiments already detailed it will be seen that the creasote pill made as suggested readily disintegrates when placed in lukewarm water, with the development of a strong creasotic odour,—the creasote therefore as a medicinal agent cannot be inert in these pills; also that the acid existing in the stomach is capable of combining with the magnesia and liberating the creasote previously combined with it may, I think, be fairly accepted from the results obtained in the said experiments and under conditions somewhat analogous to those which exist in the stomach.

My remarks throughout apply to the original combination the subject of the inquiry, two minums of creasote with two grains of compound rhubarb pill in each pill.

I send you by this day's post a specimen of the pills.

PIL. CREASOTI.

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[64]. In reply to the query as to whether drops or minims should be used in the following mixture, I answer minims, as drops are of very uncertain size, in a great measure depending upon the shape of the lip of the bottle in which the acid. hydrocyan. dil. is kept, etc.:—

℞	Aq. Laurocerasi	℥ij.
	Vini Ipecac.	℥j.
	Chlorodyne	℥ij.
	Acid. Hydrocyan. dil. . . .	gtt. xx.
	Aquæ	ad ℥viij.

In fact, I think that whenever guttæ are prescribed minims should be, and invariably are used.

Collis Browne's chlorodyne I think should be used, as it is the best known, and sanctioned by medical men of the greatest repute.

C. E. P.

[64]. In answer to query No. 64 in the "Dispensing Memoranda" of last week's Journal, I certainly think that when "blue pill" is prescribed, "blue pill" should be used, and that it would be an unpardonable substitution to use hydrarg. c. creta, seeing that they are not chemically alike, hyd. c. creta containing two-thirds its weight of prepared chalk, and blue pill none.

When blue pill is prescribed with a soft extract I usually use the extract in the form of powder.

C. E. P.

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[66]. Necessarily there is no separation in this mixture. I made it last Saturday, and it has stood until to-day (Tuesday) without the slightest signs of any separation.

I dispensed it as written, with the exception of adding the spt. æther. chlor. last. I should suggest that the separation which occurred in the mixture, as made by E. A. T., was due to one or more of the preparations used not having been prepared strictly according to the B. P. formula.

C. E. P.

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[69]. In dispensing the following—

Pot. Iodid.		80 gr.
Mucilag.		℥ss.
Spt. Æther. Nit.		ʒss.
Aquæ	ad	℥ij.

When pot. iodid. is prescribed with spt. æther. nit., the spt. æther. nit., which is generally acid, should be first neutralized with carbonate of potassium, otherwise a portion of the iodine will be liberated from the iodide of potassium, and give the mixture a brown colour, more or less deep, according as the spt. æther. nit. was more or less acid. This liberation of iodine is completely prevented if the spt. æther. nit. be neutralized before using. I dispensed the prescription as follows:—

Put a quantity of powdered acaciæ equivalent to the ℥ss of mucilage ordered into a mortar, add ℥j of aqua and stir until a mucilage is formed; in this dissolve the potassium iodide, then add gradually the neutralized spt. æther. nit. with constant stirring, pour into the bottle and fill up with aqua. The mixture thus prepared has a whitish opaque appearance.

C. E. P.

Scarborough.

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[69]. This can be made a perfectly clear mixture by dissolving the pot. iodid. in the water, then the mucilage, and shaking, then gradually adding the sp. æth. nit., shaking the bottle after each addition, letting it stand a short time until effervescence ceases.

E. J. EATON.

Lowestoft.

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[71]. Last week I had to dispense the following prescription, which is a similar one to that referred to by "Ignoramus:"—

℞	Zinci Oxyd.		℥j.
	Ung. Cetac.		℥vij.
	Aq. Rosæ		
	Glycerin.	āā	℥j.

Ft. ung.

The following is the mode of procedure I adopted. First, melt the ung. cetac. to a creamy consistence, next add the aq. rosæ and glycerine (previously mixed), and stir well together. Lastly, add the zinci oxyd. well pulverized, and stir until cold.

The above method yields a very good ointment, and upon experiment I find that "Ignoramus" would be able to dispense his prescription in a similar manner to the above.

E. A. HANSON.

Leeds.

[72]. How should pills, as per prescription, be made? I put ♏v ol. carui, and used gly. tragac. as excipient. The pills were soft, and my customers complained of their being larger than those obtained from the first maker.

℞ Calomelas . . . . gr. iv
Pulv. Doveri . . . . ℈ij
Bismuth. Trisnit. . . . . ℈ij
Ol. Carui . . . . q.s.
Ft. mass et divide in pil. xxiv.

R. TURNER.

5, Chippenham Terrace, Harow Road, W.

[73]. Will some one kindly inform me through medium of the Journal how the following should be dispensed?—

Pharm. Brit. 1867.

℞ Ferri Carbonatis . . . . ʒij
Rhei Pulveris . . . . ʒij
Spiritus Chloroformi . . . . . . ʒss
Aquæ Destillatæ . . . . . . ad ℥x
Misce.

TOM.

Cannock.

[74]. A prescription, of which enclosed is a verbatim copy, was brought to me to be dispensed by an old customer of ours. I should be glad if any reader of the Journal will inform me through its columns how he would have dispensed it.

℞ Tinct. Nucis Vom. . . . . ʒiss
Pepsinæ Porci. . . . . ʒiv
Acid. Nitromur. Dil . . . . ʒiij
Acid. Hydrocyanic. . . . . ʒiss
Liquor. Bismuthi . . . . ℥ij
M. Ft. mist.

Two tablespoonfuls to be taken three times a day immediately after meals. J. W. M. C.

Colombo, Ceylon. G. A. WATKINS.

[75]. I should be glad to know the best excipient to use in making the following pills:—

Bals. Peruv. . . . . ʒj.
Myrrh. Pulv. . . . . ℈ij.
Assafœtidæ,
Galbani . . . . āā ℈j.
Pulv. Capsici. . . . . gr. xv.
M. ft. pil. xxx.

Plymouth. C. T. WEARY.

Notes and Queries.

[578]. WRITING INK.—The *Bunzlauer Pharm. Zeitung* gives the following prescription:—

Take 7lbs. of logwood and 2lbs. of galls in coarse powder, and boil them with 60 pints of water for two hours. In the strained and cooled decoction dissolve 4 lbs. sulphate of iron, add 6 ounces, by weight, of strong solution of perchloride of iron and after having exposed the liquor to the air in an open vessel for ten hours, add finally 2 ounces, by weight, of acetic acid and gum acacia quantum satis.

HUGO W. LANGBECK.

Obituary.

Notice has been received of the deaths of the following:—

On the 1st of February, 1878, Mr. John Harvey, Chemist and Druggist, Newark. Aged 57 years.

On the 18th of February, 1878, Mr. Thomas Cook, Chemist and Druggist, Northgate Street, Gloucester, Aged 65 years.

On the 23rd of February, 1878, Mr. Thomas Colton, Pharmaceutical Chemist, Ousegate, Selby, Yorks. Aged 72 years. Mr. Coulton had been a Member of the Pharmaceutical Society since 1852.

On the 24th of February, 1878, Mr. Samuel Lacey, Chemist and Druggist, Vassall Road, Brixton. Aged 35 years. Mr. Lacey had been a Member of the Pharmaceutical Society since 1875.

Review.

PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION AT THE TWENTY-FIFTH ANNUAL MEETING Philadelphia: Sherman and Co. 1878.

The Proceedings of the American Pharmaceutical Association for 1877 follows closely upon the heels of its English brother. The volume, as usual, commences with a number of reports, including that on the progress of pharmacy, which corresponds to the English Year-Book. Then follow the papers read during the meeting of the Association at Toronto, and after these the discussions respecting them.

Some of the reports contain very interesting information; for instance, that on the Drug Market includes an account of the collecting of Canada balsam, well worth reading. It will be remembered that the last meeting of the Association was held at Toronto, consequently many of the statements have a special bearing on Canadian circumstances. It appears that a portion of the trade in crude drugs that were formerly imported entirely from Europe has recently been diverted to New York. But the great bulk of Canada's supply of chemicals still comes from Great Britain, and it is admitted that the "prejudice" among physicians and druggists is strongly in favour of British goods. In fact, the reporter states, that it is doubtful if an ounce of quinine of United States' manufacture is to be found in half a dozen stores in the province. Under these circumstances it is not surprising to notice that a member has proposed to extend the influence of the Association—so far as this can be done by pen and ink—by declaring one of its objects to be "to unite the educated and reputable pharmaceutists of *America*," instead of the "United States" as heretofore.

The volume is only about two-thirds of the size of that for the previous year, but it constitutes a valuable addition to pharmaceutical literature.

A TREATISE ON THE MANUFACTURE OF PERFUMES AND KINDRED TOILET ARTICLES. By JOHN H. SNIVELEY, Ph.D., Nashville: C. W. Smith; London: Trübner and Co. 1877.

Until within the last few years, works on perfumery were scarce, and those which have hitherto appeared in this country, although affording very interesting reading, and giving processes mostly adapted for business on the large scale, were comparatively useless to the retail chemist and perfumer. The art of mixing perfumes satisfactorily is one which is only attained after considerable personal experience, and by long and continued training of the olfactory organ; hence good formulæ are of enhanced value to those who have no means of acquiring experience in the art, and for the same reason are generally kept as secret as possible.

Professor Snively's work is one, however, which bears the impress of the author's familiar acquaintance with the subject of which he treats, and will, we think, meet the wants of the retail chemist better than any book of the kind which has yet appeared in this country. How far this is owing to the work being published by an apothecary, it is impossible to say; but it is very certain that many of the formulæ are exceedingly good.

The first thirteen pages of the book are devoted to introductory matter; the various processes used on a large scale, such as enfleurage, distillation, etc., being briefly glanced at.

Then follow about eighty pages devoted to the crude materials used in perfumery, and the remainder of the book (more than one hundred pages) is taken up with formulæ for perfumes, sachets, pastiles, cosmetics, hair washes, hair dyes, dentifrices, etc.

In the portion in which the crude materials are described, a figure of the plant, etc., from which it is derived, the amount of essential oil it yields, and the uses to which it is put are fully entered into, and useful practical hints are often given; thus with regard to quillai bark:—

"It is crushed without much difficulty, but the powder arising in the operation is exceedingly annoying to the operator, causing violent sneezing and much irritation of the throat and even affecting the eyes; hence it should be moistened and simply bruised when prepared for maceration."

Remarks of this description abound, and show that the author must have acquired practical experience of the need of them. No one who has attempted to powder quillai bark, preparatory to making hair-wash from it, will forget the unpleasantness of the task if he has not adopted the precaution recommended in the above note. The index reveals the American origin of the work, for while we find formulæ for Florida water, bay rum, and other essentially American productions, recipes for milk of elder flowers, areca nut, and cherry tooth paste, tincture of myrrh and borax, and a few other favourite compounds in daily request in this country, are conspicuous by their absence. In a few instances too, better methods of manipulation might have been mentioned, as under rose lip salve, liquid rouge, and pearl powder. No work, however, has ever yet been published in which there was no room for improvement, and trifling omissions of this kind are easily remedied in a second edition. Taken as a whole, the book is well and carefully written, and the retail chemist and perfumer in this country will probably find not only much in it that will be new to him, but many recipes which he will be able to turn to a good account.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Dental Practitioners' Bill.

Sir,—On the 13th inst, I wrote to Sir J. Lubbock, calling his attention to the fifth clause in the "Dental Practitioners' Bill." On the 21st inst. I received a reply from him. I enclose you copies of the correspondence which you are at liberty to publish, and which I think will be read with interest by those chemists practising dentistry.

There can be no doubt as regards our rights being protected by Sir J. Lubbock, and I think we may leave the matter in his hands with perfect confidence.

Thos. C. Maggs.

Yeovil, February, 23, 1878.

Copy.

"*Yeovil, February* 13, 1878.

"To Sir John Lubbock, M.P., D.C.L., F.G.S., etc.,
"35, Albemarle Street, London.

"Sir,—In the fifth clause of the Bill introduced by you to amend the law relating to dental practitioners, the words "either separately or in conjunction with the practice of medicine or surgery" have been supposed by some persons to imply a meaning so foreign from what I feel to be your intention, that I venture to address you on the subject.

"It is considered this might be interpreted as naming one of two classes of persons.

"1. Those who have practised dentistry and nothing else

"2. Those surgeons who have practised dentistry.

"This would leave out all others who added dentistry to a cognate art or profession, such for example as that of a legally qualified pharmaceutical chemist, while it would admit as qualified practitioners a mass, however ignorant, who had done nothing but draw teeth.

"The construction that I have heard put upon the clause, and which I think most agreeable to common sense and justice, is that all who have practised dentistry hitherto, whether in connection with surgery or not, are eligible.

"It would be a great satisfaction to pharmaceutical chemists practising dentistry to hear from you that the last interpretation expressed your views and intentions, and if you could honour me with a line to that effect I shall feel deeply obliged, and

"I have the honour to be
"Your obedient servant,
"Thos. C. Maggs."

Copy.

"*High Elms, February* 21, 1878.

"Sir,—I beg to acknowledge the receipt of your letter. My attention has been already directed to the point, and I am quite disposed to support such an amendment as you suggest.

"I am your obedient servant,
"John Lubbock.

"Thos. C. Maggs, Esq."

Sir,—Annexed I give you a copy of the reply by Sir John Lubbock, in answer to my letter to him of the 11th inst., suggesting that the words standing in the Bill "separately or in conjunction with the practice of medicine or surgery" should be amended thus, by adding the word pharmacy, "separately or in conjunction with the practice of medicine, surgery, or pharmacy."

His reply, I think, is highly satisfactory and will, I hope, lead to practical results.

Geo. Jas. Gostling.

Stowmarket, February 27, 1878.

Copy.

"*High Elms, February* 21, 1878.

"Sir,—I have duly received your letter in which there is much force. My attention has been already directed to the point, and I am quite disposed to support such an amendment as you suggest.

"I am your obedient servant,
"John Lubbock.

"Geo. Jas. Gostling, Esq."

Sir,—It is evidently intended by the expressed words of the "Dental Practitioners' Bill," that chemists who are now at this moment carrying on the practice of dentistry in connection with their own business or profession, should be entirely ignored, notwithstanding their right in common with others (who follow it separately) to the title dentist.

I would ask why the so-called dentist (without any diploma or qualifications) should be registered as a properly qualified dentist, according to the proposed Act, and the chemist who does possess in general some legal qualification, and who is equally efficient as a practical dentist, be excluded and not even allowed to register.

It would be very unjust if such a Bill were allowed to become law.

I sincerely trust this will not come to pass, and that may be safely predicted should the Pharmaceutical Society timely interfere in the matter by acting at once upon the suggestions which have been thrown out in your Journal.

W.

Burnley, February 21, 1878.

The Discrepancy of Examination Results.

Sir,—In reading over the report of the proceedings at the last meeting of Council, I feel considerably interested in the projected scheme of sending a deputation of Examiners from London to Edinburgh, and making a corresponding appointment of members of the Scottish Board to attend the examinations held in the metropolis.

While unwilling to trespass upon your space, I cannot refrain from expressing my firm convictions with regard to the cause of such a conspicuous want of uniformity in the results of the Minor and Major tests at the two places where they are conducted, a difference which seems to suggest to some minds the idea of unfairness on the part of the adjudicators.

I have often had to "assume the defensive" on behalf of the North British Branch, and assure the complainer of the strict impartiality, yet thorough sifting, manifested at both centres. The great outcry in England is to the effect that in Edinburgh the examiners are much more lenient than their southern brethren. Now the absurdity of such a rumour could only be paralleled by the assertion that when in one town, on a certain day, sixty per cent. of the candidates pass, while only half that number give satisfactory answers on the next, it may be inferred that either the questions put on the second day of meeting were twice as difficult, or else the examiners were in a crotchety mood.

I will venture to tender an explanation on the subject, though it may not allay the groundless suspicions of captious critics. In the first place I think Mr. Bottle is quite right in his surmise that the out-door situations (so general in Scotland), and consequent shorter hours of business, are more conducive to the maintenance of studious habits, than the long confinement to badly ventilated shops, followed up by restriction in the evenings which unfortunately is so customary in so many parts of England.

But I go further and say that the success of the "Canny Scot" is in great measure due to the indomitable perseverance and extreme caution, inherent in his nature, whereas the higher average of failures south of the border may be attributed to the lack of such a spirit, *i.e.*, the want of persistent application, the love of liberty, and a rather high estimate of ability, leading to premature attempts "to qualify."

However wise the adoption of Mr. Schacht's proposal may be, I consider it a one-sided investigation so long as the national traits of character are disregarded. While upholding the efficiency of either board and comparable degree of stringency, I do not doubt the possibility of attaining a still greater similarity, in fact a stereotyped system of dragging candidates through the ordeal, yet I fear the relative percentage of failures will vary but slightly from former results.

I do not say that the intellectual capacity of the Highlander is of a higher type than that marking the South Briton, although contrast of the form of cranial structure would indicate the prevalence of *Brachycephalæ* (short heads) north of the Tweed, while the long heads, *Doliocephalæ*, appear to predominate amongst the English people; and physiologists tell us that the former possess greater cerebral development than the latter. But "the race is not always to the swift nor the battle to the strong," so there is no reason why competitors from any part of this island should not equally distinguish themselves.

To remedy the evil, let masters be more considerate to their apprentices, allowing them opportunity for advancing in the pursuit of knowledge, so that with the motto "Slow but sure" (remembering the fable of the tortoise and the hare), they may push on with unflinching energy not only to pass through the "wicket gate," but steadily progress in the path they have chosen, culling flowers by the wayside, and reaping the harvest in the end.

In conclusion I may add that absolute uniformity can only be arrived at by abolishing the present system of oral examination and introducing printed papers and written answers (which may be checked by a second party), then all candidates would receive a fair test, and nervous individuals would stand the same chance as their less easily agitated fellows.

Newcastle-on-Tyne, Feb. 14, 1878. JAMES B. L. MACKAY.

THE PRELIMINARY EXAMINATION.

Sir,—Now that the question of the Preliminary examination has forced itself on the attention of the Council, I do trust that the matter in all its bearings will be carefully considered.

The large proportion of failures ever recurring in this department is becoming a serious affair, painful to the candidates themselves, to their parents and guardians, and last, not least, to their employers.

The question seems to resolve itself into two issues, either that the quality of the article examined is deteriorating, or, that the qualifying test is too stringent. Now, from all I can learn I do not think there is any falling off of the quality of the article, at least north of the Tweed. What the antecedents of the candidates are further south I leave for Mr. Schacht to determine. After some inquiry I find that for the last ten years at least, the chemists in Scotland are as careful as they can be to obtain proper, well-educated lads for apprentices. The metrical system I have no doubt is to blame for a great many of the failures, and this is a point where some latitude ought to be allowed in judging of the candidates, seeing that they have never, in a great number of instances, learned it at school, and on the day of trial they get bewildered with it. But why, it will be asked, were there so many failures at the last examination, when there were no metrical questions at all? I can only answer this on the supposition that the candidates had exhausted their powers preparing for the dreaded metrical, to the exclusion of the other questions. One point brought out at the discussion in the Council was that the middle-class education was defective, another was the nervousness of candidates, and a third was the remissness of superintendents. To give the question a practical turn, might I with all respect suggest the following?—

1. That four hours instead of three be the time for the examination.
2. That half a guinea only be exacted for each failure.
3. That in the event of the candidate's failing the first time, he should be informed what his weak point was.

These I consider modest demands on behalf of our young men, coming forward. Of course I throw them out like a ball set rolling, expecting a knock or two in the process. Something such as the foregoing, or a diminution in the number of points insisted on by the examining body would, I submit, be a boon to the candidates, while the "safety of the public" would not be interfered with.

I trust, Sir, that something will be done to allay the irritation, now almost getting chronic, in reference to this question, and that the result will be the framing of a new and equitable code of regulations for future guidance, which will satisfy the great body of the trade whether pharmaceutical chemists or chemists and druggists.

Stirling, February 13, 1878. WM. DUNCANSON.

[*** Our correspondent is under a misapprehension in supposing that the subject of the Preliminary examination has only now forced itself on the attention of the Council, or that it has not long since received careful consideration.

As regards the quality of what our correspondent designates "the article," there is another alternative which appears to have escaped him, viz., that its quality has been, and in many instances, still is, far below the requisite standard. Herein lies what we believe to be the true explanation of the many lamentable failures in an examination so simple as the Preliminary.—ED. PHARM. JOURN.]

V. A. W.—See Ure's Dictionary under "Acetic Acid."

Cera Alb.—Both the methods of carrying on business described would, in our opinion, be illegal. Should such proceedings be within your cognizance you are recommended to communicate full particulars to the Registrar.

A. P. S.—We believe there is no restriction on the practice of pharmacy in the colony at present.

"*Examination in Arts.*"—Apply to the Secretary, 17, Bloomsbury Square.

G. A. Watkins.—See an article on the Phosphate Syrups in the *Pharmaceutical Journal* for December 22 last, p. 481.

E. J. Wall.—Yes.

R. W.—Practically there is no difference.

J. W. J. T.—(1) Pepsine wine may be prepared by macerating pepsine in any wine suitable for the purpose. (2) No formula for the preparation has been published.

E. Kemp.—The specific gravity of bismuth is given as 9·83; that of thorium as 7·65.

W.—Not at present.

C. Collins.—The subject referred to in your letter shall have our attention.

W. S. Turnbull.—We know of no reason why the lotion described should produce a black stain upon linen.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Kay Bros., Mr. Campbell, Mr. Cox, Dr. Morel, Mr. Wade, Mr. Jackson, Mr. Stoakes, Mr. Haddock, Mr. Cleland, Mr. Wigner, Nil Desperandum, One who loves Justice.

CROTON OIL.*

BY HAROLD SENIER, F.C.S.

The late Mr. Warington in a paper published in the *Pharmaceutical Journal* (vol. vi., p. 382) gives a series of experiments from which he concludes that the solubility of croton oil in alcohol increases with the age of the oil or of the seeds prior to expression. Dr. Pereira had previously expressed a similar opinion, founded on experiments made by himself and also by Professor Redwood, as detailed in a paper published in the first series of the *Pharmaceutical Journal*, vol. ix., p. 499. I have recently been engaged in an investigation into the causes of these variations in solubility, and have a few observations to report which seem to be of interest.

In the first place, I examined the solubility of two samples of commercial oil, kindly furnished me by Mr. E. M. Holmes, one being about three months, and the other about three years old. These I afterwards supplemented by three other samples, one of which was expressed by myself. The mode of determining the solubility of the different samples was as follows:—10 cubic centimetres of oil were measured into a finely graduated hundred cubic centimetre measure, and 50 cubic centimetres of solvent added. The measure was then closed with a rubber stopper, the whole well agitated and allowed to stand until both the oil and the supernatant liquid became perfectly clear, and the line of demarcation well defined. This generally required from 12 to 24 hours, and then the reading was taken. This operation was repeated with fresh spirit until only an unappreciable amount of oil was dissolved on a fresh addition of the solvent.

My first experiments were made both with absolute alcohol and rectified spirit (specific gravity 0·838), the results of which showed that although absolute alcohol dissolved the soluble portion of the oil more readily than the rectified spirit, the final results were apparently the same. In all the succeeding experiments, therefore, rectified spirit was used, and it was found that to entirely separate the soluble portion from 3 to 5 agitations were necessary. The results of the examination of the five samples of oil before alluded to are given below in a tabular form.

No.	Age.	Percentage dissolved.
1.	Freshly expressed	20
2.	3 months	40
3.	3 years	55
4.	More than 3 years	60
5.	?	35

The above oils were all of British manufacture, and the experiments were made at a temperature of from 50° to 60° Fahr. These results tend to show that the solubility of croton oil in alcohol increases with increase of age, but none of the samples tried by me were found to be wholly and permanently soluble. In the experiments recorded by Dr. Pereira, it was found that all those samples of oil operated upon which had been expressed in this country dissolved in alcohol without subsequent separation at common temperature, and Mr. Warington describes one sample having that degree of solubility.

It is not, however, to these experiments that I wish to allude chiefly in this paper, but rather to some others to which they led. As a matter of curiosity I applied to my arm a small portion of the residual oil left after well washing with alcohol in one of the above experiments, and was surprised to find that it produced no effect whatever. I applied it in larger quantities with like result. I then evaporated, over a water-bath, the alcoholic solution of the oil and obtained a residue, which when applied to the skin was exceedingly active, giving evident signs of irritation in a few minutes, and in a few hours a distinct eruption. This experiment was repeated with each of the five samples above mentioned, and in every case the part soluble in spirit was found to be active, while that part insoluble in spirit was devoid of activity, that is, of the power of producing the characteristic eruption upon the skin.

By subjecting a larger portion of oil, No. 5, which is a commercial oil of guaranteed purity, to the solvent action of spirit, repeated until no more was dissolved, evaporating the supernatant alcoholic solution at 212° Fahr., and drying the residual oil at the same temperature, I obtained the part soluble in rectified spirit. This is a viscid oil at ordinary temperatures, of a reddish-brown colour with a slight fluorescence and the strong characteristic odour of croton oil. It is turbid owing to the suspension of a quantity of acicular crystals which are soluble on slightly warming the oil. At a temperature of 50° Fahr. the oil is too viscid to flow, and at 32° Fahr. it becomes of the consistence of butter. At 60° Fahr. it has a specific gravity of ·987. The oil insoluble in rectified spirit is at ordinary temperatures of a light yellowish colour, not fluorescent, having a very slight odour, quite clear, and begins to thicken only at a temperature of 16° above zero, Fahr. It has a specific gravity of ·924 at 60° Fahr. The oil soluble in alcohol when heated to 460° Fahr. by itself, and to 360° Fahr. with hydrochloric acid, and to the same temperature with a strong solution of potassium hydrate, does not appear to lose any of its activity; therefore the active principle is probably not volatile.

From the above experiments it may reasonably be concluded that for medicinal and pharmaceutical purposes an oil extracted by alcohol would be a more satisfactory preparation than the crude oil.

Whether the factor of age increases the gross activity of the oil, as it increases the soluble portion, I have as yet been unable to determine, but investigations upon this and other points are still in progress.

[*The discussion on this paper is printed at p.* 718.]

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, March 6, 1878.

DUBOISIA MYOPOROIDES, *R. Br.**

BY E. M. HOLMES, F.L.S.,

Curator of the Museum of the Pharmaceutical Society.

Some specimens of this plant having recently been presented to the herbarium by Dr. J. Bancroft, of Brisbane, an opportunity occurs of laying before the Society such particulars concerning the plant as can be readily obtained.

The duboisia is a small tree or tall shrub, about twenty feet in height, with long slender erect branches, arising from the stem at an acute angle, the leaves generally covering only the tops of the branches, so

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, March 6, 1878.

that except at the summit the woody portion of the tree is rather bare.

The leaves are alternate, shortly stalked, quite smooth, and entire, lanceolate in shape, from three to four inches long, and about one inch broad in the middle. The flowers, which are pale lilac or white, and very small, are arranged in terminal panicled cymes. The corolla is regular, bell-shaped, erect, and only two lines long. The stamens are didynamous, with the rudiment of a fifth one, and the fruit is small, succulent, and berry-like. From the above description it will be seen that the plant appears to be nearly allied to the *Scrophulariaceæ*, on account of its didynamous stamens, while in the regular corolla it approaches to the *Solanaceæ*. Accordingly, botanists have been somewhat puzzled as to which family it naturally belongs. Together with *Anthocercis*, *Petunia*, and several other genera forming the natural group *Salpiglossidæ*, it was, by several botanists, formerly placed in the *Scrophulariaceæ*, but has now found a resting place among the *Solanaceæ*. This view of its natural position receives confirmation from the fact that the properties of several of the plants of the group, such as *Anthocercis viscosa* and *Duboisia myoporoides*, have recently been found to possess properties similar to those of belladonna. The reniform seeds, with a wrinkled and pitted testa, also resemble those of many of the *Solanaceæ*.

Of the genus *Duboisia* the plant now under consideration is the only one known with certainty, although Baron von Mueller considers that two other plants, which he has provisionally named *D. Hopwoodii* and *D. Leichardtii*, should be placed in the same genus. Until the fruit of these plants is discovered, it is not certain whether they should be referred to *Anthocercis* or *Duboisia*, the former genus having capsular and the latter a baccate fruit.

Duboisia myoporoides is a native of Australia, occurring in various localities from near Sydney to near Cape York. It has been found also in New Caledonia, and more recently, by Baron von Mueller, in New Guinea also.

About Brisbane it grows plentifully on the borders of vine scrubs, and springs up after the forest of timber has been burnt off.

The history of the discovery of the properties of duboisia is somewhat interesting. Dr. J. Bancroft had been investigating the botanical source of pituri, and sent some leaves to Baron Mueller, who identified them with his *Duboisia Hopwoodii* and suggested that Dr. Bancroft should try the properties of *Duboisia myoporoides*, stating that in his opinion the leaves of that plant would be found to possess properties similar to those of stramonium. Dr. Bancroft followed out the suggestion, and tried an extract of the leaves upon some of his domestic animals. He found that the pupil of the eye became widely dilated, and that cats and dogs when under its influence walked about as if blind and helpless, falling over the least irregularity of surface, but that if let alone they would go to sleep. He then tried it on human beings in ophthalmic cases, and found its action both powerful and rapid in dilating the pupil of the eye. The extract appears to be almost equal to atropine in strength and is now used instead of that alkaloid both at Brisbane and Sydney. The aqueous extract is the preparation which has hitherto been used, the active principle not having been isolated. There is, however, every probability that it will be found to be an alkaloid similar to, if not identical with, atropine The properties of the extract have lately been examined by Dr. Ringer and Mr. Tweedy, and an account of their experiments appeared in the *Lancet* for March 2.

Dr. Ringer finds that besides dilating the pupil of the eye, it dries the mouth, arrests the secretions of the skin, and produces headache and drowsiness; it also increases the action of the pulse, antagonizes the action of muscarine, and after some days excites tetanus in frogs. Mr. Tweedy arrives at the conclusion that if there be any difference between them, the extract of duboisia is more prompt and energetic than atropine and certainly very much more so than the strongest extract of belladonna. When diluted with twenty parts of distilled water the solution does not cause smarting and but little watering of the eyes, while the pupils become more rapidly and completely dilated than when the undiluted extract is used. In every case in which the duboisia has been used by Mr. Tweedy its action has been beneficial, and he is tempted to believe superior to that of atropine.

For the above notes I am largely indebted to Dr. Bancroft's paper on Duboisia and Pituri, read before the Queensland Philosophical Society at Brisbane.

My object in bringing these notes before the Society is to point out that there exists a plant in tolerable abundance from which an active principle may probably be obtained more economically than from belladonna, and which possesses the same properties as atropine. As an external application duboisia might also prove a valuable remedy.

[*The discussion on this paper is printed at p.* 720.]

NOTE ON THYMOL.

BY W. WILLMOTT.

The substance most frequently in use at the present time as an antiseptic is undoubtedly carbolic acid, and this is so unexceptionable in all respects save one, that it will presumably be difficult to find any compound of a similar character that will permanently take its place. Carbolic acid, however, is an irritant poison, and even when used surgically in the form of spray, or interspersed through the now familiar gauze, is liable to become absorbed into the circulation. For this reason any available substance of a non-poisonous or non-irritant character, which may be shown to possess equivalent antiseptic power, would be gladly welcomed as supplemental to it. Considerable attention has of late been directed to thymol, and, unquestionably, thymol is a very powerful antiseptic.* I have recently tested its effects in varying proportions on some of the more putrescible infusions, commencing with the two-thirds of a grain to the ounce, or 1 in 720, and gradually decreasing the quantity down to the forty-eighth of a grain to the ounce, or 1 in over 20,000.† In the case of infusion of hay there was not a single breakdown in the whole series, though the specimen prepared without the antiseptic gave way within

* I am not prepared to endorse the conclusion of Bucholtz that thymol possesses ten times the strength of carbolic acid. In my hands it has proved only as four to one.

† The thymol used was obtained from Messrs. Morson and Son, of Southampton Row, and this I found to be fairly soluble in 720 parts of distilled water (gr. j in ℥iss) at or above 120° Fahr. There was slight opalescence when cold, but no crystalline or other deposit.

the usual three days. Here, then, was a distinct effect produced in the wide proportion of 1 to 20,000, or, strictly speaking, 1 to 23,040. Calumba broke down at the one-sixteenth of a grain, the one-twelfth of a grain remaining intact. Gentian, which is not so putrescible, held its ground up to the one-twenty-fourth of a grain, but old hay, which is extremely liable to ferment, succumbed in every instance above the one-eighth of a grain, at which point it remained without change. It was an exceedingly interesting experiment now to innoculate the pure infusions with living bacteria and note the result. So far as it has yet gone (and time may modify the conclusion), the inference to be drawn from this experiment is, that, well within the range of its solubility, thymol not only prevents the quickening of germs, if germs they are, but arrests the growth of developed organisms. This, of course, is a very important element in the case.*

But though thymol may be an effective preservative as regards putrescible infusions, it does not necessarily follow that it will be found efficient or even available for the antiseptic treatment of wounds, because the conditions are different. Very good results, however, appear to have been obtained from its use in this way by some professors in Germany.

With regard to its internal administration as an antiseptic febrifuge, we must not, I think, be too sanguine of its success. Many substances of a similar kind have already been tried, such as sulphurous acid, peroxide of hydrogen, chloroform, salicylic acid, and so forth. All these are powerful non-poisonous antiseptics, and yet they fail to apply themselves to the doctrine of *contagium vivum*. It is quite possible, however, that thymol may be an exception to this rule.

Referring for a moment to the solvents of this substance (a point which has already been ably dealt with by Mr. A. W. Gerrard), we should rather expect that chloral hydrate, itself a good antiseptic, would have some solvent action upon it, and so, in fact, it has. If thymol be dissolved in a small quantity of absolute alcohol, the mixture is not soluble in distilled water, but it is freely soluble in a strong solution of chloral hydrate when the proportion reaches 1 of thymol to 12 of the solid hydrate. The thymol in this combination (about 20 grs. in the ounce) is again soluble in distilled water to the extent of about 1 in 600. The gain is not much, but I mention the fact for what it may be worth.

Though promising to take an important position amongst antiseptics, the progress of thymol in this direction is not, perhaps, of so marked or rapid a character as might be desired.† On the other hand, the essentials of ready solubility, convenience of application, and certainty of result, seem more than likely to secure indefinitely for carbolic acid—with which comparisons have been made—a prominent share of the high favour it now so justly commands.

* The results here given are entirely independent of conclusions arrived at by MM. Bucholtz and Lewin in their experiments with this and other substances of a like nature.

It may be worth remarking that the antiseptic power of commercial oil of thyme is not altogether lost by the absence or withdrawal of the thymol it is supposed to contain. This oil is sufficiently soluble in water, with or without extraneous aid, to render it an antiferment of considerable potency. Hence, probably, its good effect in preventing or retarding the rancidity of oils and fats.

Thymol, in solution, exposed to the air, passes quickly away. A fully protected specimen left in an open vessel a few days since is now being rapidly attacked by the mould fungus.

† It may be mentioned, as a circumstance favourable to its increasing use, that it is now undergoing an extended trial in the practised hands of Professor Lister, who, for the present, gives the preference to the formulæ successfully adopted by Volkmann.

HYDROBROMIC ETHER.*

BY JOSEPH P. REMINGTON.

Hydrobromic or bromhydric ether, C_2H_5Br, although discovered so long ago as 1827, has remained in comparative obscurity until lately.

Attention has been drawn to it through its asserted superiority as an anæsthetic to the agents usually employed, and reasoning from its chemical composition and the therapeutical effects of its component parts, it is really surprising that it has not been brought to notice before, and used extensively. Under the head of a "New Anæsthetic Agent,"† a notice, as follows, appears of it: "Rabuteau, in a memoir read before the Académie des Sciences, states that he has investigated the physiological properties and mode of elimination of hydrobromic ether. He has satisfied himself that this anæsthetic agent, which possesses properties intermediate to those of chloroform, bromoform, and ether, might be advantageously employed to produce surgical anæsthesia. The hydrobromic ether is neither a caustic nor an irritant. It can be ingested without difficulty, and applied without danger, not only to the skin but to the external auditory meatus and to the mucous membrane. It is eliminated completely or almost completely by the respiratory passages in whatever way it may have been introduced into the system." ‡

Dr. Lawrence Turnbull, of Philadelphia, is at present engaged in investigating its physiological properties, and measurably confirms Rabuteau in his views, although his labours are as yet not complete. At the request of Dr. Turnbull, the writer undertook the preparation of the compound, and found that several methods had been suggested. Almost all of them were tried with a view of developing the most practical formula, and the processes will be considered in the order of their publication, and all, it will be seen, depend upon the action, in some way or other, of bromine on alcohol. Serullas, who is entitled to the credit of discovering the liquid, prepared it as follows: One part of phosphorus and forty parts of alcohol of 38° Bm. are introduced into a tubulated retort, and seven or eight parts of bromine gradually added, whereupon the mixture becomes heated and hydrobromic and phosphorous acids are produced. The tubulus is then closed, the mixture distilled at a gentle heat, the distillate collected in a cooled receiver, and the hydrobromic ether separated from it by water, to which, if the distillate contains acid, a small quantity of potash is added.

Löwig prepares it as follows: "Absolute alcohol gradually mixed in a distillatory apparatus with a treble quantity of bromine, and heated from without, towards the end of the process yields a distillate consisting of two layers. The lower reddish stratum, which consists of bromide of ethyl, a small quantity of bromide of carbon, C_2Br_4, and free bromine, is freed from the latter by agitation with dilute potash till it loses its colour, and then from bromide of carbon by distillation."

De Vrij states that it may be prepared by distilling four parts pulverized bromide of potassium with five parts of a mixture of two parts strong sulphuric acid and one part of alcohol of 96 per cent.

Personne (*Compt. Rend.*, lii., 468) recommends for its

* Read before the American Pharmaceutical Association. From the 'Proceedings.'

† *American Journal of Pharmacy*, March, 1877.

‡ *Med. and Surg. Rep.*, February 24th.

preparation the use of amorphous instead of common phosphorus. Forty grams amorphous phosphorus are mixed in a retort with 160 grams absolute alcohol, and 100 grams of bromine are slowly poured in through a narrow tube passing through a cork fitted into the neck, the retort being kept cool. The mixture is then distilled into a cooler receiver, the distillate treated with water, and then dried over chloride of calcium and rectified.

Hofmann, whose valuable researches on the anilins have rendered his name famous, in the course of his indefatigable pursuit after colours hit upon a method of making ethyl bromide pure enough for his purposes by simply heating amyl bromide with ethyl alcohol.

Amyl bromide, $C_5H_{11}Br$, is prepared by saturating amyl alcohol with gaseous hydrobromic acid, mixing the saturated solution with an equal volume of the aqueous acid, sp. gr., 1·5, and digesting slowly at the heat of a water-bath in a suitable vessel, finally washing the product with water.

The reaction which takes place when amyl bromide and ethyl alcohol are mixed is represented by the following formula:

$$B_5H_{11}Br+C_2H_5OH=C_5H_{11}OH+C_2H_5Br.$$

De Vrij's process, whilst promising good results with a minimum amount of labour, was found to produce some common ether through the action of the sulphuric acid on the alcohol, which thus contaminated the product. The process of Serullas was not desirable on account of the necessity for great care in avoiding explosion on bringing such active agents as phosphorus, bromine, and absolute alcohol together.

Bromoform, $CHBr_3$, might be a contamination also here, as its method of production by action of bromine and potash on alcohol would indicate.

The following formula in the writer's hands was found to possess less objections, and to produce a purer hydrobromic ether than any of the others that were tried:

Thirty-three troy ounces of absolute alcohol are introduced into a retort or flask, and the whole placed in an ice or cold water-bath, and allowed to become thoroughly cooled. Six troy ounces of amorphous phosphorus are then added to the cooled alcohol and the whole shaken. A glass-stoppered bottle of the proper size to hold twenty-six troy ounces of bromine is now selected; this quantity is then weighed into it, and having inserted a small fragment of broken glass between the stopper and the lip of the bottle the stopper is secured in this position, so that the bromine may be readily dropped on inverting it without the escape of any more fumes than is necessary.

The bromine is now to be slowly dropped into the mixture, care being taken to avoid too great elevation of temperature. When all of the bromine is added the whole mixture is allowed to stand twenty-four hours, when the flask is connected with a good distillatory apparatus and placed in a water-bath, and the distillation is continued as long as any liquid comes over. The distillate is then washed with water, and if acid to litmus-paper a small quantity of potash or soda solution is added to the water, and after separating the hydrobromic ether from the water it is redistilled after adding some fragments of chloride of calcium to the flask, to free from remaining traces of water.

Hydrobromic ether is a transparent colourless liquid, having an agreeable ethereal odour; heavier than water; specific gravity, 1·40 (Löwig); vapour density, 3·754 (R. Marchand); very volatile; boiling point, 40·7 C., when the barometer stands at 757 mm. (Pierre). Löwig considers its taste as strongly and disagreeably sweetish with a somewhat burning after-taste. The vapour when inhaled exerts an anæsthetic effect like chloroform. It is sparingly soluble in water, but mixes in all proportions with alcohol and ether.

It burns with difficulty, but with a beautiful green flame, which does not smoke, a strong odour of hydrobromic acid being at the same time evolved (Löwig). It is not decomposed by nitric acid, sulphuric acid, or potassium. With ammonia it yields hydrobromate of ethylamin.

DIALYSED IRON.*

BY W. H. PILE.

The attention of the medical fraternity has recently been directed to the subject of dialysed iron, or, as termed in Europe, ferrum oxydatum dialysatum. Although not entirely unknown in the United States, having been employed in France and Germany for some time, and its therapeutic virtues highly extolled in various European journals, it appears to have suddenly sprung up into notice, and the demand for it could hardly be met at first. However, accommodating manufacturers, ever alive to the wants of their co-labourers, soon undertook to supply the new demand, and learning that the only genuine article, so called, from Paris, would cost about \$5 per pound, our friends generously offered their equally reliable solution at only \$3 per pound. In a couple of weeks the price was still lower, falling to \$2·50, \$2, \$1·50, and we have now before us a card in which the writer, frankly admitting the enormous and unreasonable charges of his predecessors, offers a solution at \$1 per pound. It has certainly not reached bottom yet.

Having our thoughts directed to this subject, and learning from Graham's investigations on dialysis that chloride of sodium would pass through a parchment septum with greater rapidity than any other crystalloid substance, we concluded to use a solution of carbonate of soda in place of aq. ammonia, which was proposed by others. From a few random notes taken at the time, August 1st, 1877, we read: That to a pint of sol. sesquichlor. iron, U. S. P., add slowly, and with constant stirring, a cold saturated solution of carb. soda until a small quantity of the precipitate carb. iron remained undissolved. Poured the whole on the floating dialyser, which consisted of a sheet of genuine parchment-paper firmly bound to a broad hoop and immersed in a tub of pure water. Here I may remark that the gravity of this solution was 1·175. In twenty-four hours, the water in the tub, which had become strongly saline, was replaced with fresh water. The gravity of the iron solution was now only 1·055. This was found to depend not alone on the removal of the chloride of sodium which had passed through the parchment, but upon the passage upwards of a large quantity of water. By continuing this daily change of water for five days, the gravity of the iron solution becoming daily less and the quantity at the same time increasing, I found the quantity in the dialyser to be nearly five pints, and it was then nearly tasteless. Replacing the solution in the dialyser again, with the addition of a slight excess of sol. carb. soda, continued the process for three days more. The finished product was then found to have a gravity of 1·0295, tasteless, clear, and bright. By evaporating 100 grs. of this to complete dryness 5 grs. were left. Samples of this solution are here shown. From an experiment with a solution obtained from another house, the gravity of which was only 1·022, I obtained a dry residue of not quite 3 grs., while from still another, of gravity of 1·029, a residue of 5 grs. was left. The taste of all these samples was about similar. They all show the presence of hydrochloric acid by precipitating with ammonia, filtering, and saturating with pure nitric acid, and testing with nitrate of silver. The amount of acid in these, however, I did not determine from want of time. The gravity I suggest would give a reliable test of the strength of the preparation, 1·029 = 5 per cent.

* Read before the American Pharmaceutical Association at Toronto.

The Pharmaceutical Journal.

SATURDAY, MARCH 9, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE WEIGHTS AND MEASURES BILL.

THE correspondence between the Board of Trade and the President of the Pharmaceutical Society, which came under the consideration of the Council at its meeting in February, will have made known to our readers the intention of the Government to bring in a Bill to consolidate the law relating to weights and measures. This Bill has now been printed, and on Tuesday last it was read a second time in the House of Commons and referred to a Select Committee. Although professedly only a consolidation of the existing law, as contained in various statutes dating from Magna Charta onwards, it is necessarily more than this, for whilst it was not primarily intended to ask Parliament to do more than to say whether the present law is or is not correctly re-enacted in the Bill, yet the bringing into one Bill of the contents of several Acts passed at different and, in some cases, distant dates has necessarily involved certain amendments of detail. These amendments may be divided into three classes: (1) those necessary from the consolidation of laws varying for different parts of the kingdom; (2) those necessary through changes of circumstances and practice that have grown up and become partially sanctioned since the passing of certain Acts; and (3) those desirable for removing doubts as to the construction of the law and for the correction of mistakes. In the third class of amendments specially, and in the Act generally, there are several points worthy the attention of pharmacists.

The principal clause of the Bill, the 19th, enacts that every contract, bargain, sale, or dealing in the United Kingdom, for work, goods, wares or merchandise, or other thing done, sold, delivered, carried, or agreed for by weight or measure, shall be deemed to be made according to one of the imperial weights or measures "ascertained by this Act," or some multiple or aliquot part thereof, or if not so made, with the exception to be presently mentioned, shall be void. Such dealings are for the purposes of the Bill defined as "trade," and any person trading by any denomination of weight or measure other than one of the imperial weights or measures, or some aliquot part thereof, is to be liable to a fine of forty shillings for every such sale.

The "imperial measures of weight and capacity" are those with which we as pharmacists are most concerned. The latter may be briefly dismissed with the statement that the gallon is to be the unit or standard of capacity from which all other measures of capacity, as well for liquids as for dry goods, shall be derived, and the gallon is, as at present, to contain ten avoirdupois pounds of distilled water weighed in air at a temperature of 62° Fahrenheit, and with the barometer at 30 inches.

The measures of weight are to have for their unit the imperial standard pound, which is identical with the present avoirdupois pound, and the relations of this to the dram, ounce, stone, hundredweight and ton, are defined in accordance with and are to be known as the avoirdupois system. But there is to be one notable addition, and that is the avoirdupois grain, or the one-seven-thousandth part of the imperial standard pound, the Bill thus practically endorsing the action of the Medical Council in introducing an avoirdupois grain for the purposes of the British Pharmacopœia. In the clause applying the Bill to Ireland, however, the grain is omitted, and the "quarter" is introduced. There is one exception to the avoirdupois system, the ounce troy, which is defined as 480 grains, but the troy pound and the troy pennyweight are omitted.

By clause 20, all articles sold by weight are to be sold by avoirdupois weight, except that gold and silver, and articles made from them, also platinum, diamonds, and other precious stones, may be sold by the ounce troy, or by any decimal parts of such ounce, and drugs, when sold by retail, may be sold by apothecaries' weight. Every person who acts in contravention of this clause is to be liable to a fine not exceeding five pounds. We may suppose that the permission to use apothecaries' weight in the retail sale of drugs is a concession to the opinion expressed by the Council of the Pharmaceutical Society, but it is worthy of note that whilst it has been considered necessary to define the troy ounce, no definition is given of any of the weights of the apothecaries' system. Further, although clause 24 enacts that any person who has in his possession for use for "trade" a weight or measure which is not of the denomination of some Board of Trade standard is liable to a fine of five pounds for a first offence, and ten pounds for a second, neither the scruple nor the drachm apothecaries' appears as such in the list of Board of Trade standards given in the second schedule to the Bill.

We are sorry to notice, moreover, that in making what are termed in the memorandum accompanying the Bill "inevitable amendments" for the purpose of clearing up doubtful points, a decidedly retrograde step has been taken with respect to the metric system. It will be recollected that in 1864 an Act was passed, the preamble of which recognized the expediency of legalizing the use in this country of the metric system of weight and measures. The three sections of the

Act, however, whilst establishing the validity of contracts or dealings in which the weights or measures expressed or referred to are weights and measures of the metric system, hardly went so far as might have been anticipated from the phraseology of the preamble, and the Scotch and English legal authorities are at issue as to whether, this Act notwithstanding, the use of a weight or measure that is not an imperial weight or measure is or is not illegal, even when not used for commercial purposes. The present Bill cuts the knot by proposing to repeal the Act in question. In its place it enacts, as previously quoted, that none but imperial weights and measures shall be kept or used for "trade" purposes. On the other hand this limitation of the prohibition to weights used for "trade" purposes allows of their being kept for scientific purposes. Neither is a contract or dealing to be invalid because the weights or measures expressed or referred to therein are those of the metric system; but the third schedule of the Bill contains a table giving in terms of imperial weights and measures the equivalents of the weights and measures of the metric system, and this table may be lawfully used in computing and expressing the weights and measures of the metric system. So that it would appear that if a pharmacist had a foreign prescription, expressed according to the metric system, brought to him to dispense, he would not be at liberty to use metric weights and measures, although they might be in his possession for other than "trade" purposes, and he would have to render the quantities into their equivalents of the imperial system.

But although the Bill contains some features which, in our opinion, might be advantageously altered, it would be a decided gain to get the law relating to weights and measures thus concentrated into one Act. The consideration of the subject would be thus much simplified, and a clear perception of the future modifications that may be necessary much facilitated.

THE BOTANICAL SOURCE OF TOBACCO.

In the recently published Catalogue of the Museum of the Pharmaceutical Society, *Nicotiana rustica* is said to yield "Latakia, Turkish and Manilla" tobacco and *N. repanda* "the Cuban and Havana." These statements, which are made in several materia medica treatises, including 'Pharmacographia,' whence they have been copied into 'Medicinal Plants,' are incorrect. With regard to Latakia tobacco, it has been recently conclusively shown to be manufactured from *N. Tabacum* and not from *N. rustica*. As to Cuba and Manilla tobaccos, we are not aware of the original source of the above statements or of the data upon which they are founded. *N. repanda*, Willd., is a Mexican plant with small foliage; the authority for its occurrence in Cuba is Dunal, who referred to it the *N. lyrata*, H. B. & K., which was found near Havana in that island. During a visit to London last year Senor Vidal of Manilla examined the species of *Nicotiana* in our great herbaria, and he stated that, so far as he knew, no such plant as *N. repanda* is now found in Cuba either wild or cultivated, and that the whole of the tobacco crop now grown there is the ordinary large-leaved form of *N. Tabacum*, var. *macrophyllum*, Dun. He also stated that the Manilla tobacco is absolutely identical with that of Cuba, having indeed been imported there from the latter colony. It thus appears that the old well-known species *N. Tabacum* affords the bulk of the best tobaccos of the world.

QUOS DEUS VULT PERDERE DEMENTAT PRIUS.

The House-Surgeon at the West London Hospital (Mr. E. Wilson), in a communication to a recent number of the *Lancet*, supplies a fresh illustration of the fact that human stupidity may sometimes triumph over poison cupboards, poison bottles, poison labels and all their allies. A woman and her daughter were recently admitted to the above hospital suffering from having swallowed between them an ounce and a half of lotion, containing about three grains of sulphate of atropia. A bottle having been required, and none other being handy, the poison label was scratched off that in which the lotion had been supplied, and the lotion poured out into a tea cup. Subsequently the patients, forgetful of what had been done, and not noticing the lotion, had filled the tea-cup with tea and drunk the mixture between them. Under suitable treatment both patients recovered.

A continental patient, however, according to the *Belgian Medical Press*, recently outdid even this, and succeeded in making his medical attendant *particeps criminis* in what might have otherwise been designated a suicide. The man was suffering from lead paralysis, and had been ordered to take two strychnine pills. These producing no effect, the quantity was increased, but still with no result. At last the medical professor under whose charge he was, increased the dose to five, with the difference, however, that he saw them taken himself. Two hours afterwards the patient was dead, and the previous doses of pills were found under his pillow.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A Meeting of the above Association will be held on Thursday evening, March 14, at 8 o'clock, when a paper will be read by Mr. W. R. Dunstan on "The Chlorides of Iodine."

DEATH OF AN ANNUITANT.

We regret to have to announce the death of another Annuitant on the Benevolent Fund in the person of Mrs. Sophia Wick, who died on Sunday last, March 3rd. Mrs. Wick was elected an Annuitant in 1874, after the death in the same year of her husband who had also been an Annuitant.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, March 6, 1878.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Gostling, Greenish, Hampson, Hanbury, Hills, Mackay, Robbins, Sandford, Schacht and Shaw.

The minutes of the previous meeting were read and confirmed.

The Deputation to Scotland.

The President said he felt it only right to say a few words in reference to the deputation which was appointed at the last meeting to visit the North British Branch on the occasion of the last examination. It was decided by the Council that two members of the Board of Examiners should be requested to form part of the deputation, but upon the matter being brought before the body, three gentlemen were nominated, Messrs. Corder, Moss, and Taylor, from whom he felt it difficult to make a selection. He therefore took upon himself the responsibility of asking all three to go to Edinburgh, feeling that in their persons were represented the three main departments of the examination, viz., Chemistry, Botany, and Pharmacy. It was not his place to say anything in regard to the nature of the examinations, on which no doubt those gentlemen would make a report to their Board. He could only speak as to the general system of examination as carried on in the North, and he must say at once that he was exceedingly gratified in all he saw of the arrangements as far as he could understand them. In the first place the accommodation was much better than it was when he visited Edinburgh a few years ago; there were three rooms, the largest of which was a light, pleasant room, well adapted for the purpose; the middle room was devoted to dispensing, and another room at the back was well adapted for the chemical part of the examination. The dispensing department he thought reflected great credit on the examinations in the North, and probably the deputation would be able to indicate to the London Board certain points in which they might introduce improvements, though of course he did not wish to prejudge any decision the examiners might come to. There were some little matters, perhaps, as with regard to the reading of prescriptions, in which they were not quite on all fours with the practice in London. The larger room contained the museum, which was by no means to be despised. He was exceedingly pleased to find it was so good; some of the specimens, if not unique, being such as were not to be found in the museum at Bloomsbury Square. He hoped, therefore, that when a supplement to the catalogue was published, such specimens in the Edinburgh museum as were worthy of special notice would be included in it. With regard to the examinations generally, they appeared to him to be conducted very much in the same way as in London. A few differences in the merest detail were all that occurred to him. He noticed, however, that the examiners were, as a rule more advanced in years than the English Board, and he did not know that they were any the worse for that. He had been much pleased with the earnest and kind way in which they conducted the examinations. He believed it would be very useful if such an interchange of visits were made more frequently, as thus any misunderstanding as to the mode of conducting the examination which might be supposed to exist would be removed. He hoped, therefore, that the visit would soon be returned by a deputation from the Scottish Board; and in conclusion, he expressed his warmest thanks to Mr. Mackay for his unremitting efforts to make the visit of the deputation pleasant.

Mr. Sandford, after heartily confirming the remarks of the President, said he went to Edinburgh, feeling it well that there should be an occasional interchange of communications between the bodies North and South of the Tweed, and he returned more fully convinced on that point. With regard to the examinations no doubt the examiners who had attended would make a report, but speaking generally, he could not see anything to find fault with. The examiners seemed to be quite as strict as in London, but were perhaps more kind in leading on their candidates; as he looked upon it to be as much the object of the examiners to pass candidates as to reject them, he thought they were quite right in doing so. They did not put the answers into the young men's mouths in any way, but seemed disposed to lead them on; being older men, not quite so fresh from the school, might be the reason of it. He was sorry to see a great many failures on the day the members of the deputation were there, and this might perhaps be partly accounted for by their presence, which might somewhat embarrass the young men. He very much admired the dispensing counter, and could not help thinking that the more a young man was made to feel at home when he was being examined the better. As for the hospitality of their friends in the North, and their loyalty to the Pharmaceutical Society, he could not say too much, and hoped there would be a return visit paid in April next.

Mr. Hills asked if the rooms were all that could be desired.

The President said they were very good as far as they went, and he was much pleased with them, but at the same time another room was much wanted. There was no waiting room for the candidates waiting to be examined, who had to sit on forms in a portion of the dispensing room parted off by a screen. It also necessitated their all breaking off for refreshments at 1 o'clock, even if in the middle of an examination.

Mr. Mackay said it was very gratifying to him to find, both from the President and Mr. Sandford, how much pleased they had been with their visit. Although not a member of the Board of Examiners, he might be allowed as Secretary to say that few things had gratified him more than the deputation of last week. He might add, however, that the deputation came down under somewhat peculiar circumstances. A short time ago, certain discrepancies in the returns were noticed, and many members felt it was very remarkable that during 1877 the rejections should be about 25 per cent. in Edinburgh, whilst they were about 48 per cent. in England. The North British Branch therefore went into the matter somewhat carefully, and an examination of the books showed there were the most curious divergences of results in different days; for instance, on one day only three or four out of fourteen would pass, and the next day, the proportion would be reversed. They therefore went further back, three, five and six years, and when they came to add up the rejections in Edinburgh for a series of years and contrast them with the rejections in the same time in London, it was astonishing to find how nearly the results approximated. The average percentage of rejections for five years was 38 or 40 in Edinburgh, and from 46 to 50 in London; so that there was a discrepancy, but not much. He had no doubt the members of the Examining Board would say something in their report on this point, and there was nothing the Edinburgh Board desired more than that there should be perfect uniformity in the examinations in all respects. Mr. Sandford had alluded to the style of examination being a little different from that in London; he had never been present at an examination in London, but he knew that in Edinburgh the examiners did lead the candidates a little. He had known examiners who put certain substances before a candidate, or asked him certain questions, but never told him whether he was right or wrong, and he had known candidates who failed to be utterly surprised, fancying they were going on all right. It seemed to him perfectly right to tell a candidate whether he was right or wrong; if he were right it encouraged him, and if he were wrong, it made him more careful.

Mr. GREENISH was very glad to hear from the President that the dispensing arrangements in Edinburgh were so satisfactory. He had more than once brought the arrangements of the dispensing counter before the Council; the octagon room had been rearranged under the superintendence of the President, and he hoped the same thing would be done for the dispensing. When so many candidates were rejected in dispensing it was important that every facility should be afforded to them.

Mr. BOTTLE thought it would be well that a deputation from the Scottish Board should be invited to attend the examination in London in April next. Without anticipating any report the examiners who had attended would make, he thought the Council was in a fair way of equalizing the examinations. Probably the President was right in saying that any differences were owing to the greater age, as a rule, of the Scottish examiners. Probably they showed more judgment in drawing candidates along, and therefore succeeded in passing more. He would move, therefore, that a deputation from the Scotch Board be invited to come to London at the next examination.

Mr. ROBBINS seconded the motion.

Mr. SCHACHT asked if it would be legal for a member of the Scotch Board to take part in the examinations in England, and *vice versâ*.

The PRESIDENT said not as examiners, only as visitors.

Mr. SCHACHT regretted to find that this was so, because he thought the best way of making the examinations identical would be a positive part to be taken by members of the one Board in the examinations conducted by the other. If this could not be done, and the difference as it appeared was slight, he thought, perhaps, one return visit would be sufficient, and they need not have them continually as was suggested.

Mr. SANDFORD said he had mentioned to the examiners in Scotland Mr. Schacht's suggestion as to the interchange of examiners, proposing a slight development of it to this extent, that one or two men should be appointed on both Boards, so that there might be two Englishmen who should attend the Scotch examination as well as the English, and two Scotchmen who should attend the English as well as the Scotch. He was quite sure that their friends in Edinburgh were of the same opinion as to the desirability of uniformity, but when he mentioned it to them the other day there seemed to be a doubt whether they could find a couple of examiners who could spare the time, because it would consume a great deal of time to go backwards and forwards so often. There was no doubt the suggestion was an excellent one if it could be carried out.

Mr. SCHACHT said Mr. Sandford's elaboration of his suggestion struck him as being very good indeed.

The PRESIDENT thought by appointing occasional deputations, not always consisting of the same men, they would hear and see more of what went on, and any discrepancies could be corrected.

Mr. HAMPSON expressed his gratification at the development given to Mr. Schacht's proposal by Mr. Sandford. It struck him that it would be much better to have an interchange of examiners actually working on the different Boards than to have these visits of deputations, who were witnesses rather then examiners. They must consider not only that it would be more beneficial in introducing equality in examinations, but it would be also fairer to the candidates, and, after all, their feelings ought to be considered. A Scotchman examining at the English Board would have an opportunity of ascertaining the character of the examinations in England, and *vice versâ*; but when there was a deputation present and a Government visitor besides, it must work disadvantageously to the candidates; in fact, he should say it would amount almost to serious embarrassment. On these grounds he hoped there would be another opportunity of considering this matter, and that the Council would not decide anything off-hand.

Mr. MACKAY said such a change could not be effected during the present year, and therefore there would be ample time to consider it. He would suggest, however, whether it would not be better to invite the deputation from the Scotch Board to attend in June rather than in April, because in that month they had no examination of their own, and would be, therefore, more at liberty.

The VICE-PRESIDENT thought Mr. Mackay's proposition an admirable one, and also Mr. Schacht's; but in the latter he saw practical difficulty, because the gentlemen appointed examiners in England could only act legally for their respective appointments, and he thought they would require an alteration of the Bye Laws to meet the suggestion.

Mr. BETTY said that this was a most important proposition, and he was glad to see the few words Mr. Schacht had thrown out at the last meeting had been so thoroughly agreed to. They might, by an occasional interchange of visits, produce uniformity; but what they wanted was to produce identity, and unless they did that they only went half way. If they agreed that this was a desirable object, it was not for them to be deterred by small matters of detail, such as had been mentioned. It appeared to him a most simple matter when they elected a new Board of Examiners to elect them indiscriminately for England and Scotland. He did not doubt there would be every facility given if the Council wished to so constitute the next Board that the members might attend either one centre or the other; at any rate, that would be a point of detail which could be discussed in committee. The principle involved was of such serious importance that he hoped before the next meeting Mr. Schacht would move that a committee be appointed to consider how such a Board could be appointed, and to report before the next election of the Board of Examiners, so that practical effect might be given to the very valuable suggestions which had come out of this discussion.

Mr. BOTTLE thought the mixed Board of Examiners was not practicable without amending the Bye Laws, because section 2 of Bye Law 10 said that the Council shall at the first meeting in December appoint fit and proper persons *in* Scotland. He read that to mean persons residing in Scotland. He did not think there was any restriction with regard to the members of the English Board, but he did not see how Englishmen could go to Scotland.

The PRESIDENT said this matter was talked over before the North British Board, and he gathered the opinion that gentlemen in North Britain would not feel themselves justified in accepting the post of examiners in London as they could not spare the time. They were mostly gentlemen of eminence who would not be tempted by any fee the Society could afford to pay to sacrifice so much valuable time as would be required.

Mr. HANBURY entirely agreed with the suggestion that, if it were possible, arrangements should be made to elect one general board, the members of which should thus be qualified, *ex officio*, to attend at either centre indiscriminately, and he could not believe that the difficulties were insurmountable.

Mr. ATKINS also agreed in the desirability of getting the examinations identical, but after all they had heard that day he could not help thinking they were making a much more serious matter of this than was necessary.

The PRESIDENT said he was much struck with the way in which the examinations were conducted, and it appeared on taking a larger series of years that there was not so much difference between the results as had been supposed. He thought it would be wiser to go on with an occasional interchange of visits such as they had had, and effect what was desired without altering the Bye Laws.

It was then resolved unanimously—

"That two of the Examiners of the North British

Branch and Mr. Mackay be invited to attend the meeting of the Board of Examiners in London, in June, and that they be severally paid their travelling expenses and two guineas for each day on which they attend the meeting of the Board."

It was also resolved—

"That the Parliamentary Committee consider upon the desirability and practicability of such an alteration or alterations in the mode of appointing examiners by the Council under the Pharmacy Acts as may conduce to a joint system of examination being introduced in England and Scotland, and report thereon."

The following being duly registered as Pharmaceutical Chemists were respectively granted a Diploma stamped with the Seal of the Society:—

Atkins, William Ralph.
Branson, Frederick Woodward.
Cullingford, Louis James.
Curtis, Frederick George.
Miller, Cecil Bradley.
Redford, George Alfred.

Elections.

MEMBERS.

Pharmaceutical Chemists.

Atkins, William Ralph ....Salisbury.
Branson, Frederick Woodward..London.
Cullingford, Louis James ......Bletchingley.
Curtis, Frederick George.........London.
Miller, Cecil Bradley ....London.
Phillips, Evan ....London.
Redford, George Alfred ....Liverpool.

Chemists and Druggists.

James, John ....Weston-super-Mare.

ASSOCIATES IN BUSINESS.

The following having passed their respective examinations, being in business on their own account and having tendered their subscriptions for the current year were elected "Associates in Business" of the Society:—

Minor.

Agger, Joseph Edward .. ..London.
Biddiscombe, Charles ....London.
Collitt, William.....................Gainsborough.
Edwards, Frederick William ...Keighley.
Finney, Arthur Cook .. ..Brigg.
George, John ....Wolverhampton.
Halhead, John Armistead ......Carlisle.
Holgate, Sam Verity ....York.
McAlley, Robert ....Edinburgh.
Newitt, Herbert Henry ....Long Buckley.
Purrell, John Rushton............Liverpool.

Modified.

Blissett, William ....Romsey.
Cole, George ....Jersey.
Harrop, William Hutchinson ...Crewe.
Knight, William ....Hinckley.
Mount, James ....Addiscombe.
Shirtliff, William ....Shepherd's Bush.
Weaver, Theophilus.. ....Birmingham.

ASSOCIATES.

The following having passed their respective examinations and tendered (or paid as Apprentices or Students) their subscriptions for the current year were elected "Associates" of the Society:—

Minor.

Ascott, Tom ....Exeter.
Ashweek, John Sydney ....Torquay.
Brumwell, Herbert ....Fleetwood.
Budden, George Alfred ....Wareham.
Chapman, Leonard Parker..... Rochdale.
Crook, Arthur William ....Preston.
Gourd, William.....................Stoke, Devonport.
Hall, Richard Arthur ....Leigh, Lancashire.
Hawken, Alexander...............St. Austell.
Hoare, William Parker ....Cirencester.
Jones, Evan Jones ....Lampeter.
Jones, George ....Bedford.
Lockyer, William Walter ......Deptford.
Martin, William Lee ....Derby.
Need, John ....Great Malvern.
Russell, William ....Aberdeen
Skelton, John Hardy ....Gainsborough.
Stobbs, Robert ....North Shields.
Thomas, John Edward ....Swansea.

Modified.

Hadley, James William ....London.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary Examination and tendered their subscriptions for the current year were elected "Apprentices or Students" of the Society:—

Benson, Henry Thomas ....Aberystwith.
Buckham, William Thomas ...New Shildon.
Carr, John Walter ....Barnsley.
Carveth, William Uglow.........Plymouth.
Francis, Frederick Tanton ......Tavistock.
Glaisyer, Edmund .. ..Brighton.
King, Arthur.........................Norwich.
Littlewood, Harry ....Hempstead.
Lockwood, Thomas ....York.
Milner, Thomas ....Thirsk.
Orange, Edward Henry ....London.
Pars, Charles Frederick R........Lincoln.
Platt, Joseph.........................Stalybridge.
Richardson, Chas. Bloomfield ...Chesterfield.
Robinson, Alfred Edward ......Birmingham.
Scammell, Luther Robert ......Adelaide.
Scammell, William Joseph ......Adelaide.
Sharpe, William Cecil ....Madeley.
Watts, Robert ....Sheffield.
Way, John Francis ....Lower Tottenham.
Whitrod, Henry Frederic ......Diss.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

Reports of Committees.

FINANCE.

The report of this Committee was received and adopted, and various accounts ordered to be paid.

The Auditors' report was also laid on the table.

The PRESIDENT remarked that the receipts were much the same as usual, but there had not been so much expended.

The VICE-PRESIDENT said it was satisfactory to find that the expenditure on the Journal had been £158 less, and there was also a less expenditure on fixtures and fittings.

Mr. SHAW said the item for carriage of books was smaller than last year. He supposed that showed a less circulation.

The PRESIDENT replied that was the case. He had pointed out when in the North that the library was equally available for Scotland as for England, and he might add there was a proposition before the Library Committee that the carriage one way of books borrowed by associates and apprentices should be paid by the Society.

Mr. ATKINS asked if the amount paid to the College of Preceptors for conducting the Preliminary examinations was an addition to their expense, or did it replace a similar item which had been paid before.

Mr. Cracknell said it was according to the number of papers sent up, and was on the same scale as formerly.

The report of the Auditors was then received and adopted.

It was also resolved that the preparation of the annual report be referred to the Library, Museum and Laboratory Committee.

Annual Meeting and Conversazione.

It was resolved that the Annual Meeting of the Society be held on Wednesday, the 15th of May, and that a Conversazione be held on the same evening; that the Secretary be instructed to apply to the Lords Committee of Council for the use of the South Kensington Museum, and that Messrs. Betty, Greenish, Robbins and Sandford be appointed a Committee to carry out the arrangements, with an instruction that no refreshments be provided by the Society.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£10 to a registered chemist and druggist, aged 72, who has had two previous grants.

£5 to the widow of a registered chemist and druggist, aged 48.

£10 to a registered chemist and druggist suffering from acute illness. Applicant had a similar grant in November last, but has not yet quite recovered.

£10 to a registered chemist and druggist, aged 60, who has been unfortunate in business, and was now without resources.

£10 to a female registered chemist and druggist who had a similar grant last year.

£10 to the widow of a recent annuitant.

The consideration of another case was deferred. The Committee also recommended that the Treasurer be requested to purchase £200 Consols, to the account of the Benevolent Fund, which amount included donations received since the commencement of the year, and the legacy of £100 bequeathed by the late Mr. Sagar, of Swinton, Lancashire, making the total sum invested £18,000.

The Secretary reported the death of Mrs. Sophia Wick, an annuitant, aged 78, who was elected in 1874.

Mr. Atkins asked if there was any method of registering permanently the legacies paid to the Fund, and suggested that they should be inscribed on a board, and suspended in the Society's premises.

Mr. Hanbury said they had a very good precedent in St. Bartholomew's Hospital, where one of the points of interest in the large hall was the list of the bequests and the names of the donors.

Mr. Hampson suggested that the matter should be referred to the Committee to consider; and this was agreed to.

The report of the Committee was then received and adopted.

Mr. Mackay said he did not know whether it was known to the Council, but it was known to him, that it had been the practice for a long time to make special efforts to get interesting and valuable papers for the monthly meetings of the Society held in Edinburgh, and he thought the members would agree with him that many valuable papers had been contributed. They had never paid any one who had come forward to read these papers, but those gentleman had always been informed that in the event of the paper being printed *in extenso* in the Journal that twenty or twenty-five copies of it should be supplied to them free of charge. That had been the entire expense thrown on the Society for the contributions which had from time to time appeared in the Journal, but he had just been surprised to hear from the Editor that in future he must decline to make such a concession. He replied he was always under the impression that the Society was only too glad to get the papers on these terms, but the Editor said that if he did it to one local association he must do it to every one, and therefore he must decline to do so on his own responsibility, but if he would bring the matter before the Council, and the Council thought fit to treat the North British Branch in the same way as the London evening meetings, the authors would then get the copies gratuitously. If it were determined that these papers were not to be paid for he would willingly pay for them out of his own pocket; but he did think it was splitting hairs to say that a large Society like that should determine not to give to those gentleman who read papers a few copies. He wished to know whether he was still to promise gentlemen that they should receive twenty or twenty-five copies of the Journal free.

The President was very much astonished to hear Mr. Mackay's communication, and thought it was quite a misapprehension on the part of the Editor. He was sorry the question should have been raised, and his own opinion was strong that all papers read before the North British Branch should be considered the same as those read at the London evening meetings. He was also of opinion that the authors should receive printed copies of those papers.

Mr. Shaw understood the President to mean that when a paper was read at a provincial society, and was inserted in the Journal, it should be paid for the same as if it had not been read beforehand, and that the author should also have copies at the expense of the Journal department. He hoped that arrangement would be carried out, because there was often a little difficulty in getting good papers for local associations, when they were not recognized in any shape or form. Gentlemen spent a great deal of time in preparing them, and they should not be debarred from receiving the honorarium given to persons contributing to the Journal.

Mr. Mackay said Mr. Shaw was widening the subject which he had raised, and he hoped the Council would limit the discussion to the point before it.

Mr. Hampson understood that all Mr. Mackay required was that readers of papers in Scotland, in connection with the North British Branch, should receive copies of their productions. As to the reception and payment for papers read at local associations, that was another question.

Mr. Greenish asked if twenty-five copies was the number which had generally been applied for.

Mr. Mackay said on one occasion he was asked to supply fifty. He was told at the office that the number was excessive, but that twenty-five would be allowed.

Mr. Bottle then moved—

> "That scientific papers read (and printed in the Journal) at the North British Branch should be entitled to the same privilege that they have hitherto enjoyed, and that it be an instruction to the Editor to continue the same."

He was surprised that any attempt should be made to stop the distribution of twenty-five copies of papers to gentlemen who had contributed such admirable papers as had been contributed by the North British Branch.

The Vice-President seconded the motion.

Mr. Greenish said he thought it probable that the difficulty had arisen from the large number of copies asked for in some instances.

Mr. Mackay said after that intimation he would only ask for twenty-five copies in future.

The President hoped Mr. Mackay would ask for as many copies as he thought could be usefully distributed.

The resolution was unanimously carried.

LIBRARY, MUSEUM, AND LABORATORY.

The report of this Committee included the Librarian's report, showing the average attendance during the preceding month to have been, day, 25; evening 11. Circulation of books, town 197; country, to 27 places, 41; carriage paid 13*s.* 10½*d.* The following donations to the Library were reported:—

'St. Bartholomew's Hospital Reports, 1877.' From the Hospital.

'Calendar of the Pharmaceutical Society of Ireland, 1878.' From the Society.

'Journal of Eastern Asia.' Vol. 1. No. 1. From Mr. James Collins.

'Werthbestimmung des Wismuths und des käuflichen Magisterium Bismuthi,' by J. Löwy; 'Beiträge zur Chemie der wichtigeren Gummiharze, Harze und Balsame,' by E. Hirschsohn. From Professor Dragendorff.

'An Easter Holiday in Liguria, with an account of the Garden of the Palazzo Orengo at Mortola.' From Professor Flückiger (the Author).

'The Pharmacy and Poisons Act, with Regulations.' From the Pharmacy Board of Victoria.

The Librarian reported that an apprentice at Boston, who had borrowed a book from the library, declined to pay the carriage. A discussion ensued thereupon, and it was finally resolved by the Committee to recommend that in future the carriage, one way, of books borrowed by associates and apprentices in the country, be paid by the Society, and that all associates and apprentices be allowed to retain books for the same time as members and associates in business.

The Curator had reported that the average attendance in the Museum had been, day, 11; evening 3. Also that he had received a letter from Dr. Lorentz of Uruguay, saying that he had forwarded a specimen of *Aspidospermum Quebrachs*, for the Museum; he had also received offers of specimens from Sierra Leone and Monte Video. Professor Attfield had offered to supply any chemical specimens which were badly represented in the Museum, if the crude materials were supplied to him, in cases of articles not included in the usual course of laboratory study.

The following donations to the museum had been reported:—

An Octahedron of Common Alum and Chromic Alum crystallized together, a large Crystal of Sulphate of Magnesia, a fine Crystal of Sulphate of Copper, a very perfect Crystal of Copper, and a very perfect Crystal of Red Prussiate of Potash, from Mr. W. Copney; Fine Specimens of Mogador Colocynth, from Messrs. Hearon, Squire and Francis; Specimens of Amyrin, Bryoidin, and Elemic Acid, from Professor Flückiger; Specimen of Absolute Phenol, from Messrs. Bowdler and Bickerdike; Specimens of the Monochloride and Trichloride of Iodine, from Mr. Dunstan; Specimen of Dragonwood, from Mr. G. Curling, jun.; Specimens of Artificial Oil of Rose Geranium, of Glycyrrhizin combined with Ammonia, and of Nigella Seed, from Mr. Langbeck; Specimen of Poppyhead from China, from Mr. W. A. Thirlby; Specimen of Mahwah Flowers, from Mr. T. Christy; Specimen of Iron Slag, tinted with Manganese, from Mr. W. Y. Brevitt; Specimen of Salicylic Acid and of Salicylate of Soda from Oil of Wintergreen, from Messrs. Hopkin and Williams; Specimen of Brazilian Copal, from Mons. C. Chantre; Specimen of Senna Leaves from India, from Dr. Forbes Watson; Specimen of the Stem of *Scorodosma fœtidium*, from the Curator; Specimens, in blossom, of *Cinchona calisaya*, and the hybrid *C. Anglica*, from Mr. J. E. Howard, F.R.S.

It had been resolved to recommend the purchase of two copies of 'Diccionario de voces de Historia Natural Americanas par E. Uriocœchea' now in course of publication, one for the library, and the other for the use of the Curator.

The Secretary had reported that he had received 2000 copies of the Museum Catalogue, and had forwarded copies to members of the Council, of the Board of Examiners, Government Visitors, and the Professors. He had been also instructed to send copies to honorary members, scientific societies to whom the Journal is sent; towns where the Conference had met and which possessed libraries, and to such other scientific men in England or abroad as might be suggested by Mr. Greenish, in conjunction with the Curator. It was recommended that the price fixed for the sale of the Catalogue, to those not entitled to a copy gratis, should be 2*s.*

The Professors had reported favourably of their respective classes.

The report was received and adopted.

In reply to Mr. Schacht,

The Secretary said there had been numerous applications for copies of the Museum Catalogue.

Dr. Redwood's Lecture on Spectrum Analysis.

The President thought the Council ought to pass a vote of thanks to Professor Redwood for his very able lecture on Spectrum Analysis, which, he was glad to say, was very well attended.

Mr. Greenish seconded the motion. He hoped there would occasionally be a course of lectures delivered in the Society's lecture theatre, such as he recollected some years ago.

The resolution passed unanimously.

HOUSE.

The report of this Committee was received and adopted.

SCHOOL OF PHARMACY.

A return respecting the School of Pharmacy was laid on the table.

LAW AND PARLIAMENTARY.

The report stated that at a meeting of this Committee, held on Feb. 20, a further communication had been received from the Secretary of the Board of Trade, with regard to the Weights and Measures Bill, and Professor Redwood had been invited to attend the Committee. The matter being considered, an answer had been directed to be sent, substantially adhering to the opinion already expressed.

A correspondence had been laid before the Committee respecting the Dental Practitioners' Bill, including the Solicitor's opinion on certain words in clause 5, which, it was feared, in some quarters, might be held to interfere with the interests of chemists practising dentistry.

A communication had been also read from the Home Secretary to the President, enclosing a letter from the coroner for Dover, calling attention to a case of death from "Hunter's Solution of Chloral," and suggesting that this substance should be treated as a poison. In reply, a letter had been sent pointing out that in accordance with a resolution of the Council, approved by the Privy Council, chloral hydrate and its preparations had become poisons, within the meaning of the Act, and also that the preparation referred to in this special case was a patent medicine and as such entitled to the exemptions granted to patent medicines by the 16th section of the Pharmacy Act, 1868.

At a subsequent meeting of the Committee, held on March 5, several cases of alleged infringments of the Pharmacy Act had been considered.

It being reported that the Weights and Measures Bill was referred by Parliament to a Select Committee, it had been recommended that application be made for permission to give evidence thereon before that Committee.

With regard to the Dental Practitioners' Bill, a letter sent by the President, on February 22, to Sir John Lubbock, calling attention to the objectionable words in clause 5, and asking for their omission, had been read to the Committee. The following reply had been received:—

"15, Lombard Street, E.C.,
"26th Feb., 1878.

"Sir,—I have duly received your favour of the 22nd. The point you urge seems to me to have much force in it, and I shall be happy to omit the words in question. "I am,
"Your obedient servant,
"JOHN LUBBOCK.

"J. Williams, Esq."

The Committee recommended that the Pharmaceutical Society's certificates for chemistry, materia medica, and such other subjects as it is proposed should be required in obtaining qualifications under the Bill, be accepted as part of the suggested curriculum for future examination in dentistry.

The Solicitor's Report as to certain cases placed in his hands had been also read.

The Secretary had reported that he had written to the local secretary and the informant in all cases of infringement of the Act which had been brought under his notice during the latter half of 1877. Some of the replies received had been read to the Committee.

Mr. SANDFORD said he was one of a deputation which on the 21st of February waited on Mr. Tomes, the principal promoter of the Dental Practitioners' Bill, who was quite prepared to entertain the objections laid before him, but referred the deputation to Sir John Lubbock. The correspondence with the honourable baronet had been read, and he could only say that the answer appeared perfectly satisfactory, as Sir John, in his letter of the 26th of February, had undertaken to remove those words which might be held to interfere with chemists and druggists practising dentistry.

The PRESIDENT asked if anything was said about examinations in future.

Mr. SANDFORD said the Council could not ask Sir John Lubbock to recognize rights which did not exist. If it were necessary to have examinations for dentists the Council could not ask that chemists and druggists should be exempted therefrom if they wished to practise dentistry. Referring to the paragraph in the Committee's report suggesting that the certificates of the Society should be accepted as part of the suggested curriculum for future examinations, he did not see how the Council could interfere with that. The Bill only proposed that such examinations should be held as should be determined hereafter by certain recognized bodies. This was not the right stage to deal with that question. To attempt to introduce such a thing in an Act of Parliament would be altogether out of place.

Mr. ATKINS asked who it was suggested the curriculum.

Mr. SANDFORD said it seemed to him the Committee was doing it.

Mr. ATKINS thought there would be plenty of time to see about that.

Mr. CHURCHILL said the present examination of the Royal College of Surgeons for a licentiate in dentistry would require a man who had passed the Major examination to go through a fresh examination in chemistry. That was the point the Committee wished to meet.

Mr. HAMPSON saw no objection to the report as it stood. It only showed a desire to utilize the Society's own examination so that any one who had passed an examination in materia medica and chemistry should have his attainments recognized. There was no doubt those two subjects would form part of the curriculum.

Mr. SHAW said the regulations of the Dental College required, amongst other things, that the person seeking admission must have attended chemistry and materia medica lectures. What was wanted was to ask the college which was to be formed, to receive the Society's certificates in those two departments.

The PRESIDENT thought one mistake was being made in this matter, that it was not the examiners' certificate which would be required by the future dental body, but the certificate of the professsors that the pupil had attended so many lectures.

Mr. CHURCHILL said that was the grievance. There were very few of their members who attended the lectures in the Society's school, but it was contended that those who had attained a certain amount of knowledge and had passed an examination were entitled to the benefit of it.

After some further discussion it was decided to refer back this part of the report to the Committee for further consideration.

The Weights and Measures Bill was then discussed, and some difference of opinion appeared to prevail with regard to it.

Mr. ROBBINS said that the dram avoirdupois was well known in Cornwall, but it was only known for one purpose, namely, selling saffron.

Mr. SCHACHT said there were at present three terms in common use, the drachm, the ounce, and the pound, which did not always represent the same weight. The question was, whether it would not be an advantage to have a definite idea attached to the meaning of these words.

The VICE-PRESIDENT said the question really was whether they could dispense with the drachm and the scruple, and that had been conceded by the Government.

Mr. SCHACHT said it was for vending purposes only that one set of weights should be recognized. It had been lately said that two large wholesale houses in the trade gave two distinct weights when a drachm was asked for. A pound should be so many grains, but there were avoirdupois and apothecaries' pounds, and the vendor had as much right to sell an apothecaries' pound as an apothecaries' drachm.

Mr. CHURCHILL said he knew of one or two wholesale houses which would send one-eighth of an ounce and call it one-eighth of an ounce if a drachm were asked for.

Mr. ATKINS said he himself had never seen an avoirdupois dram. He kept on his scale two weights, avoirdupois and apothecaries'. The former only was used for retail purposes, but he could quite understand that even with a drachm a technical question might arise. If a man were to ask for a drachm of nitrate of silver he would get more than half what he would if he asked for a quarter of an ounce.

Mr. CRACKNELL said it having been stated that the dram avoirdupois was used in Cornwall and simply for the sale of saffron, he had made some inquiry, and was told by a gentleman in business there for many years that he did not think the avoirdupois dram was to be found in any shop in the county. There were a few people who had a dram avoirdupois, but practically it was never used. The manner in which saffron was sold was, if a customer asked for a dram that a quarter of an ounce was weighed and divided by the eye into two parts.

Mr. SHAW produced an avoirdupois dram which he had procured in Liverpool. He said it appeared to him that the Government wanted chemists to give up the exemption they had a right to, and when he received a communication from the President on the subject he thought there would be no difficulty in complying with the wishes of the Government in respect to the use of the weights, not only in the larger denomination but the smaller also.

Mr. SANDFORD saw no reason why the Council should put itself forward to give evidence on the Bill before the House of Commons. What the Committee had asked had been conceded, and he thought it might be very well satisfied without going on a roving commission, which perhaps would undo what had been done.

Mr. HAMPSON said that in the Committee he was in favour of seeking an opportunity of giving evidence, but on reconsideration he had come to the conclusion that it would be wiser not to do so.

This part of the report it was also resolved to refer back to the Committee; and with these exceptions the report was received and adopted.

Mr. BOTTLE drew the attention of the President to the communication with regard to the chloral hydrate question, and took exception to the terms of the letter in reply, in which it spoke of the drug which had been used as coming under the exemption of a patent medicine. They had lately been interfering with cattle medicine because it contained a small proportion of opium, and if a preparation which was nothing but a solution of chloral in water could be sold by anybody who took out a patent medicine licence nothing would be easier than to evade the Pharmacy Act.

The PRESIDENT thought the wording of the letter did not bear the interpretation Mr. Bottle had put upon it. It did not commit the Council to a statement of what the exemptions were, but only said that the solution being a patent medicine was entitled to such exemptions as were contained in the Pharmacy Act.

Mr. SANDFORD said he believed this particular preparation was sold before chloral was introduced into the Pharmacopœia.

Mr. BETTY then moved—

"That the report of the Sub-Committee appointed to consider and report upon any amendments that may be expedient in the Pharmacy Act be received, adopted, and acted upon at a suitable opportunity, with such additions or modifications as may at that time be resolved upon."

He said his object was simply that the Council should receive formally, as it did every other report, the report of this Sub-Committee, which had taken much pains in the matter. It did not wish to bind the Council in any way, as would be seen by the terms of the motion, but simply that the work of the Committee should not be lost.

Mr. SANDFORD suggested that it was too late to discuss this motion, but drew especial attention to the words "acted upon." The report in question was a most crude report, and was unfit to be the subject of such a resolution.

The PRESIDENT suggested that the report of the Sub-Committee should be received and entered on the minutes.

Mr. HAMPSON said it was desirable to discuss the matter before coming to any resolution. There was not time then, but he hoped the Council would not let this matter pass in an informal way. If a time were appointed for its discussion at the next meeting some useful information might be got out of it, and he therefore suggested that the President should fix a time when it should be taken.

The PRESIDENT said it was no use passing any resolution except to receive the report and enter it on the minutes.

Mr. HAMPSON thought it was not fair to those who had taken the trouble to go into the matter that the report should be shelved.

Mr. ATKINS could not but join in the expression of opinion that when a sub-committee had been appointed, and had made a report, that report should be discussed. If it was worth nothing, and contained no practical suggestions, then dismiss it, but this could not be done until it had been considered *seriatim.*

Mr. BETTY also urged that the report should be considered and discussed.

After some further conversation it was decided to defer the discussion till the next meeting, Mr. Betty saying he would give notice of motion regarding it.

REPORT OF THE BOARD OF EXAMINERS.

February, 1878.

ENGLAND AND WALES.

	Candidates. Examined.	Passed.	Failed.
Major	11	6	5
Minor, 13th	10	7	3
„ 14th	23	9	14
„ 15th	21	12	9
	—54	—28	—26
Modified	3	1	2
	68	35	33

SCOTLAND.

	Examined.	Passed.	Failed.
Major	1	0	1
Minor	12	5	7
Modified	1	0	1
	14	5	9

PRELIMINARY EXAMINATION.

Seven certificates received in lieu of this examination:—

2 College of Preceptors.
3 University of Cambridge.
1 University of Durham.
1 University of Oxford.

A letter was read from the Chairman of the Committee of the Chemists' Ball, thanking the Council for the use of the Society's rooms for the meetings of the Committee.

A letter was also read from the Honorary Secretary to the Chemists' Assistants' Association, thanking the Council for the loan of materia medica specimens for exhibition at the *soirée* lately held by the Association.

PHARMACEUTICAL MEETING.

Wednesday, March 6, 1878.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

The minutes of the previous meeting having been read and confirmed,

The PRESIDENT said it was his pleasing duty to inform Professor Redwood that the very cordial thanks of the Council were given to him for the brilliant, beautiful, and instructive lecture which he delivered a fortnight ago.

A number of specimens, of which the following is a list, were exhibited:—

Herbarium specimens of *Duboisia myoporoides*, and various gums, from Dr. J. Bancroft; Specimens of Yellow Turtle Oil, from Jamaica, and of a root used for boils from Accra, from Mr. Ernest Samson; Specimens of Coto bark, false Cinchona, and false Ipecacuanha root, from Messrs. Curling and Co.; Specimens of Tartrate and Acid Tartrate of Strychnia, from Mr. J. F. Savory; Specimen of Sumbul root, from Mr. J. B. Allen; Specimens of Diphenylamine, Oxyacanthin, and Belladonine, of the artificial oil of Meadowsweet, Peony root and seeds, fruits of *Carduus marianus*, flowers of *Matricaria Chamomilla*, *Lamium album*, and *Primula veris*, and the dried herbs of *Melilotus officinalis*, *Fumaria officinalis*, *Galeopsis grandiflora*, and *Agrimonia Eupatoria*, from Mr. H. W. Langbeck; Analysed specimens of Java Cinchona Barks; crystals of the Bromhydrates of Quinidine and Cinchonidine, both acid and basic, and of Nitrate of Pilocarpine, from Mons. Petit, Paris; Specimen of the root of *Atractylis gummifera*, and of the seeds of *Andira anthelmintica*, from Dr. Méhu, Paris; Specimens of the bark of *Drimys Granatensis*, and of the bark of *Hura crepitans*, and false Jalap, from Professor Planchon, Paris; Specimen of false Ipecacuanha root, from Messrs. Hearon, Squire and Francis; Specimen of Ashantee Copal, from Mr. F. C. Heron.

Mr. E. M. Holmes called attention to a series of barks which had been presented to the museum by a French pharmacist, M. Petit, of Paris. Each bark had been analysed, and its ingredients were stated on the labels of the specimens, and they were therefore much more valuable than ordinary specimens. The specimen of Ledger bark contained 6 per cent of quinine. Among the articles given by the same French pharmacist was an excellent specimen of nitrate of pilocarpine and of the hydrobromates of cinchonidine and quinine. Hydrobromate of quinine was attracting general attention at the present time. There was also a specimen of copal, which though not a very pretty one, had some interest in its having been brought over by the son of the King of Ashantee. *Drimys Granatensis* sometimes came into commerce under the name of pepper bark, and was very similar to true Winter's bark, which was not an article of commerce. The coto bark he believed to be the one which contained cotoin, and not the one from Bolivia which contained paracotoin. The specimens of false yellow cinchona bark had very much the appearance of hard Carthagena bark; but Dr. Paul, who had examined it, had informed him that it contained an alkaloid similar to, if not identical with, paricine. The turtle oil was said to be used in Jamaica for consumption. It had no taste and but little odour, and although now semi-solid was liquid in Jamaica. As an animal oil it might perhaps be useful for making pomade. Several things on the table had been presented by a German chemist, who noticed that they were absent from the catalogue which had just been published. Some of them were of interest as curious chemicals. One specimen, oxyacanthin, was a neutral bitter principle obtained from the white hawthorn, and not the alkaloid oxyacanthine from the root bark of *Berberis vulgaris*. The specimen of belladonine he believed was not perfectly pure; but still it was a nice sample. He would also call attention to a specimen of false ipecacuanha which had recently appeared in the market. It was very easily distinguished from the genuine kind by its much paler colour and larger medi-tullium. Whether it contained emetine or not he did not know; but he had a sufficient quantity to supply any gentleman who would like to examine it.

Dr. Paul asked Mr. Holmes whether he had made out anything with regard to the origin or character of the false cinchona bark. A sample of one of the parcels of bark came into his (Dr. Paul's) hand, and was marked "Cinchona Bark," but it contained no quinine, and not even cinchonine, but a considerable quantity of an alkaloid which very much resembled paricine, an alkaloid which had been found in some kinds of red bark. It was amorphous, and was stated to be identical with beberine from the green-heart tree, and also with an alkaloid obtained from pareira root, and from one or two other sources. It formed amorphous salts and the peculiarity of it was that the neutral sulphate was precipitated in the form of a resinous mass on the addition of a strong solution of sulphate of soda, or almost any strong saline solution. The quantity of alkaloid in this bark was considerable. The bark was very bitter, and he believed that it was bought for the purpose of supplying it to the druggists for the making officinal cinchona preparations. With reference to the coto bark which was coming to be an article of commerce, he did not gather from Mr. Holmes what source the sample came from.

Mr. Holmes said that he did not know whence it was obtained, but he received it from Messrs. Curling and Company.

Dr. Paul said that he had examined six or eight samples of coto bark, one of which was brought into the market some two years ago, and he had not obtained results agreeing with the statements that were published some time ago by Mr. Jobst with regard to the crystallizable substance cotoin which he said was obtainable from this bark; but they all agreed in yielding a considerable amount of soft resin in which, after exposure to the air, there was a formation of acicular crystals. The character of that substance corresponded more exactly with what had been described by Mr. Jobst as paracotoin, obtained from a bark which was said to be not identical with that which he originally examined, but from another source, although presumably from the same tree. That he (Dr. Paul) believed to be the article which was chiefly to be met with now under the name of coto bark in commerce.

Mr. Umney said that he had noticed in the drug market the original packages of false ipecacuanha and also of coto bark to which Mr. Holmes had alluded. One bale of the former was in the market and four or five of the latter was a few weeks since offered for sale. He took a specimen of it, and he thought that it was *Ionidium*, and he sent it to Mr. Holmes, who confirmed his opinion in the matter. He believed that the coto bark was bought by a continental firm.

A paper was then read on—

Croton Oil.

BY HAROLD SENIER, F.C.S.

The paper is printed on p. 705, and gave rise to the following discussion:—

The President said that the paper was certainly an interesting one, because it appeared to point out a fact the reverse of what had been hitherto recognized; that was, that this drug seemed to improve in quality through being kept rather than to deteriorate. The general experience with drugs was in the opposite direction. It was a curious point that the oils which had been kept the longest yielded a larger proportion soluble in alcohol than recent oils, and it appeared that the portion soluble in alcohol was far more active than the insoluble. In fact, it would almost appear that the activity depended upon the proportion of the croton oil which was soluble in alcohol.

Professor Attfield asked Mr. Senier whether he had made, or intended to make, any experiments on the composition of the portion which was soluble in alcohol, as compared with the portion which was insoluble in alcohol. It would be interesting to know whether the more active part of the oil was the more highly elaborated, and whether the alteration that went on was due to chemical agency, such as oxidation, or whether it was a physical change.

The President observed that, as a general rule, oxidation meant degradation. In this instance it appeared that the oxidation had the reverse effect, and made the oil more active as a vesicant.

Mr. Postans said that Mr. Senier had stated that his experiments were all conducted with oils of British manufacture. He found that in two books of some standing it was stated that croton oil prepared by expression in this country was soluble in alcohol. Passing to the reference which Professor Attfield had made to the composition of the soluble and the insoluble portions, he (Mr. Postans) believed that Professor Tuson years ago experimented to some extent on croton oil, and his investigations led him to surmise that the isolated principle was somewhat analogous to cascarilline. Professor Tuson did not appear to have given any name to this substance, but he prepared it by treating the crushed seeds with continued portions of boiling water, and then evaporating the solution to an extract, and again treating the extract with boiling alcohol, evaporating it, and decolorizing with animal charcoal. Another gentleman who had investigated the subject spoke of crotonic acid, which was found on further investigation to be inert.

Mr. Cleaver said that it struck him that if croton oil was of the ordinary composition of an oil, namely, a compound of acid with glyceryl, rancidity might take place which would increase with age, and the acidity thereby produced might set free the natural acid of the oil, which would be more soluble than the oil itself.

Mr. Gerrard said that it frequently happened in hospitals that croton oil was prescribed in the usual minim doses, and it might be supposed that if the activity increased with age the variation would attract notice, but he had found no complaint, either of the increase or decrease of activity, though the specimen which was in use now at University College Hospital had been there to his knowledge five years. From the fact that physicians continued to prescribe the minim dose, he thought it might be inferred that age did not increase the activity of croton oil.

Professor REDWOOD said that he thought that it had long been considered that croton oil consisted principally of an oil of ordinary constitution, which was comparatively inert, if not entirely so, and that there was some principle contained dissolved in the oil to which the activity of it was to be ascribed. What the nature of that active constituent was was unknown. It was originally thought that the activity depended upon the presence of a certain body which was termed crotonic acid. He had had more than a little experience of croton oil for more than a quarter of a century. It must be about thirty years ago that croton oil was a subject which was very largely worked upon in that institution, and his friend Dr. Paul was then engaged with him in making experiments upon that substance From these experiments they first obtained their knowledge of the fact that croton oil, when pressed from seeds in this country, was perfectly soluble in alcohol. In these experiments it was indicated for the first time that the oil did not owe its efficacy in the slightest degree to the crotonic acid, this substance being found to be entirely medicinally inert. The experiments which had been made by Mr. Senier were certainly interesting in two or three points. Mr. Senier stated that croton oil at the present time, which was obtained by expression in this country, was not permanently soluble in alcohol. That result was entirely at variance with the results that were obtained by him (Professor Redwood) from a vast number of experiments which were made, and which were detailed by Dr. Pereira in a paper published in the *Pharmaceutical Journal*, and alluded to also in his work on Materia Medica. The experiments were made upon oil pressed on those premises within a few yards of the spot where the President was then sitting, and Dr. Paul was engaged in the expression of the oil. He should like to hear from Dr. Paul himself what was his idea as to the real source of the activity of croton oil, because in the process of grinding the seeds, in which Dr. Paul was engaged, an effect which was certainly a very unusual one, was produced upon Dr. Paul. The action was not in the usual direction. It was entirely different. Dr. Paul was suddenly found at the further end of the laboratory stretched upon his back upon the floor, in a perfectly insensible condition, and he remained in that condition for an hour or two. They thought that his case was a serious and a dangerous one, and probably it was, but after a time he recovered. Dr. Pereira, in his work upon Materia Medica, relates a very similar case which occurred in one of the docks to a man who was engaged in operating upon the seeds. This man suddenly fell down and remained insensible for several hours. He was sent to an hospital, and did not entirely recover until several days had elapsed. It was quite obvious, therefore, that, whilst on the one hand they might entirely eliminate crotonic acid from among the substances which gave activity to croton oil or croton seeds, they had yet to find out what the active principle was. As far as could be made out, the oil appeared to be merely the solvent of the active principle, and he thought that Mr. Harold Senier would have to carry his investigation further to show that what he had extracted by means of spirit consisted entirely of the active principle. He (Professor Redwood) should have liked to find that Mr. Senier had a little more strictly followed the course of proceeding which had been previously adopted of treating the oil with spirit. In all previous experiments in which it was treated with spirit or alcohol—for it was treated with both—an equal volume of alcohol was added to the oil, and all English pressed oils of which he (Professor Redwood) could get samples from any source during his experiments proved to be entirely and permanently soluble in an equal volume of alcohol, taking absolute alcohol and not rectified spirit. It remained soluble as long as the temperature of the air was about sixty degrees, but if it were put into a freezing mixture or the temperature was reduced to something approaching 32° Fahr., a separation took place. Mr. Warington in his last communication specified that he met with one sample of oil which reacted in the same manner. Mr. Senier appeared to have used a larger portion of spirit, having had five volumes of alcohol or spirit to one of oil. That might affect the result, for he (Professor Redwood) knew from experience in the case of vegetable extractive matter that such matter might be perfectly soluble in a small quantity of water and yet insoluble in a large. That fact must be familiar to those who had had any experience in the preparation of concentrated extracts, therefore he felt that it was quite possible that in the case of croton oil a smaller amount of spirit might exert a more powerful and more complete solvent action upon the oil than a larger quantity. However, as he had said before, the first point of interest in the paper was that whereas previously all the oil pressed in this country had proved to be perfectly soluble in alcohol, the English pressed oils which Mr. Senier had operated upon had not proved to be. The question arose, "What can be the reason of this?" At the time his (Professor Redwood's) experiments were made he found that all foreign pressed oil reacted just as Mr. Senier had found the English pressed oil to react. A separation took place. The oil might be miscible or soluble upon the application of a little heat, but when it was cooled down to about 60° or 65° F., a separation took place. Dr. Pereira originally suggested that in all probability the difference was due either to some alteration which the oil itself underwent, or to some change which the seeds underwent. In his (Professor Redwood's) opinion, it was not due to an alteration which the oil underwent, for he had found, as Mr. Gerrard had found, that he could keep a sample of foreign oil—East Indian croton oil—for years without its degree of solubility increasing. At the time of his experiment thirty years ago there was in the market a large quantity of seeds, some which had been in stock for some time and therefore might have undergone that kind of change which caused an oil to be extracted from them to contain a large quantity of the active principle which rendered the oil soluble in spirit, whereas all the oil pressed in India would be much more likely to be pressed from fresh seeds which had not undergone the change. That seemed to be the most rational explanation. It appeared to him that the most important and interesting part of Mr. Senier's communication was the latter part, where he alluded to the mode of getting in a more concentrated condition the active matter of the seed.

Professor BENTLEY said that he should like to ask Mr. Senier whether he was familiar with the experiments made by Schlippe upon the composition of croton oil. Schlippe showed that croton oil was composed of fixed oil, crotonic acid, tiglinic acid, and a dark brown oil which he termed crotonol. This latter substance might be the principle which Mr. Senier had described that evening. At all events it was one which was worth Mr. Senier's attention. This brown oil, so far as he (Professor Bentley) knew, had never been isolated by any other chemist. Schlippe further described this principle as the vesicating principle of croton oil. Mr. Senier in his paper said, "From the above experiments it may reasonably be concluded that for medicinal and pharmaceutical purposes, an oil extracted by alcohol would be a more satisfactory preparation than the crude oil." He (Professor Bentley) did not think that this necessarily followed from Mr. Senier's experiments. The experiments were perfectly clear so far as the vesicating principle was concerned, but it did not naturally follow that the purgative principle was the same as the vesicating principle. Schlippe laid no claim to crotonol being the purgative principle. He (Professor Bentley) could entirely corroborate what had been said by his colleague, Professor Redwood, about the purgative principle, which had not as yet been isolated. It would seem probable that there would be found to be both a vesicating principle and a purgative principle in croton oil. Mr. Senier's paper raised many interesting points. For instance it would be interesting to pursue a similar investigation with regard to castor oil, which was in some degree connected with this subject. What was the purgative principle of castor oil? It was said to be an acrid resinous substance, but it had never been isolated. It was well known that castor oil which was extracted from the seeds by alcohol was much more active than that expressed from the seeds, and that fact bore somewhat upon the experiments of Mr. Senier. The whole subject with regard to the therapeutic effects of croton oil and castor oil and their active principles was one which he ventured to commend to Mr. Senier for further investigation.

Mr. UMNEY said that some thirty years ago, the time to which Dr. Redwood had alluded, croton oil was pressed in certainly more than one laboratory in London, but at the present time all the croton oil of Great Britain was pressed by one firm only. All the croton oil of the country might be traced to that one source. No other firm would press the seeds. He made this remark so that persons should not suppose that croton oil at the present day varied in quality through coming from different sources.

Dr. PAUL said that he had a very lively recollection of the fact to which Professor Redwood had alluded. He did not remember much in connection with these experiments, as he was but a student at the time, but he had a very distinct recollection that the effects produced upon him by the seeds were more like the effects of a narcotic than of anything else, and were not accompanied with any of the purgative or irritating effects which were common to croton oil.

Mr. E. M. HOLMES said that in Hanbury's 'Pharmacographia' he had observed a remark which might throw a little light upon the subject, It was, "The solubility of the oil in alcohol, sp. gr. 0·974, appears to depend in great measure upon the age of the oil, and the greater or less freshness of the seeds from which it was expressed, oxidized or resinified oil dissolving the most readily." If this were the case, the oil might become resinified or oxidized in old seeds or in oil which had been kept for some time, and thus a larger amount would be found to be soluble in older specimens of the oil. The remark which he had quoted from 'Pharmacographia' would also bear out Mr. Gerrard's suggestion. Mr. Gerrard seemed inclined to think that although the portion soluble in alcohol might increase in quantity by age, the oil did not increase in strength by keeping. If the increase of the soluble portion was due to the production of resinified oil, it would not necessarily follow that the oil would be more purgative. With regard to the case of the man at the docks to which Professor Redwood had referred, he (Mr. Holmes) imagined that the seeds at the dock were entire, not crushed seeds, and that the effect produced upon the man was probably due to the irritating principle contained in the coat of the seed. In handling croton seeds he had frequently noticed that the powder which arose from the seeds being rubbed together was exceedingly irritating to the nostrils. He would suggest that there should be a separate investigation of the coats of the seed, and of the kernels. He should be glad to learn whether in Professor Redwood's experiments absolute alcohol was used.

Professor REDWOOD: Absolute alcohol.

Mr. SENIER in reply said that he used absolute alcohol of a specific gravity of about ·794. In reply to Professor Attfield he had to say that experiments on the point which he mentioned were still in progress, and he proposed to include the result in another paper. Mr. Cleaver had suggested the possibility of the change of the solubility being due to the oil having become rancid, and the fact that an acid was liberated. He might say that the oils which he examined were perfectly neutral to test paper. In reply to Mr. Gerrard he might remind them that in the paper he did not say that the activity of the oil was increased by age. He merely said that the quantity dissolved in alcohol increased by age. He should like to ask Professor Redwood whether, in the experiments he mentioned, heat was not used when the oil was mixed with the alcohol.

Professor REDWOOD said that no heat was used in the experiments with English pressed oil. It dissolved instantly upon mixing the two together in equal volumes. He could not recollect whether the experiments were made in the summer or in the winter, but he knew, although oil dissolved readily in alcohol without the application of heat, separation took place when the oil was cooled down to between 30° and 40°. The mixture was kept for some months at an ordinary temperature without any separation occurring.

Mr. SENIER said that all his experiments wer conducted at a temperature of between 50 and 60 degrees. In reply to Professor Bentley he might say that he had seen the experiments that he alluded to with regard to croton oil. He had also seen the statement in Watts's Dictionary that nobody but the first discoverer had ever succeeded in isolating the active principle. He had tried the experiment, however, with one of the samples, but obtained no crotonol. He thanked him for his kind suggestions as to future investigations, and he would endeavour to follow out some of them.

A paper was then read upon—

DUBOISIA MYOPOROIDES, *R. Br.*

BY THE CURATOR.

The paper is printed on p. 705, and gave rise to the following discussion.

The PRESIDENT said that the communication was a most interesting one. He supposed that they might gather that the alkaloid had not been isolated. If it was true that the plant could be obtained in abundance, and that it yielded an alkaloid of the nature of atropine, but more abundantly, then the fact was a very important one. As far as the results obtained by the medical men had gone the product seemed to be very satisfactory; but they must not be too sanguine about it, for they knew that every remedy was very much praised when it first appeared.

Mr. HOLMES, in reply to a question put by the President, stated that he believed that the plant was plentiful in Australia. In this country there were at present a few pounds of the extract which Dr. Bancroft had brought over with him.

Mr. GERRARD said that the extract of Duboisia which had been used at the University College Hospital did not appear to him to be a first class pharmaceutical preparation, and that with a really good preparation probably better results might be obtained. He might say that it had the appearance of a partly resinous and a partly watery extract. It was very acid, so that it was likely to be irritating. The extract which he had used he had received from Mr. Tweedie.

The PRESIDENT said that his own experience was that extracts made in this country from imported plants were generally better than extracts made in hot climates by the natives, and particularly those made in India.

Professor BENTLEY said that the subject was one of very considerable interest, for the plant appeared to be one which could be got in any quantity. They were waiting to hear the results of Dr. Ringer's experiments, and the matter could not be in better hands.

The PRESIDENT announced that the next meeting—the last for the session—would take place on Wednesday, 3rd April.

EXAMINATIONS IN EDINBURGH.

Present—Mr. Williams, President; Messrs. Ainslie, Borland, Gilmour, Kemp, Kinninmont, Stephenson and Young.

Messrs. Sandford, Corder, Moss, Taylor and Richard Bremridge were present as a deputation from London.

Professor Maclagan was also present on behalf of the Privy Council.

MAJOR EXAMINATION.

One candidate was examined, but failed to pass.

MINOR EXAMINATION.

Twelve candidates were examined. *Seven* failed. The following *five* passed, and were declared qualified to be registered as Chemists and Druggists:—

Billing, Charles ....Edinburgh.
Murdoch, James William Aitkin Dumfries.
Richards, John Wesley ....Saltburn-by-the-Sea.
Russell, William ....Aberdeen.
Watt, George William............Huntly.

MODIFIED EXAMINATION.

One candidate was examined, but failed to pass.

PRELIMINARY EXAMINATION.

The undermentioned certificate was received in lieu of the Society's Examination:—

Certificate of the University of Durham.

Lovegrove, Charles ....Liverpool.

Provincial Transactions.

HULL CHEMISTS' ASSOCIATION.

The fifth meeting of the session of this society was held at the Cross Keys Hotel, Market Place, on Thursday evening the 21st ult., the President, Mr. C. B. Bell, occupying the chair. The minutes of the previous meeting having been read and approved, the president drew the attention of the members to the Dental Practitioners' Bill, now before parliament. After some discussion had taken place upon this Bill, votes of thanks were unanimously accorded to the Pharmaceutical Conference for the 'Year-Book of Pharmacy' for 1877; and to the "Sanitas" Company for samples and specimens of their manufactures. The President then called upon Mr. Baynes, F.C.S., F.R.M.S., etc., borough analyst, to deliver his lecture on Disinfectants.

Mr. Baynes commenced by observing that most ridiculous statements had been made and believed concerning the chemistry of disinfectants, and then proceeded to describe the composition of organic matter, and the several conditions requisite for the putrefactive process, enumerating the noxious gases emanating from decomposing matter. He next explained the meaning of the words disinfectant and antiseptic, and noticed the following natural and artificial disinfectants, soil, air, heat, cold, the manganates and permanganates, nitric acid, chlorine, sulphur, lime, carbolic acid, etc., stating that the great value of the air as a disinfectant was apparently due to ozone.

After alluding to infection, Mr. Baynes drew the attention of the members to samples of the new disinfectant "Sanitas," and stated his belief that it was the most perfect disinfectant, antiseptic and deodorizer, and concluded by describing the origin and process of its manufacture.

On the motion of Mr. J. F. Smith, seconded by Mr. Oldham and supported by the president, a cordial vote of thanks was awarded to Mr. Baynes for his very valuable and interesting paper.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The usual monthly meeting of this Association was held at Britannia Chambers, Pelham Street, on Wednesday evening, February 20, 1878. The chair was occupied by the Treasurer, Mr. J. Rayner, and there was a large attendance of members and associates.

The minutes of the last meeting were read and confirmed and a new member elected, after which the Honorary Secretary announced that he had received the *Pharmaceutical Journal* regularly since the last meeting, that he had received the 'Year-Book of Pharmacy," from Professor Attfield, and a donation of five guineas from Messrs. Langton, Harker and Stagg, of London. On the motion of the chairman a hearty vote of thanks was awarded to the respective donors.

The chairman then introduced Mr. H. Major, B.A., B.Sc., F.R.G.S., who delivered a most interesting lecture on Germs, which was listened to with great attention and loudly applauded at the close.

Mr. R. Jackson proposed a vote of thanks to Mr. Major for the very eloquent and instructive lecture he had delivered, which was seconded by Mr. Parker and carried unanimously.

Proceedings of Scientific Societies.

PARIS SOCIÉTÉ DE PHARMACIE.

New Medicines and Preparations.—At a meeting of this Society held on the 9th of January, under the presidence of M. Méhu, the subject of new remedies was discussed on the receipt of a letter from a provincial society expressing its thanks for the report recently issued (which has appeared in this Journal), and suggesting other preparations for which formulæ might with advantage be authorized. On the proposition of M. Baudrimont it was decided to appoint a permanent commission whose duty it should be to receive and examine all propositions relating to new medicines and new formulæ, and to report upon them to the Society. The members of this commission are Messrs. Schaeuffèle, Lefort, Desnoix Marais, Duquesnel and Petit, and the first business referred to it was a proposal to substitute *eau sucrée* for dilute alcohol in the Codex formula for cinchona wine, macerating with heat before adding the wine, and a proposal for a modification of the formula of syrup of bitter orange peel.

Cremocarpus setigerus.—M. Martin presented a specimen collected in California of this Euphorbiaceous plant, which resembles the crotons. It yields a hydrolate, having an odour recalling that of a goat. To carbon bisulphide it gives up a brown fatty matter, having the same odour, and to alcohol a very hygroscopic extractive which is very bitter and acrid to the taste.

Salts of Cinchona Alkaloids.—M. Petit presented to the Society specimens of acid hydrobromate of quinine and acid hydrobromate of quinidine which he had prepared. The composition of these salts, which M. Petit proposes to study more closely, appears to be one equivalent of base, two of acid, and four of water. M. Petit also referred to the neutral sulphate of quinidine, at present occurring rather abundantly in the market. He had examined two samples, one from London, the other from Val-de-Grace. They were exactly similar in respect to their rotatory power, and upon heating them in a stove to 100°, the loss of weight in neither case exceeded 0·5 per cent. He therefore concludes that neutral sulphate of quinidine does not contain water of crystallization.

CHEMISTS AND DRUGGISTS' TRADE ASSOCIATION.

A meeting of the members of the deputation appointed by the Executive Committee to wait upon one or more of the promoters of the Dental Practitioners' Bill, with a view to amend the same, was held at the Inns of Court Hotel, High Holborn, London, W.C., on February 28, 1878, at 2.30 p.m. Mr. S. U. Jones, President, in the chair.

Present—Messrs. Andrews, Greenish, and the Solicitor of the Association.

A letter was read from Mr. Hampson regretting his inability to attend the meeting or accompany the deputation.

The Secretary reported having corresponded with Sir John Lubbock, M.P., the principal promoter of the Dental Practitioners' Bill, and that he had consented to receive the deputation at the House of Commons on that day at 4 p.m.

Considerable discussion took place on those parts of the Bill affecting the interests of the trade and on the alterations to be suggested to the promoters of the same.

The deputation then proceeded to the House of Commons. The Secretary having introduced the members of the deputation to Sir John Lubbock,

Mr. S. U. Jones said there appeared to be several clauses in the Dental Practitioners' Bill, of which the honourable gentleman was the principal promoter, that were hostile to the interests of chemists and druggists, and that the deputation of which he had the honour of being a member was appointed by the Executive Committee of the Chemists and Druggists' Trade Association of Great Britain to wait on the gentlemen who had charge of the Bill, with a view to suggest some important modifications in the objectionable clauses. It would appear from a careful perusal of the Bill that, if passed into law, it would prevent all those chemists and druggists who were at that time practising dentistry from continuing to do so, or at all events from recovering "any fee or charge in any court, for the performance of any dental operation," unless they obtained their registration under the Act, for which there seemed to be no provision in the Bill ; on the contrary they were by the fifth clause debarred from registration, not being "licentiates in dental surgery or dentistry of any Royal College of Surgeons in the United Kingdom, or of the Faculty of Physicians and Surgeons of Glasgow ; or at the passing of that Act *bonâ fide* engaged in the practice of dentistry, either separately or in conjunction with the practice of medicine or surgery." This prohibition would be very severely felt by many of Her Majesty's poorer subjects throughout the kingdom, and it would be a source of great inconvenience to all classes of the public residing in country districts where no professional dentist was to be found. He would suggest to the honourable gentleman the desirability of amending the fifth clause, by the addition of the following words to subsection (*a*), "any duly registered pharmaceutical chemist or chemist and druggist practising dentistry at the time of the passing of this Act," or, if this was a concession that could not be granted, the addition to subsection (*b*) of the words, "or the business of a chemist and druggist;" in either case placing these words at the termination of the sentences. He would next direct the attention of the honourable gentleman to the seventh clause, which provided that "No name shall be entered in a register under this Act except of persons authorized by this Act to be registered, nor unless a registrar be satisfied by sufficient evidence that the person claiming is entitled to be registered." It appeared to be a very open question what would be deemed by the registrar "sufficient evidence" for this purpose. He thought too much power was being placed in the hands of the registrar; of course by a further provision in the same clause any person whom the registrar refused to register could appeal against this decision to the General Council, but it would be an exceedingly inconvenient and expensive recourse for gentlemen residing at some distance from London, and he would suggest that this power to veto registration should not be placed in the hands of a registrar, but that a clear definition of the meaning of the words being "*bonâ fide* engaged in the practice of dentistry" should be appended to the declaration contained in the schedule to the Bill, and that an attested declaration from persons claiming registration should be deemed sufficient evidence that they were "practising dentistry at the date of the passing of the Act," and entitle them to be registered under the Act.

The Solicitor said he thought it a very important matter that the term "practising dentistry" should be clearly defined in the Bill, and pointed out that in the absence of explanation litigation would probably ensue. He also, alluding to the 13th section, said as there were powers given in the Bill for the appointment of examining boards it should not be compulsory for persons seeking registration by passing the examinations to walk hospitals, or attend several courses of lectures in London, as was necessary for obtaining the degree of licentiate in dental surgery; the proper test, he urged, would be the candidate's fitness to perform dental operations, no matter where or by what means he gained such knowledge.

Mr. Andrews referred to the vested rights of chemists and druggists in the practice of dentistry, and said there were very many members of the trade, particularly in country districts, who practised somewhat extensively. It appeared to him, and he hoped it would appear to the honourable gentleman also, that such interests should be respected and protected; it was usual he thought in Bills of the kind they were discussing to preserve the rights of persons practising at the time.

Sir John Lubbock said he was much obliged to the members of the deputation for their kindness in coming there. He would very carefully consider the points referred to, and talk them over with Sir Philip Egerton, Mr. Tomes, and the medical gentlemen under whose direction the Bill was prepared. He should like to say it was not the intention of that Bill to interfere with such simple operations as extracting or stopping teeth, which did not require any extended period of study, being performed by chemists ; certain things were allowed and no penalties were attached, yet they were to be discouraged. The object of the Bill was not to prevent such simple operations as he had referred to being performed upon any one who liked to submit himself to the same, but to prevent a person holding himself out to the public as being especially qualified as a dentist when he was not so qualified; although, by the provision of the Bill, no unregistered person would be entitled to recover any fee or charge by legal action, the same did not prevent an unregistered person asking a fee or obtaining it. If they were to amend the schedule containing the blank form of declaration, as suggested by Mr. Jones, they might modify clause 7, but it had not occurred to him that any difficulty would arise on that point, a registrar refusing to register qualified persons would be liable to legal proceedings ; but he saw a little difficulty about a person being in a position to satisfy the registrar that he was entitled to be registered, and they would consider that question and see if the promoters of the Bill could in any way remove the difficulty. With reference to the question of vested interests he was quite disposed to go with the deputation. It was a very reasonable point and he thought subsection 6, clause 3, should be modified.

The Secretary said he was pleased to hear from the honourable gentleman that he was prepared to recognize and protect the vested interests of the trade in amending the Bill before them, and that it was not the intention of the promoters of the Bill to prevent chemists and druggists extracting or stopping teeth, but he should like to direct the honourable gentleman's attention to a portion of the third clause which if passed into law would preclude a chemist from publicly informing his customers—the public—that he did perform such operations. This clause provided that a person may not use the name or title of dentist either alone or in combination with any other word or words "or any name, title, addition, or description implying that he is especially qualified to practise dentistry unless he is registered under this Act," under penalty of a sum not exceeding £20, so that any chemist and druggist exposing the words "Teeth Extracted" or "Teeth Stopped" on labels, placards, brass plates, etc., would be liable to this penalty, as he would thereby clearly use a "description" implying that he was especially qualified to extract and stop teeth. It seemed an anomaly for a person to be permitted to do certain things, while if he explained to the public that he did them he rendered himself liable to a heavy penalty, and he would submit to the honourable gentleman the advisability of modifying that clause.

Sir John Lubbock said he would make a memorandum on the subject and he should be disposed to erase the words "addition or description" from the third clause, which would remove the objection.

The Secretary inquired if the members of the deputation may be assured that the honourable gentleman would so modify the Bill as to carefully protect the vested interests of chemists and druggists in the practice of dentistry.

Sir John Lubbock assented.

Mr. S. U. Jones then thanked the honourable gentleman for his kindness in receiving the deputation and for the concessions promised.

UNIVERSITY OF EDINBURGH CHEMICAL SOCIETY.

The sixth meeting of the Edinburgh University Chemical Society for session 1877–1878, was held on February 27, Mr. Inglis Clark, B.Sc., in the chair.

A paper on "Electrolysis" was read by R. M. Morrison, D.Sc., Chemical Demonstrator of the University, in which he traced the history of electrolysis down to the present time, showing that as recently as 1840 the art was practically in its infancy; and that at the present day it was in numberless ways made use of. The chief points of theoretical and practical interest were dwelt on, both with regard to the various metals which could practically be used, and to the solvents from which the best results were attainable.

THE LONDON CHEMISTS' ASSISTANTS' ASSOCIATION.

On the evening of Wednesday the 27th February, a most successful *soirée* was held in connection with the above Association, at 28, Baker Street, W., in rooms kindly lent for the occasion by the Council of the Quebec Institute.

Notwithstanding the unfavourable weather upwards of 300 ladies and gentlemen were present.

There was an exhibition of microscopes by Mr. Crouch of Barbican; graphoscopes and revolving stereoscopes by the London Stereoscopic Company, Regent Street; raw chemicals lent by Messrs. Hopkin and Williams, and Mr. S. Lloyd Bullock; Materia Medica specimens lent by the Council of the Pharmaceutical Society; telephones (connecting two rooms), and a fine collection of drawings, photographs, and water-colours, lent by Mr. Stuart; model of the ear, lent by Dr. J. S. Stocker; a case of terebene preparations, lent by Messrs. F. S. Cleaver and Sons; several powerful galvanic batteries, lent by Messrs. S. Maw, Son, and Thompson. Views were shown at intervals by a dissolving view apparatus from the Royal Polytechnic Institution.

After tea the guests were entertained by several members of the Association and others, with pianoforte and violin solos, spirited recitations and songs.

The entertainment throughout the evening was of an interesting character, and the friends of the Association appeared unanimously to wish that the *soirée*, which proved so successful, might become an annual event.

At the close of the meeting the President, Mr. P. Princep, made a few appropriate remarks, and proposed a vote of thanks to the Council of the Quebec Institute for the use of the rooms, and to all friends who, by exhibits or personal exertions, had assisted to render the evening so successful. The singing of the National Anthem then closed the evening's entertainment.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held at 17, Bloomsbury Square, on Thursday, Feb. 28, when a note on "Some of the Substances employed in Perfumery," was read by Mr. C. J. Mead. The paper gave an interesting account of some of the principal substances used in the manufacture of perfumery.

The reading of this paper was followed by a note on "Blatta orientalis, its use and preparation" by Mr. J. Hart. The author first announced that the "new drug" was a very old acquaintance, the common "black beetle," and followed this statement by a description of the insect. The therapeutic action was diuretic and it was supposed to be of special value in Bright's disease. The usual method of administration was in the form of a tincture prepared by macerating half-a-pound of beetles in a pint of rectified spirit and filtering. The resulting clear liquid was of a yellowish colour, and became opalescent by the addition of water. Its taste was not in any way disagreable, as could be proved from the sample Mr. Hart exhibited.

Both papers were followed by discussions, and votes of thanks awarded to the authors, after which the meeting was adjourned till March 14.

Dispensing Memoranda.

[72]. May I suggest to Mr. R. Turner that I always find ♏iij., of the oil sufficient, rubbed up with the dry powders, and then add as an excipient a little Ext. Gent., firm pills are thus made, having the advantage of being small.—J. C. Culfe, *Ipswich.*

[72]. A few drops of mucilage of acacia will make a very convenient mass for rolling, and not cause any increase in size.—J. De Carle.

[73]. Suggests its own mode of mixing, as I conceive there is little dispensing acumen required in its composition, the ingredients can only be temporarily suspended in the liquid by shaking and as quickly swallowed.
J. De Carle.

[74]. In answer to this query, I should, if practicable, communicate with the writer prior to dispensing the prescription; if that was not feasible, I should have dispensed it as follows:—

℞	Tinct. Nucis Vomicæ.	℥iss.
	Pepsinæ Porci	ʒiv.
	Acid. Nitromur. dil.	ʒiij.
	Acid. Hydrocyanic. P.B.	ʒiss.
	Liquor. Bismuthi	℥ij.
	Aquæ	ad ℥xl.

℥j. ter die statim post cibos sd.

I think it is quite evident there is an omission of the aqua.—Dyspepsia.

[75]. A few drops of alcohol should bring this mass into subjection, only that the Bals. Peruv. is given in excess.—J. De Carle.

[76]. Will you kindly favour me with your opinion as to the correct method of dispensing the following prescription?

Copy.

℞	Sodæ Bibor.	℥ss.
	Glycerini	q.s.
	Aq. Destill.	Oss.

Ft. Lotio.

The method I employed was to add sufficient glycerine to the borax to dissolve it, and then to fill up to ℥x. with aq. dest., but as the lotion develops a fungoid growth after keeping a week, the patient concludes it is not prepared correctly.—Alex. Courtenay.

Notes and Queries.

[577]. A WATER QUERY.—I think there is no reason to change a leaden pump for a cast iron one with a copper sheath, as the copper by its combination with the ingredients of well water is still more objectionable.

M. Fordos was unable to find the slightest traces of lead in 10 litres of river water taken from the reservoir in the Pharmacie de la Charité à Paris.

The bicarbonate of lime, carbonic acid, and sulphate of lime contained in the water will cover the walls of the leaden pump with carbonate and sulphate of lead, and both being insoluble in water a contamination cannot happen.*

According to Raland, carbonate of lead produced through the bicarbonate of lime contained in nearly every spring water can, if in fine powder, be suspended in such a way that it will even pass through an ordinary filter. Treated with sulphuretted hydrogen it certainly blackens but being so finely divided is nearly invisible. If to the water are added a few drops of a solution of tartrate of ammonia, the insoluble hydrate, sulphate, carbonate, phosphate, etc., of lead will be dissolved and the reaction of sulphuretted hydrogen easily perceived, as I found out in repeating the test in my laboratory.

H. W. LANGBECK.

* A contamination of water with lead can only happen in presence of nitric or nitrous acid combined with ammonia which acts in the same way as tartrate of ammonia.

Obituary.

Notice has been received of the death of the following:—

On the 24th of February, 1878, Mr. Peter Carter Yarrington, Chemist and Druggist, East Dereham, Norfolk. Aged 34 years.

On the 26th of February, 1878, Mr. Charles Service, Chemist and Druggist, South Lambeth Road. Aged 76 years.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE PRELIMINARY EXAMINATION.

Sir,—In your last issue I noticed a letter from a correspondent, residing at Stirling, complaining of the great percentage of failures in the above examination, and attributing it either to the deterioration of the candidates or the stringency of the qualifying test, particularly as regards the metric system; but having recently passed the examination I should like a short space in your valuable Journal to express my opinion on the subject.

Firstly, as regards deterioration. The percentage of failures has no doubt greatly increased since so many chemists have taken as apprentices mechanics' sons and errand boys (knowing several instances myself), who have received a very limited education, and in some cases scarcely any at all, and after being a few months in the trade they are persuaded to present themselves for examination, and the result is that 90 per cent. fail to obtain the number of marks required to pass.

Secondly, "As to its stringency." The subjects of the qualifying test (the metric system excluded) are simple enough for any respectable youth leaving school to pass, and the questions given on the metric system being only elementary, could be easily learnt by the candidate with a fortnight's extra study before presenting himself. The Act was passed to get a better qualified class of men to bear the great responsibilities connected with the trade, and I do not think it would be just to the public at large, or to those who have already passed their examinations, to lower the standard in any way whatever, as by so doing greater facilities would be offered to the lower classes to enter the trade, and since so many grocers and co-operative stores are selling drugs and patents at such cutting prices, I do think the best motto for those now in business is "The fewer the better."

A PRELIMINARY STUDENT.

March 2, 1878.

THE DISCREPANCY IN EXAMINATION RESULTS.

Sir,—I must beg of you to spare me a small space in your Journal wherein to criticize the letter which appeared in this week's issue, from Mr. Mackay.

Whilst congratulating the North British Branch of the Pharmaceutical Society of Great Britain in general, and the Examining Board of the aforesaid North British Branch of the Pharmaceutical Society of Great Britain in particular, on the fact of having Mr. J. B. L. Mackay to "assume the defensive" on their behalf, I scarcely think he is justified by recent events in assuming the superiority of the "Brachychephalæ" over the "Dolichocephalæ." Taking the last Preliminary examination pass list as a criterion of the respective capabilities of the North and South Britons (and to this Mr. Mackay cannot surely take exception, as it is a "written," and undoubtedly "fair" examination), I find that whilst 40·6 per cent. of those who presented themselves at the English centres passed only 26·2 per cent. of the candidates presenting themselves at the Scotch centres (presumably Brachycephalæ) came unscathed from the ordeal.

These figures certainly do not bear out the insinuations of Mr. Mackay, and I believe that were it possible to analyse the pass lists of the North British Branch in reference to the Minor examination (first deducting the despised Dolichocephalæ, who prefer to try their fortune at what is generally supposed to be the more lenient Board, and who help to swell the North British percentage of successful candidates), we should find little, if any, difference in the results.

That the Edinburgh Board has the credit of more easily passing candidates there can be no doubt; at any rate such was the case seven or eight years ago when I was myself a student, and that the same idea still exists seems borne out by the fact that such large numbers of candidates go from England to that Board. Thus at the December examination (Minor) no less than half the successful candidates hailed from this side the Tweed. I fancy Mr. Mackay will have to examine the London pass lists some time ere he will find many of his northern friends figuring therein. They either prefer facing the Edinburgh Board, or if they do present themselves in London—well the less said about the greater cerebral development of the Brachycephalæ the better.

In reference to the abolition of oral examinations, I do not see how the capabilities of candidates in such subjects as dispensing, pharmacy, and reading prescriptions can be properly gauged by any other means, though I quite agree with Mr. Mackay that, where possible, a written examination places candidates on more equal terms.

E. H. S.

London.

T. C. Thompson.—*Pulmonaria officinalis.*

W. M.—The following is from Wilson's 'Skin Diseases,' and is probably what you require :—

℞	Olei Amygdalæ Dulcis	℥j.
	Liq. Ammoniæ Fort.	℥j.
	Sp. Rosmarini	℥iv.
	Aquæ Mellis	℥ij.

Misce. Fiat lotio.

Cymro.—If your property is illegally detained we should advise you to consult a solicitor.

J. P. H. is recommended to consult a work on dentistry.

E. Lloyd.—The objectionable tint is probably due to ultramarine, added to conceal the bad colour of the sugar.

W. D.—See a paper on the Preparation of Glycerine Jelly in vol. v., p. 401, of the present series of this Journal.

"*Cera Alb.*" who is requested in future communications to send his name and address, is referred to the advice given in our answer to him on p. 704.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Symons, Mr. Pittendrift, Mr. Williams, Mr. Footit, Mr. Elton, Mr. Fitch, Mr. Powler, Plymo, Student, Caledonian.

NOTE ON A CRYSTALLIZABLE INDIFFERENT RESIN OF GURJUN BALSAM, AN ADDITION TO THE 'PHARMACOGRAPHIA.'*

BY PROFESSOR FLÜCKIGER.

In the 'Pharmacographia,' p. 204, it is stated that copaivic acid is by no means an abundant and common constituent of copaiba. The only kind of that balsam I have ever met with, which readily yields crystallized acid is that mentioned in the said book. The drug alluded to was contributed from Trinidad to the London Exhibition of 1851. The crystals before me are of decidedly acid reaction on litmus paper. I have recently again examined several varieties of copaiba, but have not been successful in obtaining copaivic acid from them. At the same time I prepared the essential oils from them and was astonished to find them all levogyre, although I had submitted to distillation not only levogyre varieties of the balsam, but also strongly dextrogyre ones. I must say in fact (see 'Pharmacographia,' 204), that I have as yet not met with an *oil* of copaiba deviating to the right.

Some time ago I noticed in the price list of Gehe's and Co., Dresden, "crystallized copaivic acid." On applying for it, and at the same time for the very balsam from which it had been extracted, I was at once informed that the material by which the acid had been afforded was "East Indian copaiba." The balsam sent, together with the crystals, proved indeed to be Balsamum Dipterocarpi, as described by Hanbury and myself in 'Pharmacographia,' 81. I therefore supposed the crystals sent by Gehe and Co. to agree with gurjunic acid, but found them to be devoid of acid character. They were slightly yellowish and undoubtedly crystalline, and soluble, although not precisely in abundance, in the usual solvents for resins. Among them I found petroleum spirit, boiling at about 80° C., the most suitable for purifying the crystals. If they are dissolved in about twelve parts of that liquid, tolerably well-formed crystals, thin prisms—sometimes as long as two-fifths of an inch—are obtained by exposing the solution to cold. I have not been able to get finer crystals, either by evaporation of the petroleum spirit solution, or by using alcohol.

The purest, perfectly transparent, and colourless crystals of the best crops, begin to melt at 126° C. without diminishing their weight; they are in fact anhydrous; somewhat more considerable quantities cannot be perfectly liquefied before reaching 130°. Gurjunic acid,† according to Werner (*Zeitschrift für Chemie*, 1862, 588), melts at 220°. The resin under notice, as purified by me, after it has been melted, forms an amorphous mass, reassuming immediately the crystalline form as soon as it is slightly touched with alcohol. By heating the crystallized resin in a platinum capsule it is partly volatilized, and evolves the same odour as is given off by heated colophony—partly it is charred, the small amount of charcoal being easily burnt away.

The crystallized resin is not dissolved even by boiling caustic lye, nor does it possess an acid reaction on litmus paper; it is in no way capable of yielding any compound with basic substances. Its saturated solution in petroleum spirit displays no rotatory power on polarized light.

It forms an orange solution with concentrated sulphuric acid, becoming decolorized and turbid on addition of water. If submitted to destructive distillation an acid oily liquid of a rather agreeable odour is produced. By using potash the resin under notice is not much altered, nor by heating it with anhydride of acetic acid.

Submitted to ultimate analysis by Dr. Buri, in my laboratory, the resin in burning yielded:—

	I.	II.	III.
	0,2476	0,2354	0,2492
CO_2 . . .	0,7369	0,6996	0,7419
OH_2 . . .	0,2535	0,2410	0,2557

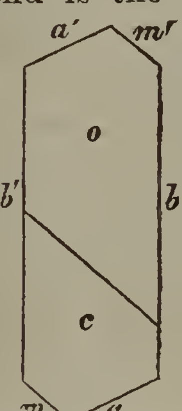
Answering in percentages—

C	81,16	81,05	81,16
H	11,38	11,37	11,40
O	7,46	7,58	7,40

The formula $C_{28}H_{46}O_2$ would require:—

28 C	336	81,16
46 H	46	11,11
2 O	32	7,73
		100,00

The crystallographic character of the resin has been examined and carefully described by Dr. Bücking, in Professor Groth's 'Zeitschrift für Krystallographie,' Liepzig, 1877, 389. The crystals belong to the asymmetric system. They are long prisms (the horizontal section of which is represented in the accompanying figure), formed by the reflecting surfaces *a b m*, and truncated towards *b*. At the end is the sharply inclined face *o*, also reflecting, and a nearly horizontal face *c*, which is always so uneven that not even an approximate measurement can be made. Consequently the relation of the axes could not be calculated. The angles observed were as follows:—



$a : b = 66° 58'$.
$a : m = 65° 54'$.
$b : m = 47° 8'$.
$o : a = 57° 6'$.
$o : b = 79° 20'$.
$o : m = 46° 51'$.

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* Translated from the *Archiv der Pharmacie*, February, 1878.

† It is called "gurgunic acid" in the German books, owing no doubt, to a misprint, for I am not aware that in India they ever write "gurgun balsam" but alway "gurjun," although I am unable to say what this word signifies.

THE TURPENTINES AND RESINOUS PRODUCTS OF THE CONIFERÆ.

BY DR. JULIUS MOREL,

Professor of Chemistry in the Industrial School, Ghent.

(*Continued from page* 545.)

Distinguishing Characters of Commercial Oils of Turpentine.—The volatile oil extracted from turpentine not only varies with different species, but the oil yielded by the different parts of the same plant is variable, the boiling point varies between 152° and 172° C., and the specific gravity at the ordinary temperature between 0·856 and 0·870. This difference is especially manifest in the optical properties, the oil rotating the plane of polarized to the right or to the left and also in varying degree. The odour also differs according to the species that has yielded the oil.

The properties of oil of turpentine described above apply to the common variety (from *Pinus maritima*, etc.), and I shall now proceed to pass in review the principal characters of the other oils extracted from the different turpentines that have been described.

Oil of Venice Turpentine (from *Larix Europœa*) boils at 157° C., and rotates the plane of polarized light 6·4° to the left. Venice turpentine contains 15 per cent. of this oil.

Oil of Canada Turpentine (*Abies balsamea*) obtained, according to Flückiger and Hanbury, by the distillation of that turpentine with water, is colourless and presents rather the odour of common turpentine than the pleasant smell of Canada balsam. Besides the body of the composition $C_{10}H_{16}$ it contains a very small quantity of an oxygenated compound, the presence of which can be demonstrated by the evolution of hydrogen, when a fragment of metallic sodium is added to it, care being taken previously to remove any water that might be present by distillation of the oil over fused calcium chloride.

The distillation of the oil commences at 100° C., but the greater part does not distil until about 170° C., or even a higher temperature is reached. The oil collected at 167° C. has a specific gravity of 0·863 and deviates the plane of polarized light 5·6° to the left; that collected at 160° C. presents the same properties; but that collected at 170° C. and beyond deviates the plane of polarized light 7·2° to the left.

Glacial acetic acid dissolves this oil of turpentine freely; at a temperature of about 54° C. equal parts of the acid and the oil can be perfectly mixed, but upon cooling a certain part of the acid separates.

Oil of Canadian turpentine treated with gaseous hydrochloric acid gas does not give a crystalline combination, but one is easily obtained by adding fuming nitric acid and then heating the mixture gently; the interior of the retort becomes coated with crystals having the formula $C_{10}H_{16}+HCl$.

This oil of turpentine approaches that yielded by the cones of *Pinus Pinea*, L., or by the leaves of *P. Pumilio*,* Haenke, and the greater part of the oils of turpentine of French origin, whilst oil of turpentine of American origin rotates the plane of polarized light to the right, and combines immediately with hydrochloric acid gas to form the crystallizable compound.

Canadian turpentine yields about 20 per cent. of oil when the extraction is effected by the water-bath, and 18 per cent. when extracted with water.

Alsatian oil of turpentine (*Abies pectinata*), purified after treatment with sodium, rotates the plane of polarized light 8° to the left, and boils at 163° C. After being kept two or three years in a well-closed bottle it becomes thick and dextrogyre. When saturated with hydrochloric acid gas it does not give a solid compound. This oil has the pleasant aromatic citron-like odour of the turpentine from which it is extracted. The oil extracted from the cones of the same tree is more odoriferous and rotates the plane of polarized light much more strongly (51 to the left); nevertheless no difference has been recognized in its chemical composition. Strassburg turpentine contains about 24 per cent. of oil.

Burgundy oil of turpentine rotates the plane of polarized light 8·5° to the left. It contains a small quantity of oxygenated oil, from which it can be freed by treatment with sodium. In the pure state it does not yield a crystallizable compound with gaseous hydrochloric acid.

Uses.—Turpentine oil is employed in medicine and in the veterinary art, both for internal and external administration. It has been recommended as an antidote in cases of poisoning by phosphorus, where it would act in opposition to the tendency of the phosphorus to deprive the hæmatose of the blood of oxygen. According to Köhler and Schimpff it forms under these circumstances terebintho-phosphorous acid, which is innocuous in its action and is easily eliminated by the urinary organs.

The property turpentine oil possesses of dissolving resinous substances leads to its employment in the manufacture of varnish. It readily dissolves fats, and formerly it was employed nearly exclusively in removing grease from cloth, etc. It dissolves linseed oil that has been rendered siccative by treatment with lead and manganese oxides, and the solution is used for varnishing leather and making oil-cloth. Its power of dissolving crude linseed and poppy oil leads to a considerable consumption of it by painters; it is also used in the preparation of body colours, its oxidizing action probably contributing to the quick drying of the picture. Finally, heated, it is used as a solvent of caoutchouc.

Adulterations.—Notwithstanding the comparatively low price of turpentine oil it is the subject of numerous sophistications, of which the following are the best known. It is believed, however, that an adulterated sample will not answer to the characters described in a previous paragraph.

(1) Fixed oils. These, if present, may be easily detected by placing a drop of the suspected turpentine oil on paper and heating moderately. If the sample be pure the spot disappears completely, but if it be mixed with a fixed oil a greasy stain remains. Further, oil of turpentine dissolves completely in 90° alcohol, whilst fixed oils only yield a small portion (the fat acids) to that solvent.

(2) Water. Leuchs points out that the clear appearance of essential oils is no proof of their absolute freedom from water. Small quantities of water may, however, be detected by shaking the oil with two or three volumes of petroleum, when the mixture becomes turbid owing to the separation of the water.

(3) "Swedish oil of turpentine," a name applied to a product of the distillation of wood. This adulteration is practised in Sweden, and the turpentine oil then has a disagreeable smell. Sandström has found that its presence can be clearly distinguished by pouring the oil carefully into a test tube containing commercial nitric acid, so as to float on the top of the acid. If "Swedish turpentine oil" be present it is immediately coloured brownish, even when mixed with four times its volume of pure oil. Genuine turpentine, whatever its origin, is not coloured at once, and only acquires a yellowish tint after some time. If "Swedish turpentine oil" be shaken with twice its volume of commercial nitric

* The *oil of pine leaves* is a greenish yellow liquid, with an aromatic odour recalling that of oil of lavender; it is soluble in alcohol and ether and has the composition of the oils of turpentine.

Oil of Pine branches (Oleum templinum) is the product of the distillation of the young twigs and buds of *P. Pumilio*; it is of a greenish yellow colour, and has an aromatic odour and the composition of oil of turpentine. It is prepared in Germany and is supplied especially from the Carpathian mountains.

acid, a brownish colour is quickly produced that becomes darker, and finally black in proportion as the mixture is thoroughly effected. Pure turpentine oil, treated in the same manner, is at first only coloured by the acid yellow, becoming at the end of two hours yellowish red. In this experiment the turpentine oil does not mix thoroughly with the acid, a portion, having a pale yellow colour, floating on the top. If the "Swedish turpentine oil" is not completely colourless it does not mix intimately with the acid, and the formation of a brownish black resinous layer can then be observed.

(4) "Oil of Pine" (German, *Kienöl*). To detect this sophistication Lintmans recommends to take 2 grams of the suspected oil, add to it 4 grams of ammonia, sp. gr. 0·96, filter, and treat the filtrate with a few drops of a 10 per cent. solution of potassium nitrate; then add carefully 10 drops of nitric acid, sp. gr. 1·3, so that it descends to the bottom of the aqueous layer. If "oil of pine" be present a yellow or yellowish brown colour is produced. A mixture of 1 part of "oil of pine" with 19 parts of turpentine oil gives a perceptible colour.

(*To be continued.*)

NOTE ON HYDROBROMIC ACID.*

BY EDWARD R. SQUIBB, M.D.

Among the recent additions to the materia medica hydrobromic acid seems likely to take a permanent place if some method of preparation and some standard of strength can be adopted whereby a moderate degree of precision in its use might be attained.

Various modes of preparation have supplied the market up to the present time with acid of various, and commonly unknown strengths; and generally not pure enough for medical uses. And the various arbitrary doses published with the various acids as sold seem to bear no proper relation to its strength or to its therapeutic power as compared with the bromides for which it is used as a substitute.

Hence, as might reasonably be expected, the experience and testimony, in regard to its utility, are confused and often conflicting, and this apparently without any suspicion that the confusion and failures might depend on the quality and strength of the acid used.

Physicians prescribe such articles, and pharmacists buy and dispense them, too often as if there could be but one thing supplied. For example, the physician prescribes hydrobromic acid in half drachm doses. The pharmacist goes to the manufacturer, or to the importing house, and buys it to dispense, and too often neither of them know that it may be of any strength from one to fifty per cent. And, when the percentage strength is known, few will calculate what should be the dose equivalent to the bromide for which it is to be substituted, or appropriate to the bromine effect that is desired.

It is true that the dose cannot be determined by the quantity of bromine present in the acid as compared with that present in the bromides, no more than the dose of chlorine could be determined by the quantity present in the chlorides, or of cyanogen by the quantity present in the cyanides; yet there is doubtless some relation, and this relation when studied is the best basis for the accumulation of facts and experience.

The acid is a sedative neurotic, and its principal uses as developed up to this time are as an occasional substitute or alternate for the bromides of potassium, sodium and ammonium. It is well established that the bromine is the active medicinal agent, whose influence is sought in the use of these salts. And it is also well known that the alkaline bases,—and especially potassium,—when given for a long time, are liable to enfeeble the muscular tissues; and produce other changes not desirable, through undue alkalinity of the blood and the secretions; and, through the secretions to enfeeble the digestive and assimilative processes. It is true that the proportion of cases in which such effects come into undue prominence is small, but to correct them where they do occur, and to forestall them when likely to occur, without suspending the bromine, whose continuous sedative action is often very important,—this acid now comes into use.

It is, however, certainly not well adapted to very prolonged use, for like other so-called mineral acids, it would be very liable to interfere more with the normal processes of the economy than the bromine salts with alkaline bases. Therefore, for the present at least, it must be regarded simply as an alternate for the bromides, for occasional and exceptional, rather than for general use. Such uses are, however, very important in the treatment of chronic affections of the nervous system, even when neither functional nor organic mischief is observed or apprehended, for several reasons, among which the disgust which patients often acquire for salines when long continued is not the least. In hospitals for the insane, especially in the epileptic wards, it should be very useful both in effect and in facility of administration, because it can be given in the form of lemonade, if moderate or small doses should prove effective.

It has been highly spoken of as a corrective and preventive remedy for the headache, ringing of the ears, and general cerebral distress which often follows upon the use of salts of quinia,—which should be called quinism and not cinchonism. When given with or after the salts of quinia the disagreeable head symptoms are said to be prevented. It should be remembered, however, that as a general rule some degree of this quinism is necessary to indicate the full power of quinia salts, and that irrespective of the quantity given the full influence as an antiperiodic is never assured without some degree of the head symptoms; and, that the dose required to produce the full antiperiodic effect varies very much in different individuals, and even in the same individual at different times. In those cases where small quantities of any of the salts of quinia produce head symptoms of disproportionate severity, so that the desired benefit of the antiperiodic cannot be attained because the sufficient dose cannot be borne,—this acid is said to be very useful, either given with the quinia salt, or later, when the head symptoms begin. It is also said to be useful in nervous headaches and tinnitus from other causes than the administration of quinia salts, and to be effective when given at any stage of the affection.

Other uses to which the acid has been applied with alleged advantage are not yet confirmed.

The first necessity in the application of a new remedy is to know its relations of quantity and effect upon the economy, and this starting point being generally difficult to obtain, many valuable agents are lost, while others blunder into use through confusion and difficulty, or become a prey to empiricism. Thus the beneficent effects of potassium bromide as a sedative neurotic, failed of full recognization for more than twenty years, through the inadequate quantities directed as doses by standard authorities; and it was only where the so-called toxic doses were exceeded that its utility in a large class of cases was realized.

It being now generally established that it is the bromine element which is effective in all the bromides, the base merely giving direction to the sedative action, and to the rate of elimination, the doses required for a given effect are approximately proportionate to the quantity of bromine present in the different bromides. Potassium bromide contains 67·22 per cent. of bromine; sodium bromide, 71·4 per cent.;* and ammonium bromide 81·6 per cent., and

* From the 'Transactions of the Medical Society of the State of New York, 1878.

* The sodium bromide of the United States market seems to be neither the anhydrous salt, containing 7·77 per cent. of

therefore their doses, to be equivalent in bromine, are nearly in the ratio of 9, 8, and 7½. That is, 20 grains of potassium bromide is equal to a dose of 18·8 grains of the sodium salt, or 16·5 grains of the ammonium salt, the quantity of bromine being constant in all three at about 13·44 grains. But such a quantity as 13·44 grains of uncombined bromine put into the stomach would probably be a fatal poison.

Hydrobromic acid,—which is really hydrogen bromide, or bromide of hydrogen,—is a gaseous substance containing 98·76 per cent. of bromine. But the solution of the gas in water which constitutes the liquid commonly known as hydrobromic acid, may contain the gas in any proportion, or be of any strength, and when stronger than about 40 per cent. it is corrosive and inconvenient for any ordinary uses.

The potassium salt is, of all the bromides, the most commonly used, and its doses to obtain given effects are best established. Hence if this salt be used as a standard for hydrobromic acid, as it is for other bromides, and the acid be adjusted in strength so as to bear some easily remembered relation of its bromine constituent to the potassium salt, a base or starting point would be established for its general and accurate use, whether the bromine when combined with hydrogen should prove more active than when combined with potassium or not. Then as the potassium salt contains, in round numbers, say 68 per cent. of bromine, a solution of hydrobromic acid containing also 68 per cent. of bromine would have the same bromine value, though not necessarily the same bromine effect in medicine. But an acid of this strength would be unnecessarily difficult to make and to dispense. The next most simple relation is to have an acid of half the bromine strength of the salt, or 34 per cent. Such a strength can be made, kept and dispensed without unusual difficulty, and represents the bromine of the potassium bromide in the proportion of about 2 to 1, a relation easily remembered, and convenient in use. Therefore this strength has been adopted as a proper and convenient one, and the quantity of such an acid equal to the bromine of 20 grains of potassium bromide would be 40 grains, though the equivalent dose might be smaller to produce a given effect, should bromine when combined with hydrogen prove more active than when combined with potassium.

The formula and process for making an acid of this strength are as follows :

Take of Potassium Bromide	Six parts.
Sulphuric Acid, s. g. at 15·6°C.=60°F. 1·838, at 25°C.=77°F. 1·828.	Seven parts.
Water	Nine parts.

Add to the sulphuric acid one part of the water and cool the mixture. Then dissolve the potassium bromide in six parts of the water by means of heat, supplying the loss of water by evaporation during the heating. Pour the diluted sulphuric acid slowly into the hot solution with constant stirring, and set the mixture aside for 24 hours that the sulphate of potassium may crystallize. Pour off the liquid into a retort, break up the crystalline mass, transfer it to a funnel, and having drained the crystals, drop slowly upon them two parts of the water so as to displace and wash out the acid liquid. Add the liquid thus drained off and washed out to that in the retort, and distil the whole nearly to dryness, or until nothing further distils off by moderate heating. The distillate will weigh about ten parts and should contain about 37 per cent. of hydrobromic acid. Assay this by means of normal volumetric solution of sodium, and add distilled water until it shall have the strength of 34 per cent. of hydrobromic acid. The product will weigh about eleven parts, and the loss of hydrobromic acid as calculated from the potassium bromide will be about 1·2 per cent.

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bromine, nor that with four equivalents of water containing 57·55 per cent., but a mixture of the two containing about 9 per cent. of water, and therefore containing about 71·4 per cent. of bromine as above stated.

Solution of hydrobromic acid thus prepared is a limpid, colourless, odourless liquid, having a strongly acid taste. At 15·6°C.=60°F. it has a s. g. of 1·274. At 25°C.=77°F. the s. g. is 1·257 both compared with water at 15·6°C.=60°F. It is free from sulphuric acid, or gives but an unimportant trace when tested with solution of baric chloride; and is free from sulphurous acid when tested by its action on pure zinc, yielding a gas which does not blacken paper moistened with solution of plumbic acetate. It leaves on evaporation no residue, or but an accidental trace.

It consists of about 33·4 per cent. of bromine, about 0·6 per cent. of hydrogen, and 66 per cent. of water ; or, of 34 per cent. of hydrobromic acid, HBr=81 and 66 per cent. of water. Its formula is (H=1+Br=80=) HBr=81+Aq.

In making this acid on a scale suited to the physician or pharmacist each part in the formula may be represented by 2·835 grams = 1 ounce avoirdupois, and the process answers very well upon this scale, yielding about 366 grams=12·47 ounces.

Tared beakers, a retort about double the capacity of the liquid, with a strip of wire cloth around it where the heating flame is applied, and a small Liebig's condenser, are necessary for this process, and in the distillation here, as indeed everywhere, the lamp flame should be applied to the side of the retort.

If the mixture of sulphuric acid and water be not cooled it causes spattering and loss when poured into the hot solution of the bromide. In dissolving the bromide in an equal weight of water by heating, there is loss of water by evaporation, and unless this loss be made up it will not be practicable to get a perfect solution. But an entirely perfect solution is not essential, provided the undissolved portion be in a finely divided state, for when the diluted sulphuric acid is poured slowly in with stirring any small proportion of the bromide will be dissolved by the additional amount of liquid, and by the stirring. After standing 24 hours the lower part of the vessel will be occupied by a mass of crystals of large size, easily broken up to drain and wash. The quantity of sulphuric acid taken for the process appears disproportionate, being in excess of the quantity necessary to form acid potassium sulphate ; but unless such excess be taken the salt will not crystallize out as completely, and then the distillation will be defeated when only about half finished, by bumping in the retort. Smaller proportions of acid were successively tried, and when bumping occurred the process was stopped, and the contents of the retort were turned out, cooled and the crystals separated, drained and washed, but this is troublesome and entirely unnecessary if the larger proportion of acid be used, for then almost the whole of the salt crystallizes out, rendering the process easy when it would be otherwise either troublesome or entirely impracticable. Near the close of the distillation the heat must be kept moderate, because if increased much, sulphuric and sulphurous acids are liable to be distilled over in considerable quantities. The minute quantities of both which do go over, even in a well managed distillation, are probably thrown over mechanically by the bursting of bubbles on the surface of the boiling liquid. The quantity of either in the distillate of a well managed distillation is but a trace, and so small as to be unimportant. But should it be desired to have the distillate entirely free from these acids, a very small quantity of barium hydrate must be added and the whole be re-distilled. In the distillation the hydrobromic acid comes over comparatively weak at first, the strength gradually increasing to about 47 per cent., hence the distillate should be well stirred before being tested or assayed.

In testing for sulphurous acid it is only necessary to put a small piece of pure zinc into a test tube, pour upon it a few drops of the acid, push into the upper part a loose wad of cotton wool, and lay the paper moistened with solution of plumbic acetate on to the cotton wool.

The assays and adjustment of strength are conveniently and easily made as follows: The atomic weight of HBr being 81, a half of the tenth part of this number, namely 4·05 grams, is weighed off, and normal sodium solution is dropped into it from a burette to the point of saturation, as ascertained by means of a small piece of litmus paper kept floating in the acid as it is stirred during the dropping in of the volumetric sodium solution. Usually 18 to 19 c.c. of the volumetric solution is required for saturation.

Then, as only half of 8·1 grams was taken for the assay, this reading from the burette must be doubled, and therefore indicates 36 to 38 per cent. as the strength. Then weigh the distillate again, and add to it 5 per cent. of its weight of distilled water and again assay it as before. By calculation from the quantity of water used to reduce it to this new strength, the additional quantity of water necessary to reduce it to the 34 per cent. required is easily found. When this shall have been added, and the whole well stirred, a final assay should be made to verify the result.

This acid, in common with all the others, should be dispensed by weight. A troy ounce of it contains almost exactly 400 minims (401·48 +) and the fluidounce, of 480 minims, weighs almost exactly 574 grains (573·86 +). A drachm of it, therefore, would contain 50 minims, and would be the bromine equivalent of 30 grains of potassium bromide. A gram of the acid is equal to 12·86 minims, and therefore 4 grams would be 51·44 minims, equal to 30·86 grains of the potassium bromide, a very large sedative dose.

The acid is not very easily administered in full doses in consequence of the large dilution necessary, and the disagreeable effect of "setting the teeth on edge." A dose of 50 grains, equal to 41·66 minims, and to 25 grains of potassium bromide, requires not less than 8 fluidounces of dilution. And the dilution must contain not less than an ounce of sugar or two ounces of syrup to make it easily drinkable. This will be found to be the principal drawback to the use of the acid unless it shall be proved to be effective in smaller quantities than its equivalence to the bromides indicates. And this effectiveness in much smaller doses is not only probable, but almost certain if the experience of Fothergill and others may be trusted, since they give it in doses of one-eighth to one-fourth of those here indicated as being the bromine equivalent of potassium bromide. That is to say, the doses advised by those who appear to have used it with the best effects are equivalent to about 6 to 8 grains of potassium bromide.

This published experience would make the average dose of the acid here described, say about 12 to 16 grains, or the bromine equivalent of only 6 to 8 grains of potassium bromide. In the very limited experience of physicians around the writer these doses are too small, and 20 to 30 grains, equal to 10 to 15 grains of potassium bromide are needed for a prompt sedative effect, while 40 to 50 grain doses are not uncommon. And such doses have to be repeated at times in controlling the headache, etc., of quinism. Even such doses require a dilution of two to four fluidounces of water for easy administration.

If 60 grains=50 minims of the acid here described be added to 1140 grains of syrup, the mixture will measure two fluidounces and weigh (60+1140=) 1200 grains. Each 75 grains of this, 1 fluidrachm, will contain 4 grains nearly, or a little more than 3 minins of the acid. And 4 fluidrachms of this, equal to 15 grains of the acid when diluted with ice water to 2 to 4 fluidounces makes a dose which is easily administered and probably effective. Such a dose is equal to 12·5 grains of potassium bromide.

Beside the administration of single doses for temporary sedative effect, it will, however, doubtless come into occasional use for a more prolonged and permanent effect, as a partial substitute or alternate for the bromides, to correct or prevent alkaline saturation. The doses for such continuous uses do not seem to have been ascertained, for no instance of bromism from its use has been published so far as this writer has seen. Therefore as bromism must be the test of effective quantity, the doses must be considered as unsettled. If the bromine as present in this acid should prove capable of producing bromism in much smaller quantity than that present in the bromides, as seems to be foreshadowed in its use up to this time, then an important advantage will have been gained, and the doses of the acid will be correspondingly smaller.

At present it appears that for continuous use as a substitute for the bromides, to be continued through several weeks, or until the bromides can be resumed doses of 20 to 30 grains might be sufficient. It may also be found that by adding smaller quantities of the acid to reduced doses of the bromides the alkaline saturation might be postponed or avoided. For example, where an epileptic may be taking 25 grains of potassium bromide three or four times a day, it may, and probably will be found that the dose of bromide can be reduced to 20 grains or less by adding one, two or three grains of this acid to the smaller dose. Such uses as this for the acid are well worth careful trial, and in such quantities it can be easily administered.

The acid will also undoubtedly prove very useful for making solutions of various bromides extemporaneously. For example, lithium bromide should by its composition be very useful in medicine, as the salt contains nearly 90 per cent. of bromine,—or more bromine and less base than any other neutral salt possible. This is easily made, simply by saturating the acid with lithium carbonate, and adjusting the volume of the solution to the dose required.

Many formulas have been published for making this acid for medicinal uses, but all so faulty and inaccurate, or so difficult as to be impracticable for ordinary use where any moderate degree of precision in medication is required.

That of Fothergill was among the earliest, and has been by far the most used. It is given in his 'Handbook of Treatment,' American edition of 1877, p. 569. The formula is loose and inaccurate, containing a considerable excess (161 grains) of potassium bromide. Its quantitative defects are easily remedied, but it yields a complex solution containing much tartaric acid and potassium, and is otherwise objectionable, having all the faults of the process upon which it is modelled, namely, the process for hydriodic acid by Buchanan, of Glasgow. Made by Fothergill's formula it will commonly contain between 8 and 9 per cent. of the hydrobromic acid, and as the dose is stated at "ʒss. to ʒi," if this be by weight as it is written, it will be equivalent to 4 to 8 grains of potassium bromide only.

Fothergill's process was very much improved by Mr. Charles Rice; see *New Remedies* for April 16, 1877, p. 107. But this preparation, though much more definite, is still liable to the objection of containing much tartaric acid and potassium, and therefore of being difficult to identify or verify, or to discriminate by tests or by assay.

Much better results are obtained by the original process of Balard, particularly as modified by Professor J. M. Maisch. See 'Proceedings of The American Pharmaceutical Association for 1860,' p. 220, or as still farther modified by Professor G. F. H. Markoe, see 'Proceedings of The American Pharmaceutical Association for 1875,' p. 686. But these and many other published processes are less simple and easy than that here proposed.

That here given is not original with the writer, but is alluded to in all standard works on chemistry: but, without the variation in quantity of sulphuric acid used, and without crystallizing out the potassium sulphate before the distillation, the process is impracticable,—or at least has always proved to be so in the writer's hands, and in the hands of all whom he has known to have tried it.

Brooklyn.

THE UNIVERSAL INTERNATIONAL EXPOSITION OF 1878.

Mr. Editor,—Having recently returned from a visit to Paris on business connected with pharmacy, it has occurred to me that some of your readers might be desirous of knowing what progress has been made with the International Exhibition there. Although there is now little to report of pharmaceutical interest, yet there promises to be a very great deal to see in two or three months' time.

The exhibition proper occupies the whole of the Champ de Mars from the Seine to the Military School, and is in the form of an immense parallelogram about half a mile long and nearly a quarter of a mile broad. On the opposite side of the Seine and crowning the hill of the Trocadero stands the large Concert Hall, extending in the form of a crescent the whole width of the Champ de Mars, while in front of it and covering the slope of the hill down to the river are ornamental grounds, which are connected with those of the Exhibition proper by a newly erected bridge. The Exhibition itself is not a very conspicuous object until seen from the hill opposite, and then it is too large to be seen at a glance, but the appearance of the Concert Hall is commanding in the extreme. Although little more than the outside of this handsome building was completed at the time of my visit, yet, it was evident that when the ornamental grounds with the cascades in the centre and the flower beds and fresh water aquarium are finished, together with the picturesque buildings representing Japanese, Chinese, Persian, Algerian, Swiss, and Norwegian dwellings, it will form an exceedingly attractive picture, and the best view of the Exhibition will undoubtedly be obtainable from the gallery which runs along the whole length of its frontage.

The Exhibition proper is progressing much more rapidly in some parts than in others. As might be expected, the French departments were most advanced, whilst the Canadian and English showed signs of rapid development. The English department occupies a considerable space on the right of the main entrance, and the spaces for exhibition were allotted, numbered and named, and the tramway for facilitating the movement of heavy packages was already at work.

In the United States' department, which occupies the next position on the right, scarcely anything had been done.

In the French departments the progress made was very unequal: in a few places some cases and fittings were already in position, as in the colonial portion, and in the part where leathern articles and jewellery, travelling accompaniments, etc., are to be exhibited; while elsewhere nothing but bare wooden partitions were to be seen. This unfortunately was the case with the portion devoted to chemical and pharmaceutical products. In the Chinese department some natives of that country were leisurely unpacking the fittings preparatory to putting them together. Although the French do not cease working on Sundays, there is evidently an immense deal to be done in the fifty days that still remain for the purpose. The railway is being brought close to the entrance, and a station is being erected near the right hand corner of the front of the Exhibition, while tramways are being laid down from all parts of the city. The latter terminate on the opposite side of the Seine, just where it is crossed by the new bridge before mentioned.

As might be expected some of the best restaurants will be represented, and, with the usual taste displayed by the Parisians, they will either occupy spots affording excellent opportunities for seeing all that is passing along the Seine, etc., or will be perched where the prettiest views in the ornamental grounds may be obtained.

But although there was little to see in the International Exhibition, the Palais d'Industrie, where an Agricultural Exhibition was being held, was well worth visiting. Around the building were all kinds of novelties in agricultural implements, one of which particularly attracted my notice for its simplicity and ingenuity; it was the application of the principle of the "fox and geese" game to gates, so that by simply pushing the gate it closed up, and occupied barely a quarter of the space it filled when at rest.

The beautifully neat stalls for the animals, and the exceeding cleanliness of the animals themselves were remarkable, while the arrangements for the locomotion of visitors left nothing to desire. In one corner, however, might be seen the disgusting operation of feeding fowls by machinery, each dose of food being forced down their throats, and its quantity regulated and pointed out on a dial. But it was not this portion which presented anything of interest to the pharmacist. In the upper storey of the building, in the rooms where the vegetables were being exhibited, many curious fruits were to be seen.

Specimens from Algeria included the curious form of citron, known in China as Buddha's claw, in which some of the carpels become almost distinct, so as to give the appearance of a hand compressed laterally, or of the claw of an animal. Other objects of interest were the café nègre, consisting of the small seeds of *Cassia occidentalis*, used in various parts of Africa as a substitute for coffee; Gobbo, the sliced unripe fruits of *Hibiscus esculentus*, used for thickening soups, and ambrette or musk seed from *Hibiscus abelmoschus*. Another curious object noticeable here consisted of some rolls of yellowish looking bread made from large gourds, beside which they were placed. The delicate perfume of the vanilla from the Isles of Bourbon, Martinique, and Gaudeloupe attracted many customers on the last day of the show. The cherrymoyers, a most luscious fruit, although furnished with a rough looking exterior, were also shown.

From Martinique several edible roots were exhibited, among which were noticed those of *Colocasia esculenta*, one of the roots which are cultivated also in the Sandwich Islands under the name of Taro; the leaves also are used as a vegetable. The curious fruit of *Sechium edule*, about the size of a large quince and covered with small prickles like the prickly pear, which is used in slices for salad, being first washed in salt water, was likewise represented. This is the chocho of the West Indies, but the fruits were labelled chayotes, a name under which they sometimes appear in Covent Garden market. The large fleshy root of the same plant, which is cooked like a yam, was also to be seen.

Other singular objects, but exhibited merely as curiosities, were the long pods of the poincillade royale (*Poinciana regia?*), and some smaller ones from one of the copal trees (*Hymenæa Courbaril*).

Some excellent specimens of honey and beeswax were also exhibited in this department. The specimens of beeswax of Mons. J. Lediard, which won the first prize, were remarkably fine, and in point of colour, odour, and consistency left nothing to be desired.—"EXPOSITION."

The Pharmaceutical Journal.

SATURDAY, MARCH 16, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

EFFLUVIUM NUISANCES.

ABOUT three years since, at the suggestion of Mr. SIMON, the President of the Local Government Board charged Dr. BALLARD with a general inquiry into the "effluvium nuisances" which arise in connection with various manufacturing and other branches of industry, especially with regard to the effect of each nuisance upon the public health and the degree to which it might be preventible. The first report of Dr. BALLARD upon the work accomplished by him in this direction has just appeared in the form of an Appendix to the Annual Report of the Medical Officer to the Board, and it gives every indication that this important investigation will be carried out in a most thorough and impartial manner. The Report contains a vast amount of information concerning the manner in which some of the industries that are the subject of the inquiry are carried on, so that it would be impossible here to enter into the details; but a brief space may be profitably devoted to recapitulating the principal results and inferences which Dr. BALLARD has drawn from his experience so far as it has gone, not only because the question is one of primary importance to the public health, but because many of the problems that it presents will probably have to be solved by the chemist.

While inquiring into the extent and degree of the inconvenience to the community occasioned by industrial nuisances Dr. BALLARD found that the frequency of complaints is not a trustworthy criterion of the extent or intensity of a nuisance. This is due to various causes, such as the desire not to be thought unneighbourly, the fear of displeasing an influential offender, the greater or less dependence of those most inconvenienced upon the industry as a means of sustenance, the difficulty where several establishments stand close together of distinguishing from which the nuisance proceeds, and especially the fact that habitual exposure to trade effluvia tends to render people less sensitive to their influence, so that sometimes a nuisance is less complained of in the immediate neighbourhood of a manufactory than at a distance where the effluvia is only occasionally wafted by the wind. It is evident, however, that the immunity of the immediate neighbourhood may sometimes be more real than would appear at first sight, and the distance at which the nuisance becomes most manifest may be dependent upon the height of the chimney from which the effluvia are discharged, the density of the vapours, and other conditions.

The classification of the businesses which give off effluvia creating nuisance is very difficult, and that adopted in the report is rather arbitrary than scientific. But Dr. BALLARD has no difficulty in awarding the palm for pre-eminence in giving off offensive effluvia to the trade processes in which the materials used consist mainly of animal matters, the most disgusting of all being gut scraping and the preparation of sausage skins and catgut, the preparation of artificial manures from "scutch" (or refuse from the glue manufacture), and the melting of some kinds of fat. Manufactures dealing with vegetable materials are often very offensive, but rarely give rise to disgusting effluvia; among the most offensive being the effluvia given off during the heating of vegetable oils, as during the boiling of linseed oil and the manufacture of palmitic acid from cotton oil or palm oil, and the manipulation of some varnishes. Of industries dealing with inorganic materials, those yielding the most offensive effluvia are the manufacture of ammonium sulphide and chloride, and some other processes in which there is a copious evolution of sulphuretted hydrogen, gas making, and the distilling of tar. The principal complaints in reference to the acid and irritating fumes given off in the alkali and bleaching-powder manufacture appear to have relation rather to the injury they cause to vegetation than to their effect upon the public health.

As to what extent trade effluvia are to be considered injurious to the public the determination is still more difficult, so much depending upon the definition of "injurious." It may be held to mean a temporary discomfort or other functional disturbance occurring as a result upon exposure to a certain effluvium, but tending by repetition, if not to a clearly defined form of disease, to an appreciable impairment of health and strength. On the other hand, it may be limited to the cases where persons exposed are definitely injured in health and have their lives shortened, or are rendered more susceptible to attacks from, and less able to cope with, various forms of disease. Again, cases occur where individuals, either through idiosyncrasy or an already impaired state of health, suffer severely from exposure to an effluvium that is at the most disagreeable to others. This part of the subject is so complicated, and the dearth of data that would assist in forming a judgment is at present so great, that the reporter is able only to touch the fringe of it.

In dealing, however, with the argument so frequently put forward by persons interested in this class of manufactures, as to the innocuousness of offensive effluvia, based upon the health of the workmen engaged in the works and continually exposed to them, Dr. BALLARD points out that this is probably due to a great extent to a kind of selection and survival of the fittest. Moreover, there appears to be no doubt that in well managed and ventilated works, men employed within the building may be less exposed to noxious gases evolved during the operation than people outside. It has also been urged that some of the effluvia escaping from chemical works, such as chlorine, sulphurous acid, or tar vapour, are actually beneficial by virtue of their known disinfecting properties; but as Dr. BALLARD points out, such disinfecting agents to be effectually operative against any contagion need to be applied to it in a state of concentration far greater than that of the diluted effluvia met with outside chemical works.

There are four conclusions to which Dr. BALLARD has come in respect to the influence effluvium nuisances may have upon the public health. First, that trade effluvia decidedly contributes towards the atmospheric impurity, to which the comparative insalubrity of towns is due. Secondly, that in distinguishing between different kinds of effluvia, those which have their origin in the decomposition of organic matter, and especially animal matter, under the influence of a septic ferment, stand out as unquestionably dangerous and the source of much fatal disease. Thirdly, that there are some businesses in which the refuse matters dealt with are liable to be infected with the specific contagia of infectious diseases, and that when the effluvium produced is consequently charged with infectious matter it cannot fail to be dangerous to persons exposed to its influence. Fourthly, that in some cases the effluvia consists of definite chemical compounds which are poisonous or irritant in a concentrated form, and that even when diluted with atmospheric air they are more or less injurious.

LATAKIA TOBACCO.

THE statement made in our editorial columns last week that the error as to *Nicotiana rustica* being the botanical source of various kinds of tobacco having been copied into 'Medicinal Plants,' is incorrect as regards Latakia tobacco, as may be seen from the following extract from Part 8 of that work:—"Professor THISELTON DYER has just proved that Latakia Tobacco, which has hitherto been always supposed to be derived from *N. rustica*, L., is prepared from the flowering panicles and even the capsules of *N. tabacum*." This Part was published on 1st May, 1876, and the above was the first printed notice of Mr. DYER's observations which were only communicated to the Linnean Society at their meeting ten days before (on April 20th), and were not published in the Journal of the Society till the July following.

ARTIFICIAL GEMS.

NOW-A-DAYS the "philosophical stone," contact with which would convert the baser metals into gold, is looked upon as a chimera, although it is admitted that the search for it had a very beneficial influence upon the development of chemistry. But the attempts of chemists to produce other precious stones promises to be more successful, and not only to advance the interests of science, but also to become an indirect source of the noble metal to the workers. Following in the footsteps of Sainte-Claire Deville and others, MM. E. Frémy and Feil have obtained some very interesting results in attempting to produce the corundum, ruby, and topaz artificially. The method found to give the best results is to maintain a fusible aluminate, such as aluminate of lead, for a considerable time at a red heat in the presence of a silicious substance. The silica gradually displaces the alumina in a condition favourable to its crystallization. Thus, upon heating equal weights of alumina and minium in a crucible made of a refractory silicious material, the oxide of lead attacks the silica of the crucible to an extent sufficient to produce the conditions just described, and when these have been kept up long enough, upon cooling, two layers are formed, one consisting of silicate of lead, the other frequently full of fine crystals of alumina or corundum. To produce the ruby colour it is only necessary to add 2 or 3 per cent. of bichromate of potash to the mixture, whilst the sapphire blue is produced by a small quantity of oxide of cobalt and a trace of bichromate of potash. The ruby crystals are usually covered with a film of lead silicate that has to be removed; but sometimes crystals are nearly pure, and possess the composition, lustre, hardness, and crystalline form of the natural stones. Like the natural ruby, the artificial one loses its rose colour upon being heated, and recovers it upon cooling. As a rule, however, the artificial crystals yet obtained do not possess the lustre required by the jeweller, or present to the lapidary conditions favourable for cleavage or cutting, though quite fitted for horological purposes. The fusing operations were carried out in the furnace of a glass-works.

THE LIVERPOOL CHEMISTS' PRICE LIST.

UNDER this title the Liverpool Registered Chemists' Association, some time since, issued a price list for the use of the Chemists and Druggists of the Liverpool district. So well has this little work been appreciated that a second edition has become necessary, in which the improvement has been introduced of arranging all the articles in alphabetical order. Further particulars will be found in the advertising sheet of the present number.

PROSECUTION UNDER THE PHARMACY ACT.

ON another page will be found a report of the proceedings before a magistrate in a prosecution initiated by the Pharmaceutical Society, under the 17th section of the Pharmacy Act, 1868. The case promises to be a very important one, but as it is at present undecided we refrain from comment, further than to express the hope that a case may be granted in order that the points in dispute may be decided in a superior court.

Transactions of the Pharmaceutical Society.

NORTH BRITISH BRANCH.

Thoughts on Botany*—*continued.*

BY H. B. BAILDON, B.A. CANTAB.

Mr. President and Gentlemen,—When I had last the honour of addressing you, I submitted to you some reflections which had occurred to me when contemplating those facts which the science of botany makes known to us. The reflections I had made and the arguments deduced from them tended to combat and refute the views of certain eminent scientific men, whose philosophy may best be denominated automatism. Broadly stated the thesis of this school is that the universe, especially the physical universe, is self-acting, self-evolving; that no external control, no guiding intelligence, no creative energy beyond the necessary and inherent properties of matter are required or have been engaged in producing the present state of things. That this automatism is characteristic of their whole scheme is shown by the facts that they push it forward even into the very highest ranks of being, and invite their followers to consider not only plants and animals, but man himself as automatic. To the uninitiated common sense of mankind this seems arrant folly, yet to those who would be our teachers it appears to be the supreme wisdom. The error, as I deem it, into which these philosophers have fallen has arisen in a manner sufficiently simple for a youth, if not a child, to understand. The proposition that man is an automaton is precisely as true and yet as incomplete, as a description of man, as a hundred other assertions that could be made. Man is a heavy body, man is a locomotive being, man is a biped, man is a mammal, etc., etc. Each of these propositions embodies a truth, but not the whole truth; and it is the same with regard to the statement that man is an automaton. Man regarded as a mechanism is an automaton, the most wonderful ever yet produced; he *goes by himself* more completely than any other machine can be said to do, is more thoroughly automatic than any other automaton. But regarded from other points of view, the term automaton ceases to be applicable. Thus to say that a man thinks or loves automatically is either a contradiction in terms, or is merely equivalent to saying he thinks or loves. For an automaton is, by our very notion of the thing, a machine capable of accomplishing through some physical impetus an action or movement which in the first instance it required conscious intelligence to perform. That instrument is not automatic which is, like a spade or hammer, directed immediately by intelligence; but that which, like a reaping machine, dispenses with this intelligent direction in part, is, so far, automatic. Thus by its very notion and nature an automaton opposes itself in meaning to any conscious being; if conscious, it is not automatic, if automatic not conscious; and yet we are presented with the phrase *conscious automata*, which are phenomena just as likely to exist as solid liquids or hot ices. So the theorem which those of this school are committed to maintain is that animals, *i.e.*, conscious beings, are also automata, *i.e.*, unconscious machines, for other meaning than this for automata the usage of the language disallows.

This, so far, is by the way and introductory, intended to elucidate my own position by means of defining that to which it confronts. For the difference between our views is exactly analogous to the difference between an automaton and a living being. Nature from their point of view is a huge automaton, started somehow at some time, and threatening eventually to run down and stop, hanging thereafter through eternity, idle and impotent as a rusted and disused water-wheel over a channel deserted of its once forceful waters. To me nature seems vital throughout, instinct to the minutest particle with immortal energies, not in the same sense and degree vital in all parts, any more than the human frame is equally vital in its parts, yet nevertheless a living whole, not devoted to dissolution, but destined to eternal existence and everlasting growth. In thus regarding nature, it is hardly necessary to say I do not confine my regard to nature in its narrower sense. The nature I refer to includes man in all his faculties, and will include higher beings that may succeed us, or which may already exist; and this, I do not hesitate to assert, is the truly philosophical notion of nature, that which by virtue of its very breadth escapes the errors into which less extended conceptions of nature are constantly leading men. Nature in this sense is identical with fact, reality, whereas in its narrower senses it corresponds only to certain classes or groups of facts, or to facts viewed in some special relation. As for example *natural* philosophy is a purely physical science, and natural history a zoologic one; with one poet nature means external non-human nature, with another the original forces, impulses and desires seated in man. These and many other uses of the word are legitimate and even necessary, but we must be careful to mark in which sense we are using it. For now we are about to continue an appeal to nature, and, directly, only to a certain class of natural facts; but we intend to bear in mind that the nature to which our appeal is embraces many departments of which that to which our attention is directed is but one. Thus will we guard against becoming materialists, because we happen to be considering a physical subject, as in the converse case we would fortify ourselves against falling into mysticism or spiritualism, because the subject under our notice chanced to be of a metaphysical character. And this warning which we take to ourselves suggests or perhaps is suggested by the indictment, to which it seems certain high scientific authorities lay themselves open, viz., that they allow the results of their special studies too largely to dominate, too completely to determine, their conceptions of the universe at large, which universe is too mysterious and complex to render trustworthy answers to those who interrogate it in only one manner.

In my previous paper on this subject, I had commenced to trace, in a summary manner no doubt, some of the progressive stages in the history of vegetable life, to mark certain epochs in the creative epic. We had begun to consider what we called the second stage which embraced the *Musci*, *Filices*, *Lycopodia* and *Equisetaceæ*, but had only reached the first of these orders, so that it is now the *Filices* or Fern-family to which we naturally direct our attention.

The fern may be regarded as the heir or successor to the moss, seeing that in the history of soil formation, it appears requisite that the one be preceded and prepared for by the other. The one, like a prudent sire, has accumulated the capital upon which the other may subsist. The fern, though requiring as a rule but a slender portion of soil and evidently nourishing itself mainly by means of the moisture that reaches it, still does require the said capital with which to start. It demands, it implies a predecessor.

Had nature been the blind, mechanical, mindless, soulless automaton which some seem to regard her as, it must be thought highly creditable to such a mechanism, a matter remarkable in such a cosmic musical-box, that it should have produced in the humble orders already present on the earth, forms so exquisite and variety so exhaustless, but now, when it would have seemed quite sufficient that the soil should be covered with giant mosses or lichens of monster growth, this versatile machine plays, as it were, a fresh melody, a harmony of larger compass, a movement of grander volume and more stately progress. From the lowly film-fern, content to consort with the mosses of the ground, to the graceful fern-tree surmounting its slow-built stem with crowning lace-like fount of leafage fairer, if less proud, than any palm's, the fern-

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, Feb. 22, 1878.

world is the home of ever fresh and finished beauty of form, of ever-assiduous originality and delicacy of design. Not, be it at once admitted, that all forms are of equal beauty, or that some are not by comparison even homely, but that, contemplating the order as a whole, it is characterized by a clearness and cleanliness of surface and of shaping, a mastery, simplicity and subtility of curvage, a thorough and elaborate symmetry, which seem to represent nature's final self-defying effort in the direction of leaf-beauty, where that beauty is to depend mainly upon form. For nature, like a wise human artist, in the midst of her boundless resources appoints herself laws and limits. Thus colour in the fern would seem to be held subordinate to form and used rather to define and illustrate form than put itself forward as a distinct beauty. Yet a worthy and helpful servitor it proves itself, throwing as it were into relief the grace and perfection of nature's draughtmanship. This is well seen in the brownness of the wire-drawn frond stems characteristic of the adiantum. Thus coloured, the stem gives to the light pinnæ an unobtrusive and almost invisible support and attachment, thus greatly enhancing the aerial, weightless elegance of the plant. To this the maiden-hair owes much of its matchless grace. Matchless, I say advisedly, for this fern appears to me a very miracle of ethereal elegance, the very embodiment, as it were, of a sensitive maiden soul, tremblingly alive to the lightest influence, and yet strong and safe in its very delicacy and refinement. To me this seems one of those creations that touches the zenith of its possible excellence and defies the energy that produced it to produce its peer again. No doubt it may be argued that the lightness and strength displayed by this plant may be the very cause of its survival. But, apart from the fact that this is a mode of argument which can obviously be adopted in any case wherever anything appears well adapted to its environment, and which is merely equivalent to saying that a thing exists because it is adapted to exist—we need not stint our wonder and admiration that utility and beauty should thus blend in one perfection, nor need we abate our incredulity that a blind, aimless, unconscious automaton should exhibit at once adaptation so perfect, and design so delightful.

As you will have already perceived, the main argument upon which I am depending, both in this paper and in those that preceded it, is what may be called the argument from beauty. It contains a challenge flung to the Darwinist to account, on his hypothesis, for the existence of so much that charms the senses of man, to explain away, if may be, the apparent control which a subtle and exquisite sense of beauty seems to exercise over natural objects. It may be described as a flank attack on the utilitarian, automatic and atheistic position, from the æsthetic or artistic stand-point. We shall first require to establish, and this in reference to the vegetable kingdom we shall be abundantly able to do, that at least beauty of some kind is arrived at as a rule by the plant, and that, great as may be the disparity in grace and charm between different individuals, still in the existence of each there is observable an effort usually, if not always, successful to contribute to the earth's adornment and the delectation of man. If this be true, the burden of explanation, a burden, so far as my reading has gone, never yet undertaken, still less removed, lies upon those of the automatist school. A single analogy may render the position more clear. If I were to find a piece of paper upon which were a series of ink-marks, I might go through the following stages of inquiry and deduction as to the origin or originator of these markings. If I could find in them no method or law, I might say they were produced accidentally or mechanically. But supposing I at length concluded they were not mere marks but written characters, I should infer the author of them to be at the least a child of sufficient age and intelligence to form letters. If then, further, these characters were found to form words, and these words to form a rational sentence, one would, naturally, attribute their production to some person at least capable of understanding language, and of thinking. But, finally, if the communication were wise, or learned, or beautiful, or elevating, it would be only logical to ascribe the qualities wisdom, erudition, poetry or nobility to the author (it being of course assumed for the sake of simplicity that *one* person is the author both of the actual writing, and the idea expressed). From which illustration we are, I think, entitled to infer, that as it would have been foolish to suppose that the wisdom, beauty, etc., of the communication was the result of a hap-hazard arrangement of letters, so it will be irrational to conclude that the wisdom and beauty nature exhibits are accidental, automatic, and authorless. And as it would appear not only irrelevant but irrational to put forward the physical properties of pen, ink, and paper as affording the efficient causes of the writing, so is it equally irrational, as well as irrelevant, to attribute to causes purely mechanical and chemical the phenomena of life, sensitivity and consciousness.

We may here, however, frankly admit, that while we have never yet been able to discover *matter* in a condition in which it is free from the impress of mind, so likewise, so far as our present experience goes, mind has never yet been found capable of existing, disassociated from matter. Hence the obvious, it would seem, impossibility of settling the dispute as to priority of existence on anything like scientific grounds. For although, doubtless, mind, as existing in the finite beings, man and other animals, is a phenomenon which is, in the history of the physical universe, subsequent to the phenomenon of unconscious matter, nevertheless the most primitive conceivable form of matter seems to involve a pre-existent idea or scheme. Thus, if matter can in any sense be said to afford the promise and the potency of all terrestrial existence, it is only as thus endowed initially by a pre-existent intelligence.

But now let us recur, before passing onward to other instances, to our contemplation of the Fern genus. Ferns appear to me to stand in the same relation to other orders of plants as the ancient Greeks do towards the various races of men. They are the classics of nature, owing their charm to symmetry, balance, refinement, restraint. As the Greek statue or poem seems to be conceived and executed with such an exact prudence, such an accurate estimate of the limits and possibilities of art, so seems the fern, as though instinct with a power of exquisitely true precalculation, as though aware with precision of its own resources and capacity, to succeed in realizing its own dream of perfection. Its aim is rather to be, than to produce. Neither fruit nor flower, in the ordinary sense, is for it, content as it is to be beautiful and no more. And in compensation for this restraint, in reward for this—in its place—beautiful self-sufficiency, there is for it no blight and withering of flower-bell, no fall and decay of fruit. Even the very fronds refuse to fall away, but dwindle with a gradual decline and, restoring their elements to the spot whence they sprung, bequeath their bodies as true patriots to the soil of their nativity. Nor in its historic function is the fern tribe dissimilar to the Hellenic race, for as the latter has accumulated and bequeathed the fundus that underlies and renders possible all modern culture, so the former, through slow conquest and gradual accretion, has collected and compiled the rich soil, the fertile compost in which plants of greater growth and higher aspiration may dwell and flourish. And it is this function which assures us of the fact that, broadly speaking, the fern must have been the immediate successor to the moss, although there is no necessity to rely exclusively on such an argument, seeing that the main facts of palæontology tend strongly to support this conclusion. It is also instructive to note in this reference that ferns are but little adapted to contribute to the necessities of man or even of animal life as at present existing, the inference being that they belong originally to a natural economy in which such animals had no place.

Before finally parting from this portion of our subject, I should like to draw your attention to what may be termed aspiration and ingenuity in nature. As originally organized and constructed the fern is adapted for covering and adorning the surface of the ground to a height limited to that of the individual frond. But, uncontented with that, the ardour of the race, as we may call it, carried it on to an attempt to exalt itself further above the earth's surface, to form for its frondage a pedestal or column whereon it might be born aloft in honour and beauty. Having no power of producing in this instance a true stem, it would puzzle human ingenuity to predict how nature would surmount the difficulty. The expedient used is one which at once by its felicity, simplicity, and success cannot but compel our admiration. The strong leaf bases of the old fronds are, so to speak, economized as a platform within and upon which the succeeding generation of fronds is reared, to leave in their turn a higher platform for its heirs. And thus, with the infinite patience characteristic of natural processes, the column is slowly raised, season after season and tier on tier, till the feathery frondage uncurls on high from the summit of a taper shaft.

At the risk of appearing to press the analogy too persistently, I would remark that, as Greek sculpture remains unrivalled in point of pure grace, so the leafage or frondage of ferns remains peerless in nature in respect of gracefulness, variety, and refinement of form. Nature, it would seem, being for this genus shut out from the possibility of those effects that may be produced by a combination of leaves with twigs, branches, and stem, and also for the embellishment of blossom or flower, has thrown all her fictive genius into the designing of the leaf pattern and the contrivance of charmful modes of frond arrangement and curvage. By how exquisite an adjustment of relative strength and weight, for instance, must the parabolic curves of some fronds be attained: some having the aerial spring of a rocket as it rises and spreads towards the zenith of its flight; others the energetic shoot of a stream over rocks; one the idle curl of an ostrich plume; another the strong poise of a gull's wings stretched over sea. Not, with however wild a grace she may carry it off, does nature disregard method in the order and manner in which the fronds are given off from the root. There are some collected in a nest or crown, some flinging themselves up, as if on tiptoe, each higher than the last, and yet others waywardly following each other through the woodland, as though they played at some fairy follow-me-leader.

This is not mere sentiment, sentiment at least that may be used as a reproach. It is statement of facts, facts of human experience. For the proposition that these ferns are delight giving and beautiful depends for its validity on experience, just as directly and purely on experience as the most commonplace and universally accepted proposition, such as that honey is sweet. The appeal lies, as in all scientific matters, to the tribunal or test of human perception, and that appeal is for us the ultimate one; and the process of establishing the one proposition would be closely analogous, if not identical, with that which must be employed in the establishment of the other. Honey has been put to the test of taste by innumerable human beings, and has by an overwhelming majority been pronounced sweet. Certain other things, such as pearls and diamonds, have been pronounced beautiful. The one verdict is no more open to be stigmatized as mere sentiment than the other. Still, let us at once admit that there is a difference. It is quite conceivable and highly probable that if they could communicate their opinion many animals besides men would vote with the majority in the matter of honey; but it is difficult to perceive and highly improbable that any animal except man has the faculty of discerning between what is beautiful and what is the reverse.* It is even extremely likely, if it has not been already proved, that this faculty exists to a very slight extent in the lower races of mankind, and there can be no doubt of its having developed along with the progress of the race. Still it is remarkable that one of the earliest instincts of the savage and the child is towards the acquiring of objects of bright and, even to our taste, pleasing colours. This faculty, then, appears to be distinctively human and to be dependent on a higher cerebral development than any infrahuman; from which conclusion we may draw two inferences, first, that the faculty itself may safely be classed as a higher and more intellectual one than that which discriminates between what is sweet to the palate and what is not so; secondly, we may with equal safety conclude that it will improve and develop with the progress of the race and become more refined and subtle in its discernment. It may be as well to remark in passing that this development could not go on had the world been filled with objects of equal beauty or even of objects all beautiful. We are now in a position to discern more clearly what the difference is which was acknowledged to exist between the two cases which were instanced as analogous. In the first place, it is, I think, clear that the special faculty to which appeal is made on the matter of beauty is higher, more intellectual and truly human than that of mere taste, and secondly, we may conclude that the testimony of the more highly developed races and of the most cultured individuals in those races will be entitled to greater weight than that of inferior races and less cultured individuals. If, then, it should be for a moment disputed that such beauties and charms as I have claimed for the fern tribe do really pertain to them, decision would not be made on a mere show of hands. It would be necessary to appraise the votes according to the advancement and culture of the voters. Thus to the verdict of civilized and intellectual nations would be accorded a value many times greater than that allowed to races barbarous and unenlightened. And, among individuals, there would be decreed a vote value to the artist and the poet outweighing that of many less sensitive souls. Proceeding in this manner there is no doubt the proposition would be carried by an overwhelming majority. That is to say, it would be established as a fact upon the same basis upon which alone science admits facts to be at all established, viz., upon that of human perception and experience. Of course it is not for a moment supposed that the process just roughly indicated could be carried out in detail. I have merely endeavoured in some sort to define the kind of testimony upon which facts of this order implicitly found themselves and by which they are continually buttressed into additional security of acceptance.

(*To be continued.*)

* This is certainly an obscure point, since, although Mr. Darwin has pointed out an apparent relation between sexual attraction and beauty among birds, there is still lacking any proof that the category of beauty exists in the mind of any being lower than man.

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

Assistants' Section.

The fourth meeting of the present session was held in the Andersonian College, on Wednesday evening, 27th February; Mr. William Simpson, President, in the chair The minutes of last meeting were read and approved of, after which Mr. W. P. Blain read a paper "On the Sea." The author treated the subject more in a literary than a scientific manner, and at the close referred to the many chemicals that are contained in sea water.

After a few remarks by some of the members, a hearty vote of thanks was awarded to Mr. Blain for his paper.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

On Thursday evening, March 7th, a lecture was delivered at the rooms of the above Association, Halford Street, by Mr. J. Young; subject, "The Telephone," Mr. J. E. Weatherhead occupying the chair.

The lecturer in explaining the meaning of the word "telephone," stated that though it is new to the public the name was old, the 'Imperial Lexicon,' which was printed many years ago, giving the word telephonic. The history of the telephone up to the present time was narrated, the lecturer giving Professor A. Graham Bell credit for having introduced the metal diaphragm, by which the vibrations of any sound can be reproduced. The difference between the working of Bell's telephone and the "pill box" telephone was described. In the latter, the actual vibrations were transmitted through the cord from one box to the other; but in the former, the sound or vibrations did not pass through the wires, but the magnetic influence formed by the vibrating diaphragm at one end affected the diaphragm at the other end, thus giving out the same number of vibrations as received. The construction of the telephone was made very clear by the lecturer putting the parts together in the sight of the audience, and by drawing on the black board. The difference between hard and soft steel, and the bar magnet being permanently magnetized was fully explained and illustrated. The talking phonograph was also alluded to, as being an instrument invented by an American, by which sounds can be preserved or registered, and let out of the machine as required. Thus a person speaking into the box can have his speech reproduced in his exact voice, even after his death, so that it was not only possible to have the image or photograph of a departed friend preserved, but his exact words and voice. The telephone was then put into practical use, a wire having been put in connection with a room some distance off.

The usual votes of thanks were given to the lecturer and chairman, and suitably responded to, the audience then dispersed, it having been one of the most successful meetings that the Association has had for some time.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, March 7th; Dr. Gilbert, Vice-President in the chair.

After the confirmation of the minutes of the preceding meeting, the following certificates were read for the first time:—G. H. Rutter, R. H. Jude, A. K. Huntington, K. H. C. Nevile. The name of Mr. M. Zingler, whose certificate was read for the first time on February 7th, was accidentally omitted in the report of that date.

The list of the officers proposed for election on March 30th was read from the chair. The names of those who will retire, etc., were given in the report of the last meeting, with one exception, that Mr. C. E. Groves retires from the Council instead of Professor R. V. Tuson. It was also announced that Mr. Hall was prepared to receive subscriptions (of 10*s*) from Fellows for the next volume of the 'Proceedings of the Royal Society.

The Chairman then called on Mr. PERKIN to read his paper—

On some New Derivatives of Anisoïl. Dry precipitated methylorthoxyphenylacrylic acid is placed in contact with hydriodic acid, sp. gr. 1·94 for two or three days, the mixture being frequently agitated; the resulting product drained by a filter pump, and then added in small quantities to a cold saturated solution of sodium carbonate, great care being taken to prevent any rise in temperature. The milky fluid thus obtained is distilled, orthovinylanisoïl separates from the distillate as an oily layer. It polymerizes so quickly as to prevent the correct determination of its boiling point, which is about 195°–200° C. Heated for an hour to 150° it solidifies to a transparent glass-like substance. The odour of orthovinylanisoïl differs from that of its isomer paravinylanisoïl, and resembles coal tar naphtha. Sp. gr., at 15°, 1·0005 at 30°, 1·000.

By a similar process, substituting, however, hydrobromic acid, ortho-allylanisoïl was obtained, boiling without polymerizing, at 222°–223° C. It is a highly refracting liquid, with sp. gr. at 15°, ·9972. Similarly with hydriodic acid orthobutenylanisoïl was obtained, boiling at 232°-234°, sp. gr. at 15°, ·9817.

In a previous paper the author described how he had endeavoured, without success, to prepare paravinylanisoïl from methylparoxyphenylacrylic acid by treating with hydrobromic acid, etc. By substituting hydriodic acid he has obtained this substance, resembling in its properties the body prepared by distilling methylparoxyphenylacrylic acid; its fuming point was, however, + 3° instead of —1°; sp. gr. at 15°, 1·002. In conclusion, the author compares the ortho and para compounds as regard their physical properties.

1. *Boiling Point.*

6 Paravinylanisoïl	204°-205°.
Ortho	Uncertain.
Paraallylanisoïl	232°.
Ortho	222°-223°.
Parabutenylanisoïl	242°-245°.
Ortho	232°-234°.

2. *Specific Gravity.*	At 15°	At 30°
Paravinylanisoïl	1·0029	·9956
Ortho	1·0095	1·000
Paraallylanisoïl	———	.9852
Ortho	·9972	·9884
Parabutenylanisoïl	———	·9773
Ortho	———	·0740

The ortho compounds refuse to crystallize even when placed in a freezing mixture; the para bodies crystallize freely.

α methylorthoxyphenylacrylic acid from coumarin, treated with hydriodic acid and then with an alkaline carbonate, yields an oil which is apparently identical with the orthovinylanisoïl prepared from the β acid. The author is engaged in the investigation of this acid.

The next paper was also by Mr. PERKIN, and was entitled

Note on the Action of Amonnia on Anthrapurpurin.—In a previous paper the author mentioned that an ammoniacal solution of anthrapurpurin changes to an indigo blue colour when heated in a sealed tube to 100° C. Hydrochloric acid throws down from this solution a dark purple precipitate, redissolving in ammonia to a blue solution. This substance dyes alumina mordants a purple, and weak iron mordants an indigo blue colour. On examining this substance it proves to be unstable, easily resolvable into anthrapurpurin. If the solution above mentioned be heated in a sealed tube to 160°-180° instead of 100° a purple solution results. On acidifying with hydrochloric acid a chocolate-coloured precipitate forms. This, when boiled with barium hydrate (after washing), dissolves to a purple solution; on acidifying a precipitate is formed. This, after washing and drying, is dissolved in alcohol, on concentration, the dark red solution yields dark greenish or black crusts. This substance the author proposes to call anthrapurpuramide or amidoalizarin; it has the formula $C_{14}H_9NO_4$. It does not dye mordants. By the action of nitrous acid isoanthraflavic acid was obtained.

After some remarks by Dr. Witt and Dr. Armstrong, the thanks of the Society were given to Mr. Perkin for his communications. The Chairman then called on Mr. G. S. Johnson to read a paper

On Certain Polyiodides.—In December, 1876, the author described the compound KI_3. As the mercury compound $Hg I_6$ is well known, it seemed probable that the true formula might be K_2I_6, and, if so, that substitution compounds might be obtained by displacing one atom of potassium by one atom of some other monatomic element. Silver was the element first tried; $AgK_3I_{12}KI+5H_2O$ was however the only salt the author succeeded in isolating. It is efflorescent over strong sulphuric acid but deliquesces in air. It can be recrystallized by dissolving in a small quantity of water and evaporation over sulphuric acid. The crystals present a stepped arrangement, are almost black, with a peculiar lustre; an excess of water decomposes the salt. The author next endeavoured to prepare the compound, $K_2Tl_2I_{12}$, but without success, the only compound obtained being that discovered by Willm, TlI_3KI+2H_2O. Before the isolation of potassium triiodide, Biffard supposed that the solution of iodine in aqueous potassium iodide contained a definite periodide, because it gave a dark coloured precipitate with a solution of acetate of lead. By using alcohol as a solvent instead of water, the author obtained a crystallized compound, a specimen of which was exhibited, not deliquescent, crystallizing in square prisms. By gradual evaporation, fairly large crystals were obtained with six faces, two having a dark purple, and four a greenish golden reflection. The compound can be recrystallized from hot alcohol. Sp. gr. 3·084. Analyses of the constituents led to the complicated formula, $Pb_8C_{36}H_{54}O_{28}K_6I_{17}$. The author has not yet been able to suggest a rational formula.

The next paper was—

On an Improved Form of Wash Bottle. By T. Bayley. To prevent the reflux of steam or other gases, such as ammonia, etc., into the mouth of the operator, the author suggests the following modification of the ordinary wash bottle. The mouth piece is provided inside the bottle with a Bunsen valve, *i.e.*, a piece of indiarubber tube with a slit, a third tube is inserted in the cork, having two T tubes outside the bottle, the ends of these Ts are connected by a piece of caoutchouc tube which can be closed by pressure. The orifice of this third tube between the two Ts is closed by a small cork. The only connection therefore, passing outwards, between the inside of the bottle and the atmosphere, except by the washing jet, is through the indiarubber tube connecting the two Ts. The operator blows in through the Bunsen's valve, closing the said indiarubber tube by pressure; as soon as he ceases blowing, the valve shuts and prevents any reflux, whilst he can by taking off his finger from the indiarubber tube, stop the action of the washing jet, or by keeping the pressure on continue the action for nearly a minute. This third tube also serves to pour out water when the bottle is reversed. A sketch of the arrangement accompanies the paper.

The last paper was—

On the Preparation of Glycollic Acid. By R. T. Plimpton. The author made two attempts to prepare calcium glycollate by following the directions of Professor Church, *Journal of the Chemical Society*, series 2, vol. I. 2 lbs. of granulated zinc, and 2 oz. of oxalic acid were used in each operation. Some needles resembling calcium glycollate were obtained, but the quantity was too small for analysis.

The Society then adjourned to March 21, when papers on Aromatic Nitrosamines, by Dr. Otto Witt; on a New Process for the Volumetric Estimation of Cyanides, by J. B. Hannay; and on Certain Bismuth Compounds, by M. M. P. Mulr, will be read.

Parliamentary and Law Proceedings.

Prosecution under the Pharmacy Act.

At the Marlborough Street Police Court, before Mr. Newton, in the cases of Pharmaceutical Society of Great Britain *v.* Mackness, and the same Society *v.* the London and Provincial Supply Association, Limited, Mr. Flux, Solicitor of the Society, appeared on Tuesday, the 12th inst., in support of three summonses, which he said could be taken together or separately.

Mr. Sanders, who appeared as counsel for the defendants, said he preferred taking them separately.

Mr. Flux suggested that the evidence given in one should be applicable to the others, so as to avoid repetition, to which Mr. Sanders assented.

Mr. Flux then said that the first summons was taken out under the Pharmacy Act of 1868, the 31 and 32 Vic., cap. 121, sec. 17. There were other sections which Mr. Sanders might desire to call attention to, but he thought they were hardly material. He then read the section which is the one requiring that all poisons sold shall bear the name and address of the seller.

Mr. Sanders said he would save Mr. Flux any trouble in this matter by admitting that his client had involuntarily committed a breach of this section, but there were certain facts he wished to bring to the attention of his worship which he thought would influence his judgment. His client had been for some time carrying on a very large business at 113, Tottenham Court Road, where although he designated the business the London and Provincial Supply Association, he himself, down to February was the sole proprietor; and it was whilst he was sole proprietor this breach of the Act took place. It was quite involuntary on his part, for he engaged a properly qualified pharmaceutical chemist as his assistant, but of course he was responsible for anything he did. The penalty for such a breach of the Act as had been committed was £5, or any lesser sum the magistrate might think fit to impose, but there were circumstances in this case which he believed would induce his worship to inflict only a nominal penalty.

Mr. Newton said he understood the summons was for selling oxalic acid without distinctly labelling the cover or wrapper within which the poison was contained with the name and address of the seller of the poison.

Mr. Sanders said, yes; that was an offence under section 17, but he wished to draw attention to something which came under section 15, which was, in point of fact, the same act of negligence for which Mr. Mackness had already paid the penalty, and then he would leave his worship to judge. His client was the subject of an application from Mr. Flux with reference to a breach of the 15th section for acting as a chemist and druggist without being a member of the Pharmaceutical Society; he was not convicted, but steps were taken with reference to an information leading of course to conviction. It was the same transaction, although under two different sections. On the 14th of January the letter which he was about to read was written, and this information was laid on the 5th of March, with reference to a breach of the Act committed on the 28th of December. Between those times, viz., on the 14th of January, Mr. Mackness received from Mr. Flux a letter saying that by having on the 28th of December, 1877, sold oxalic acid, a poison, and acted as a chemist and druggist without being on the Register of Chemists and Druggists he had incurred a penalty of £5 (that was the penalty under section 15), payable to the Pharmaceutical Society of Great Britain, under the provisions of the Pharmacy Act, 1868, and by having sold the same poison without having caused it to be labelled with the name and address of the seller (which would be an offence under section 17), he had also rendered himself liable to other penalties, and that as solicitor for the said Society he applied to him for the above-mentioned penalty, and unless the same with 5*s.* costs were paid forthwith he should sue for the amount. He also mentioned that the fact of trading as a chemist and druggist was a continued infringement of the law respecting the sale of poisons, and that if he continued to do so that would be pressed against him, and so on.

Mr. Flux: So far as may be necessary to secure obedience to the law.

Mr. Newton: Let me understand, did you write that letter with the intention of Mr. Mackness paying the £5 without a hearing?

Mr. Flux said the penalty was to be sued for in a civil action in the county court.

Mr. Newton: Did you write that letter intending the £5 should be paid on the receipt of that letter?

Mr. Flux replied in the affirmative.

Mr. Newton: Then I think you acted wrongly.

Mr. Sanders said he believed it was an act for which Mr. Flux could be indicted.

Mr. Newton said he considered Mr. Flux had acted very wrongly.

Mr. Flux said perhaps his worship would hear him on that point.

Mr. Newton said Mr. Flux had no right to put a pistol to a man's head, which it was, and say unless you give me £5 I shall fire the pistol off.

Mr. Flux trusted his worship would hear him on that point more in detail. These penalties were to be recovered in the county court.

Mr. Sanders said that any penalties recovered under this Act were to be paid to the Commissioners of Her Majesty's Treasury, when they were recovered in the county court, but when they got them in this way they put them into their own pockets.

Mr. Flux said they dealt with them as the Commissioners of the Treasury directed.

Mr. Sanders said it was really an act of extortion on the part of Mr. Flux, though he did not suppose he intended it to be so. Of course Mr. Mackness, feeling he was in the wrong, consulted his solicitor, who told him he had no doubt violated the Act of Parliament, and that he had better pay the £5, and the 5*s.* for the application. That in point of fact was the same transaction as the one for which he was now summoned, and it had been advertised as being the recovery of a penalty. Now there had been no recovery of a penalty, but it was voluntarily paid without contesting the matter. Under these circumstances he hoped his worship would be of opinion that his client had substantially paid for his neglect, and that he would not visit him with any further penalty.

Mr. Newton said he did not see how Mr. Flux could very well go on, having taken the step he had.

Mr. Flux said the considerations which had now been urged upon his worship had in other cases—before other magistrates—

Mr. Newton said he must request Mr. Flux not to refer to other cases or other magistrates before him. Each case which came before him was dealt with on its own merits.

Mr. Flux asked leave to draw his worship's attention to the fact that the penalty of £5 to which his letter referred was a penalty recoverable only in a civil action, and not in a police-court, and that as to the mode which he, as solicitor for the Society, took to recover penalties in civil actions he was exposed of course to the remarks of judges of the county court, and in his conduct with regard to these civil proceedings he had had distinct regard to the emphatic utterances of the learned judges who had impressed upon him that in such suits in which both sides were exposed to the costs of the action, the proper, ordinary, and courteous course to be adopted by a solicitor was to send a letter before action, and upon the letter asking for payment the penalties then recovered were distinctly accounted for and dealt with under the Act of Parliament.

Mr. Newton: Surely not a letter with a threat.

Mr. Flux replied it was the common letter before action.

Mr. Newton said he had only heard the letter read casually.

Mr. Flux said he would hand up to his worship a copy; it was the ordinary form of solicitor's letter before action.

Mr. Newton said he set his face against that kind of thing and always should do so.

Mr. Sanders remarked that Mr. Flux had no right to the amount unless it was recovered.

Mr. Newton again repeated that he did not see how Mr. Flux could come for a penalty for selling this on the 28th of December having already recovered £5 for it.

Mr. Flux said the penalty of £5 already paid was for carrying on the business of a chemist and druggist in infringement of certain clauses in the Act of Parliament, whilst the penalty for which the accused was now pressed was a penalty for the protection of the public in regard to the manner, not to the person, but the manner in which the sale was conducted. The law said that certain persons and only certain persons could lawfully sell poisons, but if persons not selling lawfully do sell they should be liable to a penalty of £5 to be sued for in the county court.

Mr. Newton said the letter distinctly said unless you pay me £5 and 5*s.* costs, I shall immediately recover that money from you. If that was not a condonation of anything that had occurred up to that date he never heard one.

Mr. Flux said that was for the above mentioned penalty of £5.

Mr. Newton considered it was for everything done up to the 14th January. If he had intended to sue under this section he should not have written this letter.

Mr. Flux said there were two separate penalties under two separate clauses. In the one case it was to be sued for by the institution designated—a corporate body; in the other it was a matter of criminal penalty, to be pressed for at the instance of a prosecutor.

Mr. Newton said he should not have written that letter if he had intended to take further proceedings for what occurred on the 28th of December.

Mr. Flux said if this gentleman had not further offended against the Act of Parliament they would not have further pressed him.

Mr. Newton said the case would have stood very much better if they had not taken out the summons for what occurred on the 28th of December.

Mr. Flux said he had submitted all the considerations which arose on the case, but he would ask his worship to reserve his decision for the present until he had heard the other summonses.

Mr. Newton said he would hear the second summons, which was for having sold poison on the 4th February without distinctly labelling the wrapper in which such poison was contained, namely, red oxide of mercury, with the name and address of the seller.

Mr. Flux said the red oxide of mercury was not in the schedule to the Act itself; but the Act contained power for the Privy Council and the Pharmaceutical Society by concurrence and notice in the *London Gazette* to add to that schedule of poisons, and this red precipitate had been so added, as he could prove by the original *London Gazette.*

Mr. Sanders said he would admit that the red precipitate was a poison within the meaning of the Act, but he should like to know the date of the *Gazette.*

Mr. Flux said it was December 2nd, 1869. He had witnesses who could prove it if necessary.

Mr. Joseph Brooker Ward was then sworn and examined by Mr. Flux. He resided at 24, Avenue Road, Clapton, and was clerk to Messrs. Flux and Co. On the 4th February, 1878 he attended at 113, Tottenham Court Road, the same address at which he had purchased the poison mentioned in the earlier summons. He went to the counter, which had the appearance of being an ordinary chemist's counter, being fitted up with bottles and so on, like a chemist's shop. He did not notice any writing or inscription that he remembered; he thought he read the word "dispensing," or something of that kind. He saw a person who he afterwards found to be Mr. Longmore, and asked him for a small quantity of red precipitate. He supplied him with a small packet (produced). Witness asked how much it was, and he stated 2*d*. That was labelled "Red Precipitate. Poison. London and Provincial Supply Association, 113, Tottenham Court Road, London, W. H. E. Longmore, Chemist and Druggist." That label corresponded with the label on his earlier purchase, with the exception of the difference in the name of the article.

Mr. Newton thought he said he had only purchased red oxide of mercury on the 4th of February. Then he could not go into the oxalic acid question.

The Witness continued: He kept the article in his possession until he handed it to Professor Attfield for analysis.

Mr. Sanders said he would admit that the article was a poison, but he did not exactly comprehend the nature of the complaint made. What was the objection to the label?

Mr. Flux: That Mr. Mackness did not label it with his name and address.

Mr. Sanders: He did not buy it of Mr. Mackness, he bought it of Mr. Longmore.

Mr. Flux said Mr. Mackness admitted it was his business.

Mr. Sanders said Mr. Mackness admitted nothing.

Mr. Flux to the Witness: Had you previously ascertained that Mr. Mackness was the proprietor?

Mr. Sanders objected to the question.

Mr. Flux: Had you previously purchased poison at the same premises?—I had.

Had Mr. Mackness admitted that he was the seller of the poison?

Mr. Newton: Stop, that will not do, you must shape your question in another way.

Mr. Flux: Had you any means of knowledge as to who was the proprietor of the shop?—I had from the solicitor of Mr. Mackness. His clerk called on me and told me.

Mr. Sanders objected.

Mr. Newton: That is merely hearsay.

Witness: Since then Mr. Mackness himself has admitted he was the proprietor.

Mr. Newton: Admitted will not do, you cannot say he admitted. What did he say?

Witness: He had a long conversation with me and told me how this institution of his had grown up from a small business, and that his father had found him the money to go into the business and to carry it on, and that Mr. Longmore was a servant of his.

Mr. Sanders said this summons appeared to be addressed to Mr. William Mackness and the London and Provincial Supply Association by their secretary Polley; whom did he go against?

Mr. Flux said against both. Mr. Mackness had by his counsel to day admitted that he was the seller.

Mr. Sanders said the remarks he made previously had reference only to the 28th of December.

Mr. Newton said here was a poison sold admittedly by Mr. Longmore, a chemist and druggist, 113, Tottenham Court Road.

Mr. Sanders: Every requisite of the Act being complied with.

Mr. Flux said that sale was a sale by Mr. Mackness according to the admission of his own counsel.

Mr. Newton: That was the sale in December.

Mr. Flux: Which was the very foundation of the proceedings against him.

Mr. Newton: Then I think I see my way pretty clearly; if you have nothing else but that, because you have obtained £5 from Mackness by means of writing that letter, you propose to prove that Mr. Longmore is not a chemist and druggist, that is what your case must be.

Mr. Flux: Not the seller.

Mr. Newton said Mr. Flux had proved that Mr. Longmore was the seller.

Mr. Flux replied that Mr. Longmore was simply the paid servant of Mr. Mackness, as was admitted.

Mr. Newton: That is just what it is not. You are so fond of that word "admitted." There is no such thing as admitted, particularly in a criminal court. The witness has said that Mackness told him he had that shop and that Longmore was his servant. This poison was sold by Longmore who was within the words of the Act.

Mr. Flux said he had a letter from Mr. Mackness's solicitor of the 30th of January admitting that he was the proprietor of the business, because he said he had sold, and a man could not sell a thing of which he was not proprietor.

Mr. Newton asked Mr. Flux if he had looked at the 15 and 16 Victoria, the 12th and 14th sections.

Mr. Flux said he did not know that that had any bearing on the matter. He did not dispute that Mr. Longmore was on the Register.

Mr. Newton said he was the seller.

Mr. Flux submitted the Act of Parliament said, "That the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller." That was clause 17.

Mr. Newton said Mr. Longmore did sell.

Mr. Flux: He sold as a servant.

Mr. Newton: He is a servant, therefore he comes within the two; he is the servant and the seller.

Mr. Flux: If a servant sells, the person on whose behalf he sells is liable.

Mr. Newton: It says the servant shall be called the seller, or the apprentice shall be called the seller.

Mr. Flux submitted that a reperusal of those words would show that was not the meaning.

Mr. Newton: It strikes me as being beyond all dispute.

Mr. Flux: That the servant shall be deemed to be the seller?

Mr. Newton: Yes, read it again. It is sold by Longmore, as the seller.

Mr. Flux submitted that Longmore was the servant of Mackness, selling in Mackness's premises and nothing else, and admittedly so.

Mr. Newton: No.

Mr. Flux said that being the case and Mr. Longmore being present be would put him in the box.

Mr. Sanders said the meaning of it was that a person should not shelter himself under these penalties by saying he does it by a mere servant or apprentice, but here there was a qualified person.

Mr. Flux said if a grocer employed a duly admitted solicitor that did not justify a grocer in carrying on the practice of a solicitor.

Mr. Newton: No, but according to what Mr. Flux had admitted Mr. Longmore was a member of the Society.

Mr. Flux: Not a member of the Society but a chemist and druggist; he was on the Register, in the same way as any solicitor would be on the Rolls of Solicitors, but that would not authorize any person not on the Rolls to carry on practice.

Mr. Newton said this man, being on the Register, he would be qualified to become a member of the body.

Mr. Flux said he was qualified to carry on business for himself, but not to carry on business for a person who was unqualified. He submitted the theory of the Act of Parliament was that the public should be protected in regard to the matter of sales, and that on every article sold they should have the name and address of the person against whom, in case of injury, an action would lie, or who, in case of neglect, would be liable to a prosecution for manslaughter.

Mr. Newton said the person who was put at the head of this department of the store was a person admittedly capable of doing that which he was asked to do, namely, sell poisons.

Mr. Flux said if he were conducting the business on his own account he would be qualified to sell poison.

Mr. Newton said the Act was passed to prevent unqualified persons selling poisons. It so happened this man was a qualified person.

Mr. Flux: But the Act of Parliament requires the name and address.

Mr. Newton did not think the Act of Parliament ever intended this case. It seemed to him rather a case of oppression.

Mr. Flux said if his worship would follow out the third case, he would see what gross negligence occurred, and the third case took place before any proceedings were taken. When he found that oxalic acid was sold in a screw of paper as if it were so many lollipops, then his clients, being charged in some degree with the carrying out of this Act of Parliament, felt they would be guilty of gross neglect of duty to the public if they allowed it to pass.

Mr. Newton: Do you not think the real object of this prosecution is to stop the sale of drugs at this particular place?

Mr. Flux said it might have that effect.

Mr. Newton: That is your object in bringing these proceedings here?

Mr. Flux said when his worship saw the third case he thought he would see the other was the motive, and that there had been a very flagrant case indeed.

(Mr. Henry Edward Longmore was sworn).

In answer to Mr. Flux he said: I live at 10, Storey's Gate, St. James Park. I lived there on the 4th February last. That was my address on that day; I had no other.

What were you on that day, a master-man or a servant? —I was a master-man. I was a partner in the firm of the London and Provincial Supply Association.

What do you mean by a partner?—A shareholder. I was a shareholder on that day. I cannot tell you the date when I became a shareholder; if you look at the minute books you will see.

Mr. Flux: Are the minute books produced?

Mr. Newton: No, you have not given them notice to produce; you must carry out these things if you are going for a criminal prosecution, which this is, according to law. I cannot permit you to go one bit out of the line. I never do permit anybody if I can stop him.

Witness continued: I will pledge my oath I was a shareholder on that day. I hold five £10 shares. I was drawing a salary. I was a paid servant at that time of the company. The business at 113, Tottenham Court Road belonged on that day to the London and Provincial Supply Association. It was a registered company, as far as my knowledge goes, and I believe was incorporated. It was a Limited Company.

Then the word "Limited" was part of its name?—Certainly it was.

Is that the company (handing a document to the witness)?—I do not know. I know the signature of Mr. William Mackness. I think it is his signature.

Will you swear you were a shareholder prior to the 20th of February?—If you refer to the minute books of the Society you can see; it is a question I could not swear to, but to the best of my knowledge I was.

Do you know when any change of ownership took place?—When we received notice from you that we were doing wrong, and that fine was paid.

Were you engaged by Mr. Mackness originally?—I was engaged by Mr. William Mackness originally. There was a change in the arrangement when I was made a shareholder and when I took shares.

You said you were a salaried servant at that date, being a shareholder did not alter that?—One's salary need not be altered because he takes shares in an association.

Then you mean there was no new agreement, but you went on?—There was a consideration that need not be mentioned, as it does not relate to the present case.

There was a consideration for which you became a shareholder?—Quite so.

But was there any change made in your hiring?—No.

Or in the conduct of the business?—The conduct of the business was this, everything of course was bought by the manager, Mr. Wm. Mackness, the acting manager, I may say, of the Association.

Look at those two packets; do you recognize that label?—I do.

Look at the other one.

Mr. Newton: I thought you were upon the third summons.

Mr. Flux: Upon the second summons.

Mr. Newton: Does that relate to the second summons?—This is the original summons.

Mr. Flux: You recognize that label?—I do.

Do you recognise the other?—I cannot recognize that because it is partly torn off. I wrote the "red" written underneath the "white," and the white being scratched out is my writing.

In fact on the 4th February you used labels which had previously been in use?—Yes.

And the London and Provincial Supply Association, Limited, was your employer on the 4th February?—You asked me that before, and I have answered it.

How?—I said I could not tell you at the time but to the best of my belief it was.

If any company it was that?—I think so. I referred you to the minute books I think.

If you will produce the minute books?—You should have asked for them; your clerk has seen them already.

I should like to see them.

Mr. Sanders: Have you given us notice to produce them.

Mr. Flux: No. I do not want to see your minute books, but if the witness says "Refer to the minute books and I will tell you," he may refer, and then I shall see them.

Mr. Sanders said he had nothing to ask Mr. Longmore.

Mr. Flux submitted that against either one or other of these parties, Mr. Mackness or the company, there must be a conviction. He had shown that Mackness was the proprietor of the business in December, that certain labels were used and a continuation of the same labels on the 4th of February, the date of this summons. If it could be said that this chemist was the seller there was an absence of his address from the label. He submitted that the Act of Parliament was clear; that although this chemist had conducted a business it was not for himself; he was, according to his own admission, a paid servant, and then he was within the 17th clause.

Mr. Newton said he was a shareholder, a part proprietor.

Mr. Flux said there were plenty of decisions that shareholders were not part proprietors; that the ethereal thing called the company was the proprietor, and that the share was an ethereal thing and the holder of it was not part proprietor. But then if he as a shareholder put his name, he represented the company, and he as a shareholder should have put his own address as well as name on the label. But if it were the company—which came to a certain extent as a matter of surprise, seeing the continued use of the label—then there was this fact that although it continued the name the London and Provincial Supply Association, the word "Limited" as part of the name, so as to give the public a knowledge that the company was registered as a limited company and was the institution against which he could proceed, was not there.

Mr. Newton: How would you have them label their poisons?

Mr. Flux: London and Provincial Supply Association, Limited, 113, Tottenham Court Road.

Mr. Newton: Then because they omitted the word "limited" and put in "Longmore, Chemist and Druggist," you say this is insufficiently labelled. I want to understand your position.

Mr. Flux: Technically that is so.

Mr. Newton: I think that is a mere splitting hairs, if you admit the fact, pardon my saying so, that they have a right simply to call themselves London and Provincial Supply Association, Limited, and you would not object to that.

Mr. Flux: If the sale had been conducted for that company.

Mr. Newton: But it was conducted for the company.

Mr. Flux: If your worship so thinks, then my point stands upon that only, that they have not got their name there, that they have only got a part.

Mr. Newton: Is that all you submit to me?

Mr. Flux said he had nothing to add on that case, but the third was a most serious one.

Mr. Newton: Very well, let me hear the third case.

Mr. J. B. Ward, recalled said: On the 20th February, 1878, I went to 113, Tottenham Court Road; the external and internal appearance of the place was the same as before. I went to the same counter and asked for a small quantity of oxalic acid. The person asked how much, twopenny-worth? I said, yes, that would do, and he took some from the drawer and handed it to me. It was done up in one paper with no label whatever. He took a pen and wrote on it "Oxalic Acid, Poison." I put it in my pocket and then went to see the Secretary.

Mr. Newton: He knew who you were?—He did not.

Who was the man who served you?—I do not know, he was a stranger to me, I had never seen him before, and have never seen him since.

But he might have seen you?—I don't think he had, because I have reason to believe he was a new servant.

Mr. Flux: Do you produce the packet?—I do. Having made that purchase I went to a gentleman who I thought—

Mr. Newton: That will hardly do.

Mr. Flux: It was to the Secretary, who is summoned.

Mr. Sanders: No, he is not summoned, it is the London and Provincial Supply Association, Limited.

Mr. Flux: By their Secretary, Arthur Polley.

Mr. Newton thought Mr. Flux had enough evidence for his purpose.

Cross-examined by Mr. Sanders: It was about the middle of the day I went. I do not think it was dinner time. It was very late for dinner, between two and three. I expected to find Mr. Longmore there; I rather hoped to find him. I went primarily to search the register of shareholders. I purchased it to see if they were still infringing the Pharmacy Act. I had no use for the acid myself.

You bought it to get a case against the parties?—I certainly did it to see if they were still infringing the Act.

You of course were perfectly well aware of the provisions of the Act?—Very well aware.

It never occurred to you to tell the man to put his name upon it, or his master's name?—Certainly not.

Why did you not; did you want the man to commit an offence?—I did not wish him to commit an offence.

Why did you not tell him you ought to put your name upon this or you will be exposed to penalties?—I did not think of it.

You were glad of an opportunity of laying an information?—No, I rather hoped to get something different.

You have no reason to give why you did not tell the man, by way of caution, that he ought to put his name?—I have done such things before, it did not strike me that it was necessary to do so. I afterwards found out he was a registered chemist.

Did you not observe he was not the usual man who served in the shop?—I observed it was not Mr. Longmore.

Did you ask for Mr. Longmore?—No, I asked for Mr. Polley.

Mr. Newton: Would it not be dangerous to leave a mere stranger in the shop.

Mr. Sanders said in point of fact it was nothing but a mistake.

Mr. Newton said there was no mistake here he was afraid.

Mr. Sanders said he believed this man was instructed not to sell poisons, but merely to mix up and compound prescriptions. The word "poison" was written upon the packet, so that it was a technicality rather than a matter of substance; it was not likely to mislead any one. The great thing was that it had the word "poison" on it.

Mr. Newton asked if it was a man who sold it.—The witness; Yes; I believe he was a registered chemist and druggist, because in conversation with Mr. Mackness and Mr. Longmore about it—

I only asked you one question, was it a man or a boy?—It was a man.

Mr. Sanders: Did you notice he was searching for a label and could not find one?—I do not think he was. I will not swear positively. He wrote that himself.

Mr. Newton: What did you pay for it?—2*d*.

At an ordinary chemist's what do they charge for it?—About the same price, I suppose. I do not know.

Mr. Sanders said that was all he had to ask.

Mr. Flux said he would call Dr. Attfield to prove that the contents of the packet were oxalic acid.

Mr. Sanders said he would not dispute that.

Mr. Flux: Then I will not trouble your worship further.

Mr. Newton said he did not see what answer Mr. Sanders could make to this summons.

Mr. Sanders said he would make this answer in the first place, which, if necessary, he would have proved; but it was already admitted, that this was a limited company, and was addressed in that capacity.

Mr. Newton said if there were any technical objection of that sort he would alter it in a minute by a stroke of the pen. He would not advise Mr. Sanders to take that point.

Mr. Sanders said he did not wish to make objection of a technical kind, but he submitted as it was a corporation it was not amenable to these proceedings; that a corporation could not be sued either by indictment or by summary information; that in point of fact a corporation had no identity, no individuality.

Mr. Newton: Do you hold yourself above all law, then?

Mr. Sanders: No. If an Act of Parliament specifically applied, if it said "any person, or any corporate body," it would be different.

Mr. Newton asked if he meant to submit that they could not do anything criminal because they were a body corporate. Suppose they infringed the law by selling adulterated milk, or, as in this case, by selling poisons.

Mr. Sanders said the difficulty amongst other things would arise in the process; for instance, how would his worship carry out any penalty?

Mr. Newton said if they did not pay the penalty he should sent his warrant officer to seize their goods to the amount.

Mr. Sanders: And suppose there were no goods to seize, what would be the ultimate remedy? his worship could not commit anybody to prison.

Mr. Newton said he should see about that. He thought he could find somebody to do it.

Mr. Sanders thought the thing would be impossible.

Mr. Newton said he hoped that eventuality would not occur. He understood the point was that the words in the Act of Parliament were "any person," and the question was whether "person" would include a corporate body.

Mr. Sanders did not think his worship would find in any law-book or any treatises any dictum which would go to that extent. A corporation could not be sued as an individual. A very good description was given of a corporation in Blackstone's Commentaries; it is "an invisible body, existing only in the intentment and consideration of the law."

Mr. Newton: Cannot you indict a railway company?

Mr. Sanders: Yes, under an Act of Parliament. There are provisions there that that shall be done, but here they were under the common law, and the Act of Parliament gave no remedy against a corporation.

Mr. Newton said when the Act of Parliament was passed no one had any idea that corporate bodies were going to sell drugs.

Mr. Sanders said very likely it was a *casus omissus*.

Mr. Newton said he thought he could settle it, and let Mr. Sanders take a case if he was wrong, which would at once put it right. The short point he had to determine was whether under the Pharmacy Act, 1868, a "person" included a corporation, and whether they could be sued for penalties under the 17th section.

Mr. Sanders said that was the point. If his worship had a strong opinion upon it he would not argue it further.

Mr. Newton said he had not a very strong opinion upon it, because he had not thought much about it until now.

Mr. Flux said he had a case under the Truck Act in which a company was convicted, and there the word was "employer."

Mr. Sanders said that was a different thing.

Mr. Newton said if there was anything in the point he should like to have a case taken upon it.

Mr. Sanders said under this Act of Parliament they could not sell poisons unless they were members of the Pharmaceutical Society, but it was impossible that a corporation could be members.

Mr. Newton: Then you have taken into your body a shareholder who is a member of that body.

Mr. Sanders said that would not render the corporation members of the Pharmaceutical Society. Before the passing of this Act anybody might sell poisons under any circumstances without restriction. This Act of Parliament was passed, but the person who drew it did not carry in his mind's eye the whole of the circumstances that would occur.

Mr. Newton: He did not have a prospective view of the Civil Service stores.

Mr. Sanders said the Civil Service stores had been in the habit of selling for years, but this was a joint-stock company. This might very likely be a *casus omissus*, but he did not see how it could be altered as far as these associations were concerned.

Mr. Newton said this was a new point, and he would be much obliged if the two gentlemen would look into any cases that had been decided and come before him again on Saturday next at half-past twelve, because a decision on this case might be of very great importance.

Mr. Sanders said there would be a difficulty in a case being stated under the 20th and 21st Victoria, because he did not see who could enter into the recognizances.

Mr. Flux said upon his side every facility would be given.

Mr. Newton said he could send a case up to the court at once; there would be no difficulty about that.

Mr. Flux said in case anything should turn upon it he should like to have it proved whether Mr. Longmore was a shareholder in the company at the date in question.

Mr. Newton: It is your own witness; you cannot discredit him.

Mr. Flux: But he would not pledge himself as to the date at which he became a shareholder.

Mr. Crouch (defendant's solicitor) said Mr. Flux might take it from him he was a shareholder before that date.

Mr. Flux said he would accept that statement.

Mr. Newton said the doubt had crossed his mind whether Mr. Ward was not perfectly well known to the shopman, and whether the shopman did not know that there was something behind, and sell him that knowing who he was. That was why he asked Mr. Ward the question.

Mr. Flux said there was nothing of the kind.

Mr. Sanders asked his worship to dispose of the two first summonses.

Mr. Newton said he should rather not do so, because if a case had to be drawn up it might be necessary to have all the facts placed fully before the court.

Mr. Flux having given his worship a reference to the case he had mentioned of Weaver *v.* Floyd in the 21 *Law Journal*, page 151, which went up to the Court of Queen's Bench and was decided by Justices Pattison and Whiteman, the case was adjourned until Saturday the 16th, at half-past twelve.

Poisoning by Colocynth.

Mr. Malcolm, the Leeds borough coroner, held an inquiry at the Leeds Town Hall, on March 10, relative to the death of Mary Stead (32), wife of a coal miner, living at 44, Spring Close, Bank. She was taken suddenly ill on Saturday morning, and on her husband calling in Mr. Heald, the police surgeon, she told him that she had taken some bitter apples to procure abortion. She died on Sunday morning after about twelve hours' illness. The deceased bought two pennyworth of bitter apples at the shop of Mr. Thomas Arnold, druggist, Sussex Street. Bitter apples, although a vegetable irritant poison, is not scheduled in the Pharmacy Act. Mr. Heald, on making a *post mortem* examination, found the stomach largely distended, and it and the intestines very much inflamed. He was of opinion that death had resulted from inflammation of the covering of the bowels, caused by some irritant poison, probably bitter apples. Bitter apples was a vegetable poison commonly supposed by women to produce abortion. The woman had had four children, and was two months advanced in pregnancy at the time of her death.

The jury returned a verdict to the effect that the deceased had died from the effects of poison administered by herself, but there was not sufficient evidence to show what was the state of her mind at the time.

Dispensing Memoranda.

[77]. Could any reader inform me of the best mode and excipient for making the following:—

℞ Ferri Sulphatis	gr. xxiv.
Ext. Aloes Aquos.	gr. xij.
Ext. Hyoscyami	gr. xxiv.
Ol. Sabinæ	ℨss.

M. pil. xxiv. Capt. ij. omni alt. nocte.

Thos. F. Elton.

27, *Park Street, Cirencester.*

[78]. The following prescription when dispensed accurately causes a separation of the quinine in a resinous form. I have even seen it collect into one mass, which floats on the surface of the fluid.

℞ Spt. Ammon. Arom.	℥vj.
Potass. Bromidi	ℨij.
Ferri et Quiniæ Cit.	ℨj.
Aquæ	ad ℥vj.

Would it therefore be consistent on the part of the dispenser to send the mixture out in this manner, or to remove the solid by filtration? It, however, must be borne in mind that in neither case would the patient be benefited by the separated quinine, as in the former it would remain in the bottle after the medicine had been taken, therefore the result would be the same as were the dispenser to remove it.

W. A., *Norwich.*

[79]. Would any reader inform me through the columns of the *Pharmaceutical Journal* the reason of a separation in the following mixture, which rises to the top to the extent of half an inch in an eight ounce mixture, and suggest the best means of avoiding it?

℞	Potass. Bicarb.	gr. xv.
	Decoct. Pareiræ	℥j.
Misce ℥viij.		

T. P. B.

[80]. I was handed a prescription a few days ago for a certain quantity of boracic acid ointment, which I prepared according to the receipt published in the Journal some time ago, viz.:—

Boracic Acid Ointment (*Lister's*).

Take of—

Boracic Acid in fine powder . .	1 part.
White Wax	1 „
Paraffin	2 „
Almond Oil	2 „

The ingredients after being mixed by melting the wax and paraffin, are stirred in a mortar till the mass thickens, and then set aside to cool, after which the firm substance is reduced in a cold mortar in successive portions to a uniform soft ointment. This forms an ointment having a very gritty appearance although carefully prepared. I should feel very pleased if any of the numerous readers of the Journal could tell me how to make a smooth ointment of it, or whether they could give a more preferable receipt.

QUERENS.

[81]. Will some one kindly inform me how I can make the following pills hard, what excipient I should use? A firm in Manchester make them quite hard.

℞	Ext. Rhei.	gr. xlviij.
	Ext. Chelidonii	gr. xlviij.
	Quinæ Sulph.	gr. xxiv.
Misce, ft. pil. xxiv.		

J. K. G.

[82]. Will some one kindly tell me the nature of the deposit in the following mixture, and if it is possible to dispense it in such a manner as to avoid it?—

℞	Quiniæ Sulph.	gr. xij.
	Potass. Bromid.	ʒiij.
	*Sol. Acid. Bromohydric.	℥vj.
	Aq. Destill.	ad ℥vj.
M.		

A. H.

Obituary.

Notice has been received of the death of the following:—

On the 21st of February, 1878, Mr. Robert Denoon, Chemist and Druggist, Inverness. Aged 31 years.

On the 12th of March, 1878, Mr. Joseph Hick, Pharmaceutical Chemist, Bradford, Yorks. Aged 56 years. The deceased gentleman had long occupied a prominent position amongst his townsmen, and for nineteen years filled the office of churchwarden. In 1871 he was elected an alderman, and in 1876 was placed on the commission of the peace for the borough, in the discharge of the duties of which office he had had been sitting in the Borough Court on the day of his death, which resulted from apoplexy. Mr. Hick became a Member of the Pharmaceutical Society in 1845.

* Squire's 'Companion,' last edition.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Examination Results.

Sir,—Taking, as I do, a deep interest in everything that pertains to our examinations and their results, I have been watching carefully for some time the various reports presented from time to time to the Council, together with the opinions that have been expressed, both by yourself, Mr. Editor, the members of Council, and other members of the Society, through your correspondence columns, on this subject, and I have come to the conclusion that however qualified our friends south of the border may be to judge of the circumstances as it affects themselves, they certainly fail to understand or appreciate the position of affairs on this side of the Tweed. In the first place I have noticed that there is a lurking suspicion, if not openly expressed, on the part of some of our English friends, that the Scotch Examining Board has been more lenient with the candidates then they should be; hence it (is assumed) the larger percentages of passes supplied from Edinburgh than from London. It is, therefore, gratifying to observe that the members of Council, if not the Examining Board at London, have become so far convinced of their error. I say "so far," for if the Council was thoroughly convinced why this proposal to draft our Scotch Examiners up to assist at the London Board and *vice versâ*? I do trust that our Scotch Board will be firm in resenting this proposal, the time has not yet come when the two Boards may be merged into one, and no doubt this will just be the thin end of the wedge for some such purpose. I think the two Boards, so long as they are kept distinct, are necessary; one way in which I think they do good is in giving young men a choice. It is a fact that many young men when they fail at London come forward the second time to the Edinburgh Board, and this is perhaps one reason why the Scotch Board shows a higher percentage of passes than the London Board; those young men from the South being more successful on their second attempt, for they are not all Scotchmen who present themselves at Edinburgh, as seems to be assumed by Mr. Mackay of Newcastle in his letter of the 2nd inst. I do not think it is possible to get absolute uniformity in our examinations, any more than it can be got in teaching, nor do I think it is desirable. Was it not the uniformity that was supposed to exist in the questions that gave the idea of "cram" such prominence a few years ago? Different examiners will adopt different methods of examining, whether they are English or Scotch, if they have any originality at all, and while it is necessary that our Council should inquire in every possible way into what may look like discrepancies, I trust the members will not go out of their way for the present to make the examinations any more strict then they are.

I cannot conclude without saying a word or two respecting the Preliminary examination and the large number of failures that has been reported of late. I sympathize to some extent with Mr. Duncannon's remarks on this subject in a recent issue of the Journal, and I do not think that his suggestions were deserving the offhand critique you were pleased to bestow upon them. You say that the "quality of the candidates has been far below the requisite standard," but who is the judge of the quality and what is the "requisite standard?" This is just where opinion differs. In legislating for a country such as ours, all circumstances have to be taken into consideration. Acts of Parliament are seldom passed to gratify the whim of any particular set of individuals; the requirements of each locality are weighed, and that law is generally agreed to which is calculated to confer the greatest amount of good on the greatest number. Now I grant that in some places, such as Edinburgh, it may be an easy matter for a section or even a majority of the trade to obtain young men as apprentices fresh from school, who will with perfect ease pass the present Preliminary examination, but looking at Scotland as a whole I say it without fear of contradiction that there is not one-tenth of the chemists here that will say that they can get apprentices at all but with the greatest difficulty, and as for passing the Preliminary before they commence their apprenticeship, the thing is absurd and is never thought of or proposed, far less expected here. The best test, Sir, of the position of affairs is the results, and the results have spoken volumes of late, that the examinations have been too stringent for the class of young men that are presenting themselves.* You may wail about the quality as you like, but we who have the engaging of the lads have to take what we can get, and the Council must regulate the examination questions accordingly, because this continual two-guinea fine will not continue long, and the Pharmaceutical Society's exchequer will feel it in due time. We have seen that some good has resulted from the deputation to the examinations recently held at Edinburgh, and we doubt not that the members of the Scotch Board will benefit from their approaching visit to London, and when this question of deputations is under consideration, might it not be advisable to look forward to extending them even beyond London and Edinburgh. The question of provincial education has not been mastered yet, and there are many other questions affecting the trade at large which must sooner or later be considered by the Council, if, indeed, there is not a crying need already for an amendment of the Pharmacy Act. Before entering on these large questions, might it not be advisable for the Council to appoint a roving commission for a month with power to examine witnesses in all the large centres, and in this way arrive at a correct notion regarding the real wants and requirements of the trade? At present all is hap-hazard.

Glasgow. JAMES M. FAIRLIE.

THE PRELIMINARY EXAMINATION.

Sir,—Your correspondent, "A Preliminary Student" writes like some scion of the aristocracy who has condescended to patronize the trade. But perhaps his shuddering dread of base born mechanics is simply the result of elation, induced by his recent success.

"A Preliminary Student" ascribes the numerous failures to the influx of "mechanics' sons and errand boys, who have received a very limited education, and in some cases scarcely any at all." It is difficult to determine the degree of difference between a very limited education and scarcely any at all, and still more difficult to satisfy one's mind as to the accuracy of the statistics on which your correspondent has based his ninety per centum estimate. However, I suppose "A Preliminary Student" could easily furnish every information with that clearness and precision which are among the results of an unlimited education.

Now taking for granted this "lower class" theory, how to bar the door against their ingress would be a problem worthy of the haughty genius of "A Preliminary Student," and its successful solution would confer upon him more lustre than does his advice to students of the metrical system, whom he recommends to best answer the questions set thereon by learning the questions themselves, for thus writes your correspondent, "the questions given on the metric system . . . could be easily learned by the candidate," etc.

May I be allowed to remind "A Preliminary Student," that after all, the mainspring of business is self interest, and he may depend that such members of the trade as are given to the unfortunate practice referred to are doubtlessly guided in their course by consideration for themselves, being content to leave to the operation of the Pharmacy Act those higher interests which have at best but a remote connection with the chief object of business, which must necessarily be the acquisition of money.

If a druggist finds that his errand boy is likely to be of more service to him than a dilettante young gentleman apprentice, it is probable that the druggist will take the boy into the business, and I for one fail to see why an intelligent youth of good character, whatever the social position of his parents may be, should be debarred by absurd notions of caste from becoming of service to himself and others. No doubt "the Act was passed to get a better qualified class of men," but it nowhere dictates the exclusion of members from any social class, provided the qualifications are complied with.

I entirely agree with "A Preliminary Student" in his remarks about the injustice to passed men and the public, which any lowering of the examination standard would involve, and I deplore the practices which he condemns, but I do not admire the scornful spirit of contempt for the so-called lower classes with which your correspondent's letter is imbued.

"The fewer the better" may be "the best motto for those now in business," but he who would have them adopt it should remember that it admits of practical elucidation by himself. Let him therefore act up to his convictions, and by seeking "fresh woods and pastures new," make the pharmacists of the future fewer and perhaps worse by one.

A REGISTERED STUDENT.

THE PINT MEASURE.

Sir,—Your article last week upon the Weights and Measures Bill, coupled with a letter from Mr. Courtenay in which Aq. dest. Oss., was interpreted as f ℥ x, suggests to me the desirability of calling attention to the anomalies existing among us in the use of the term pint.

Although imperial measure was legalized as far back as 1824, and introduced into the Pharmacopœia in 1836, yet there are still numbers among the medical profession who intend by Oj, f℥xvj. and not a few among ourselves who would dispense it as such.

To come to ordinary trading, the sixth of a gallon wine bottle is still called a pint and a half, and while for a pint of linseed oil or of turpentine 20 fl. ozs. would be well nigh universally given, for a pint of cod liver oil, castor oil, or any other medicine most frequently but 16 ozs. Surely these inconsistencies should cease.

JOHN THROSSELL.

PATENT MEDICINES.

Sir,—It is not at all likely that the Legislature or the Privy Council would carry out Messrs. Kay's "remedy" (page 653). May I suggest that a more practicable way of attaining the object aimed at, and which would also tend to the benefit and safety of the public, would be to enlarge the poison schedule by adding a third list of powerful and active medicines which, while not requiring a poison label, should only be sold with a caution label. Then it should be also enacted that with all patent medicines containing any article on either list, it should be distinctly stated on the attached label the proportion of such article or articles in the medicines, and also that such medicines could only be sold by duly registered chemists. In some such way the object aimed at may be probably attained, and such an amendment of the Poison Act may probably be carried through Parliament. Although such an arrangement would not by any means include all patent medicines, it would include such a proportion as practically to leave the trade in the hands of responsible chemists, to whom it rightfully belongs. I doubt also whether Messrs. Kay's 8 per cent. is not far too low, as to the present proportion of patent medicines containing articles in the present poison schedule. In any alteration of the poison schedule surely some modification should be introduced to obviate the necessity for labelling paregoric, paregoric lozenges, etc., poison, as must now be the case if the law be strictly carried out.

Barnstaple. W. SYMONS.

"*Occidens.*"—(1) *Hypnum populeum;* (2) *H. molluscum;* (3) *H. palustre;* (4 and 6) *H. rusciforme;* (5) *Didymodon rubellus.*

G. A. Webb.—The presence of some free hydrochloric acid would probably prevent the precipitation.

The Discrepancy in Examination Results.—*Anglicus* writes to endorse the opinions expressed in the letter of *E. H. S.* (p. 724) on this subject. He remarks that when a man is spoken of as being "long-headed," the meaning is that he is anything but stupid.

"*Aqua.*"—We must refer you to the prospectuses of the different makers.

"*Hydrargyrum*" is recommended to address his question to a medical contemporary.

C. Collins.—The subject of your letter is under consideration and will be dealt with at the earliest opportunity.

COMMUNICATIONS, LETTERS, etc., have been received from Professor Dymock, Mr. Banks, Mr. Bingley, Mr. Holden, Mr. Hessell, Mr. Mackay, Mr. Barrett, Practice, In a Groove, Beta, T. N. F.

* Our correspondent appears to reiterate, in other words, the remarks we made in reference to Mr. Duncannon's letter; but we fail to perceive any logical sequence in his argument that the standard of the Preliminary examination must be lowered because the lads available as apprentices are not equal to passing it as it is.—ED. PHARM. JOURN.

SULPHATE OF QUINIDINE.

BY DR. J. E. DE VRIJ.

In reading on page 721 of the Journal the transactions of the Paris Société de Pharmacie in the meeting on the 9th of January, my attention was struck by the conclusion of M. Petit "that the neutral sulphate of quinidine does not contain water of crystallization." This conclusion, combined with the wish of a Dutch chemist expressed in one of our journals to become acquainted with a cheap reagent to test the purity of the commercial sulphate of quinidine, induces me to communicate some particulars about this compound.

Professor A. C. Oudemans determined the molecular rotation of this salt dissolved in absolute alcohol.

A salt prepared by himself, $2\,(C_{20}H_{24}N_2O_2)\,SO_4H_2 + 2H_2O$, in which he found experimentally 4·5 per cent. of water yielded a molecular rotation of 255° 2′ ♂.

A salt beautifully crystallized in very long needles, presented to me by Messrs. Howard and Sons, in which he found 4·5 per cent. of water, yielded a molecular rotation of 255° 4′ ♂.

A salt presented to me by M. Tallandier, of Argenteuil, in which he found 4·6 per cent. of water, yielded a molecular rotation of 254° 9′.

From these experiments it follows that the crystallized sulphate is scientifically not anhydrous, but contains two molecules of water of crystallization = 4·603 per cent. From a commercial point of view, however, I found that M. Petit is right, for 7·003 grms. of commercial sulphate of quinidine, presented to me a few years ago by Messrs. Howard and Sons, lost only 0·025 grms. = 0·35 per cent. by a long exposure to the heat of a water-bath. It seems therefore that the pure crystallized sulphate loses its water of crystallization very easily.

The test for the purity of this salt is based upon the fact, which I found more than twenty years ago, that the hydriodate of quinidine requires more than twelve hundred parts of cold water to dissolve it.

One gram of sulphate of quinidine, prepared by myself in 1856 chemically pure from a specimen of quinidine kindly presented to me by Mr. J. Eliot Howard, was dissolved in 50 grms. of hot water, and to this solution added 0·5 grm. of potassium iodide. By this addition a heavy sandy crystalline powder of hydriodate of quinidine was precipitated, and on filtering off the liquid on the next day, the clear liquid was not altered by the addition of a few drops of liquor ammoniæ, but remained *perfectly clear.*

Having ascertained by this experiment the behaviour of the chemically pure sulphate of quinidine under the circumstances mentioned, I applied this test to the good commercial sulphate, presented to me a few years ago by Messrs. Howard. I found that the liquid filtered from the precipitated hydriodate of quinidine became *slightly* turbid by the addition of liquor ammoniæ, but without separating an appreciable precipitate.

Therefore, the practical test for the purity of the commercial article is to dissolve one part of the salt in fifty parts of hot water, and to add to this solution a half part of iodide of potassium. If the precipitate is not sandy, but resinous, no further trouble need to be taken, for this resinous aspect proves that the salt contains either cinchonine or cinchonidine, or perhaps both of them. If, however, the precipitate constitutes a heavy sandy crystalline powder, the filtered liquid is after some hours tested by liquor ammoniæ. If this addition makes the liquor only slightly turbid *without formation of an appreciable precipitate*, the conclusion is that the salt is really good sulphate of quinidine, and contains only traces of other cinchona alkaloids, which generally is a slight trace of cinchonine.

The Hague.

NOTES ON INDIAN DRUGS.

BY W. DYMOCK.

(*Continued from page* 566.)

HELICTERES ISORA, *Linn.*, STERCULIACEÆ. *The fruit. Vernacular*, MAROREE, MARORPHALI (Hind.); MURADSINGH KAWUN (Bomb.); VALUMBIRIKAI (Tam.).

History, Uses, etc.—This is a tall shrub, or small tree, much resembling the common hazel; the flowers, which are bright red and showy, appear in the rains. In Sanskrit it is called "Avartani." The peculiar twisted form of the carpels has probably led to its use as a medicine according to the ancient doctrine of signatures. Ainslie notices its use by the Hindus as a remedy for offensive sores inside the ears. At the present time it enters into most prescriptions for the cure of griping in the bowels and flatulence, especially in the case of children. Its chief virtue seems to be its harmlessness.

Description.—The fruit consists of five slender angular carpels twisted like a corkscrew, and together forming a cone about 1½–2 inches long. The carpels are pubescent, and of a greenish brown colour; they contain a single row of dark brown angular seeds. The internal surface is of a light greenish hue and highly polished; taste mucilaginous. Medicinally we may consider this drug to be simply demulcent.

Commerce.—It is kept in all druggists' shops, and as a domestic remedy is perhaps one of the best known articles in the Hindu materia medica. Value Rs. 3½ per Surat maund of 37½ lbs.

PTEROSPERMUM SUBERIFOLIUM, *Willd.*

The white fragrant flowers of this tree, which appear in May, rubbed into a paste with kángika (rice vinegar), is an ancient and well known Hindu remedy for hemicrania. The Sanskrit name of the plant is "Muchukunda," which is also the current name in Bombay for *P. suberifolium* and *P. acerifolium.*

BALSAMODENDRON OPOBALSAMUM, *Kunth*, TEREBINTHACEÆ. *The balsam and wood. Vernacular.—The balsam*, BALASAN (Arab., Pers., Bomb.). *The wood*, AOOD-I-BALASAN (Pers. and Bomb.).

History, Uses, etc.—Arabic and Persian writers describe the balm of Gilead tree as having hoary leaves like rue, and say that it is affected by heat and cold, drought and moisture, like a human being. They affirm that it sprang from the blood of the slain in Mahomet's conflict with the tribe of Harb, and that the Prophet used the balsam for the resuscitation of the dead. Antakia says that the Christians have a tradition to the effect that when the holy Virgin Mary and our Lord fled to Matriya, in Egypt, our Lord washed his clothes at a well, and from the waste water which ran upon the ground, the balsam tree sprang up; that on this account the tree is held in great veneration by the Christians who value the balsam at its weight in gold. The wood is called Aood-i-balasan; it is heavy and red, with yellowish bark. Genuine balasan when thrown into water sinks; cotton dipped in it can be washed quite clean in water. When rubbed upon a stick and inflamed, it should burn without injuring the wood, like naphtha (*Vide* 'Makhzan-ul-adwiya,' article Balasan). Abd-ul-Latif, who lived from 1161 to 1231, has described the extraction of the balsam at the garden of Matriya, near Cairo. He says that incisions are made with a sharp stone through the bark down to the wood, the juice is scraped from the tree by the fingers, and preserved in bottles which are buried in the earth for a time, and afterwards exposed to the sun until all the balsam has separated from the impurities; it is then subjected to some secret process, after which it is stored in the king's treasury. The annual produce of the garden is about 20 ratls (*Vide* Husn-ul-muhasarin fi Akhbar Mier wa ul Kahirah). The balsam is also extracted by boiling the leaves and wood in water.

Description.—Balsam of Mecca when freshly imported into Bombay is a greenish turbid fluid of syrupy consistence, having a very grateful odour, something like oil of rosemary; when dropped into a vessel containing water it rises and forms a thin film upon the surface of the liquid, which after about a quarter of an hour can be raised entire by touching it with a pencil. When rubbed upon the palm of the hand for a few minutes, it loses its essential oil and becomes very sticky. Dissolved in 6 parts of spirit 60 O.P., it forms a turbid greenish solution with many opaque flakes floating in it; these are soon deposited and adhere to the bottom of the bottle.

The spirituous solution dropped on paper and placed in the sun rapidly evaporates, leaving a slightly sticky varnish upon the surface of the paper. The balsam itself dropped upon common scribbling paper spreads a little, and soon becomes very thick; the paper beneath the drop becomes translucent only. After twelve hours it becomes so hard, that when touched it no longer adheres to the finger.

Treated with 6 parts strong sulphuric acid, B.P., the balsam forms a rich red-brown translucent solution, of the colour and consistence of Stockholm tar, which upon being poured into water throws down a dull brown resinous deposit. Balsam of Mecca which has been kept some time in the shops becomes yellowish and more viscid. The essential oil would appear to be very volatile, as after a short exposure the balsam does not render paper translucent, and has a simply terebinthinate odour. The taste is aromatic, bitter, and somewhat acrid. It would, then, appear that the Bombay balsam is very nearly of the same character as that described by Guibourt and supplied to him by M. Delessert, only that being fresher it differs in colour and contains more essential oil (confer *Hist. Nat.*, 6ème *ed. t. iii. p.* 507).

Chemical Composition.—Trommsdorff found in a sample of this balsam 30 per cent. of volatile oil, 64 per cent. of hard resin, 4 per cent. of soft resin, and 0·4 per cent. of bitter principles. The volatile oil was mobile, colourless, fragrant, and had a rough taste; it dissolved in alcohol and ether, and with a deep red colour in sulphuric acid, whence it was precipitated by water as a resin. It was also resinized by nitric acid. The hard resin was honey yellow, transparent, brittle, of specific gravity 1·333, softened at 44° C., and melted completely at 90° C. It dissolved with difficulty in alcohol and ether at ordinary temperatures, easily with aid of heat; it was likewise soluble in oils, both fixed and volatile. It was altered by hot nitric and sulphuric acids, and appeared to combine with alkalies, forming compounds insoluble in free alkali. The soft resin was brown and very glutinous, inodorous, and tasteless; melted when dry at 112° C. It was insoluble in alcohol and ether, but soluble in oils, both fixed and volatile. It was not attacked by alkalies or by strong sulphuric acid; with nitric acid it swelled up and became friable.

MELIA AZADIRACHTA, *Linn.*, MELIACEÆ. *The root bark and fruit. Vernacular.*—BAKAYAN (Hind.); GOREE NEEM (Bomb.); MALAI-VÉMBU, MALAI-VÉPPAM (Tam.).

History, Uses, etc.—The Persian lilac was probably introduced into the southern parts of India by the Mahometans. It is a native of the sub-Himalayan tracts, and has a Sanskrit name, "Mahanimba." The Hindus do not appear to have paid much attention to it, but it has long been used by the Arabs and Persians, who consider it to be hot and dry, and to have deobstruent, resolvent, and alexipharmic properties. The flowers and leaves are applied as a poultice to relieve nervous headaches. The juice of the leaves administered internally is said to be anthelmintic, antilithic, diuretic, and emmenagogue, and is thought to resolve cold swellings, and expel the humours which give rise to them. The bark and leaves are used internally and externally in leprosy and scrofula. A poultice of the flowers is said to kill lice and cure eruptions of the scalp. The fruit has poisonous properties, but nevertheless is prescribed in leprosy and scrofula. The root bark of *M. azadarachta* is placed in the secondary list of the United States Pharmacopœia as an anthelmintic. It has a bitter nauseous taste, and yields its virtues to boiling water. It is administered in the form of decoction (four ounces of the fresh bark to two pints of water, boiled to one pint), of which the dose for a child is a tablespoonful every third hour until it sensibly affects the bowels or stomach, or a dose may be given morning and evening for several days, and then be followed by a cathartic. In large doses it is said to produce narcotic effects, but these if produced passed off without any perceptible injury to the system.

Description.—The fresh root bark is thick and rather spongy, the external surface is very scabrous and warty, of a dark brown colour, beneath the epidermis it is of a deep pink, internally white; taste acrid, nauseous, astringent and slightly bitter.

Microscopic structure.—No starch is to be seen either in the wood or bark, nor does iodine indicate its presence. The cells containing red colouring matter are mostly grouped in patches immediately beneath the epidermis.

POINCIANA PULCHERRIMA, *Linn.*, LEGUMINOSÆ. *The bark, leaves, flowers, etc. Vernacular.* — GUL-I-TURAH, KRISHNACHOORA (Hind., Beng.); GUL-MOHR (Bomb.); MAIL-KANNAI, KOMRI (Tam.).

History, Uses, etc.—This elegant shrub, named after M. de Poinci, once Governor of the Antilles, has become quite naturalized in India, and is one of the commonest garden shrubs in Bombay. According to

Ainslie it was introduced into the Botanical Gardens in Calcutta in 1792. He gives the following description of it. "The species in question is a most beautiful tree, which commonly rises to about 12-14 feet high, with leaves doubly pinnate, and leaflets oblong-oval, emarginate; they and the calices smooth, corymbs simple, petals fringed, stamens very long. It would appear to be a native of both the Indies. It is the Hoa-phung of the Cochin-Chinese; on the Malabar coast it is called Tsietti-mandaru; in Ceylon its common name is Monora-mal, and from its extreme beauty, Burmann gave it the appellation of 'Crista pavonis flore elegantissimo variegato.' The French in the West Indies call it 'Fleur de paradis.' The flowers come out in loose spikes at the extremity of the branches; the petals, which have an agreeable odour, are beautifully variegated with a deep red or orange colour, yellow, and some spots of green." All parts of the plant are said to be emmenagogue and purgative, but there appears to be no record of any exact observations upon this point. The plant is not used medicinally in Bombay.

Description.—The bark is ash-coloured, smooth, thickly studded with small elliptic corky warts; the whole of the suber readily separates like birch bark, disclosing a streaky mottled green and pink surface, which is marked by numerous small scars corresponding to the warts above mentioned. The substance and internal surface of the bark is of a pinkish tinge. Taste rather nauseous, very astringent. Microscopic structure not in any way peculiar. Parenchyma loaded with starch; many cells contain red colouring matters.

CASSIA SOPHORA, *Linn.*, LEGUMINOSÆ. *The leaves, seeds, and roots. Vernacular.*— SARI-KASONDI, KALI KASONDI (Hind. and Bomb.); PONNA-VIRAI, PÉRA-VIRAI (Tam.); KAL-KASONDA (Beng.).

History, Uses, etc.—The Sanskrit name of this plant is Kasamarda, and signifies "destroyer of cough." It is supposed by the Hindus to have expectorant properties. It is also noticed in Mahometan works as a remedy for snake bites. The root is directed to be given with black pepper. A plaster or poultice of the root with sandal wood is said to cure ringworm.

Description.—Annual, erect, branched, glabrous; leaflets six to twelve pair, lanceolate, or oblong-lanceolate, acute, with a single gland near the base of the petiole; racemes terminal or axillary, few-flowered; upper petal retuse; legumes long, linear, turgid, glabrous, many seeded; suture keeled; seeds horizontal with cellular partitions; flowers middle-sized, yellow. The plant has a heavy disagreeable smell, and a purplish tinge; the root is fibrous and woody. It springs up on waste ground during the rains, and flowers in November.

CASSIA OCCIDENTALIS, *Linn.*, LEGUMINOSÆ. *The leaves, seeds, and roots. Vernacular.*—KASONDI, BARI-KASONDI (Hind.); KIKAL (Bomb.); NATTAN TAKARAI (Tam.).

History, Uses, etc.—This plant is treated as a variety of the last mentioned by the natives of India. It has the same Sanskrit name, and is considered to have much the same medicinal properties. Mahometan writers also treat the two plants as varieties of the same species; they describe Kasondi as alexipharmic, useful in the expulsion of corrupt humours and to relieve cough, especially whooping cough.

Description.—Annual; erect; branches glabrous; leaflets three to five pairs without glands between them, ovate-lanceolate, very acute, glabrous on both sides; petiole with a large sessile gland near its tumid base; flowers longish-pedicelled, yellow, upper ones forming a terminal raceme, lower ones three to five together on a very short axillary peduncle; legumes long, surrounded with a tumid border. The plant appears in the rains upon waste ground and rubbish; it has a sickly offensive smell.

BOA-TAM-PAIJANG (STERCULIA SCAPHIGERA, *Wall.*).

BY JOHN R. JACKSON, A.L.S.,

Curator of Museums, Royal Gardens, Kew.

At page 6, Vol. III., 2nd series of the *Pharmaceutical Journal* for 1861-62. in the well-known "Notes on Chinese Materia Medica," by the late Daniel Hanbury, is a notice of the "Ta-hai-tsze" or "Boa-tam-paijang," the seeds of which were introduced into France many years since as a remedy for diarrhœa and dysentery. Though at the time of their introduction in, 1854, they were quoted in the wholesale price list of a large Parisian druggist at about £3 13*s.* per pound, they were ascertained by careful tests to give no satisfactory results. In the notes above referred to, they are described as the fruits of *Erioglossum* (?) or *Nephelium* (?) but from specimens contained in the Kew museum, which were apparently obtained from the first sample brought to Europe, and which have been named *Erioglossum edule*, Bl., they seem upon comparison with authentic herbarium specimens to belong to *Sterculia scaphigera*, Wall. This plant differs in its fruits from most species of *Sterculia*. They are of a thin papery texture, and follicular or boat shaped in form, with veins or nerves running parallel the whole length. As the fruit ripens, this follicle bursts, leaving the solitary erect seed which is attached to the base exposed to view. This seed is brown and wrinkled, and is accurately described and figured in Mr. Hanbury's notes. It seems that these seeds have been mistaken for entire fruits, the large papery follicle which easily becomes detached not having been present in the samples described. Whether these seeds, which are said to be produced in great abundance, can ever be utilized for any other purpose beside that for which they were first introduced, is, I think, a point worth considering. Their extremely mucilaginous or gelatinous nature would seem to indicate some useful application.

THE THEORY OF FLAME.*

BY ARTHUR G. HADDOCK.

All gases, and all solids and fluids which are converted into gases by the heat necessary for their combustion, can burn only as gases, and it is the light emitted by their combustion in this manner which we call flame, and is, in fact, gaseous matter in a state of incandescence.

If the oxygen, or air, necessary for the combustion of a gas, is uniformly mixed with it beforehand, the burning takes place immediately, with explosive violence, and the mixture appears equally luminous throughout.

The same effect is seen when the combustible is in the

* Read at a Meeting of the Liverpool Chemists' Association, Feb. 14, 1878.

solid state, as in charcoal, and is mixed with some substance containing oxygen which it readily gives up, as potassium chlorate. Immediately the mixture is brought in contact with a hot substance, the ignition commenced at the point of contact spreads itself throughout the whole, a great amount of gas is formed suddenly, and a noise is produced, owing to the violent concussion of the air, caused by the sudden expansion of the gases produced by the combustion.

But if the combustion is made to take place in a more gradual manner, by allowing the gas or vapour to issue from a jet or wick into the air, where the burning can only take place at the point of contact of the combustible gas with the air, we get the production of flame.

Flame-producing substances may be divided into two classes (1), those which give a non-luminous flame, and (2) those which give a luminous flame.

Of the first class are hydrogen, alcohol, sulphur, carbonic oxide; and the flame of any of these may be rendered luminous by the introduction of a solid body, either in a fine state of division or otherwise.

A bright flame is produced by (1) compounds containing carbon, in which a portion of the carbon is separated as soot by the heat of the combustion of the part which is actually ignited, the soot being first made incandescent, and subsequently burning. Examples of this class are olefiant gas, tallow, wax, oil of turpentine, oil of petroleum, colza oil, etc. (2), Substances which when burnt in oxygen, produce a compound, which is solid at the temperature at which the substance burns, as phosphorus, potassium, zinc, etc.

We derive from this that the luminosity of a flame is due to solid particles (or dense vapours) suspended in it, and these particles being raised to a state of incandescence by the heat developed during the combustion. A proof of this general rule is seen in phosphorus, which when burnt in oxygen forms phosphoric pentoxide—a solid substance—and a light of dazzling brightness is emitted. If, however, the phosphorus is burnt in chlorine, it burns with a very slightly luminous flame, owing to the chloride of phosphorus which is formed remaining as a gas.

An alcohol flame may be rendered luminous by burning it in chlorine. The chlorine unites with the hydrogen of the alcohol, and having no affinity for carbon, the latter is separated in the form of soot, which becomes incandescent. Alcohol may also be made luminous by the introduction into the flame of a paper soaked in calcic chloride solution, which when burnt leaves an ash in a fine state of division, and great brilliance is thus given to the flame.

Then again, the hydrogen flame may be rendered luminous by the insertion of a spiral of platinum wire, or a piece of asbestos; and so on with the other bodies.

On the other hand, the luminosity of the flame of carbonaceous substances may be destroyed by mixing the gases or vapours with a sufficient quantity of air or oxygen before they are burnt, and thus preventing the separation of carbon, since it is obvious that we cannot have carbon existing free in the presence of oxygen. This is seen in the Bunsen lamp, which I shall speak of further on, and in the blowpipe flame.

In order to render a gaseous body luminous it is necessary that it should contain some of the heavy hydrocarbons (such as benzol, naphthaline), which, either by separation of carbon, or by themselves becoming white-hot, shall emit light, or that some solid body should be introduced into the flame. Leaving out such substances as hydrogen, with spiral of platinum, magnesium, etc., as impracticable, we find ourselves reduced to the hydrocarbon compounds, for furnishing us with our artificial light. Such compounds we have in coal-gas (or in gas obtained by the destructive distillation of wood, peat, shale, etc.); in tallow, wax, paraffin, palm oil, etc., which we burn in candles; in petroleum oil, colza oil, kerosene, fish oil, solar oil, refined oil of turpentine, etc., which we burn in lamps; or in the water gas, which is sometimes used, and consists of a mixture of equal volumes of hydrogen and carbonic oxide, the carburation of which has been effected by the vapours of fluid hydrocarbons.

It has been a mooted point as to whether the luminosity of burning hydrocarbons is due to the separation of carbon, or to the presence or formation of dense hydrocarbons having a high boiling point, which themselves become incandescent. These vapours are present in illuminating gas. According to Dr. Frankland, who investigated the matter in 1867, it is not free carbon, but rather the dense vapours of these heavy hydrocarbons, which when ignited are the cause of the luminosity of the flame, in the same way that the vapour of arsenic makes the flame of hydrogen luminous.

There is a great deal to be said in favour of this theory. As a proof that it is solid carbon, momentarily eliminated, it is pointed out that if a cold porcelain plate is held in the flame we get a deposit of soot. But then this soot is not pure carbon, but seems rather a conglomerate of the different vapours of dense hydrocarbons, condensed on the cold surface, and we know that to get pure carbon from lamp-black, it requires long ignition at a high temperature in a covered crucible, and we have to pass chlorine gas over it at a white heat before we can get rid of all the hydrogen which it contains. Then again the flame could not be so transparent if its luminosity was caused by opaque particles of solid carbon, and it would make a difference in photometrical operations according as the flame was placed with its narrow or broad edge towards the photometer, if the light were due to opaque particles, whereas we find that such is not the case.

So that, on the whole, I think that Dr. Frankland has pretty conclusively demonstrated that the luminosity is due to the dense hydrocarbons.

It is possible that carbon is separated in a slight degree by the decomposition of the dense hydrocarbons.

The more slowly hydrocarbons are burned, the greater is the quantity of dense vapours separated, but the luminosity of the flame is less because the particles are less strongly heated. If the gases are burnt more quickly there are fewer dense particles separated, but the temperature to which they are raised is much higher, and a brighter light is emitted from them.

Pressure has an influence on the luminosity of flame. On the summit of Mont Blanc candles and gas burn with a very feeble flame. Experiments which have been made in artificially rarefied atmospheres show that the luminosity of the flame increases or decreases in direct proportion to the pressure upon it, down to fourteen inches pressure of mercury. Below that point it diminishes rather more slowly. Between the limits of thirty inches and fourteen inches the luminosity has been found to decrease according to the following law:—Of 100 units of light emitted from a gas flame, burning at a pressure of thirty inches of mercury, in air, 5·1 units are extinguished by each reduction in pressure of one inch of mercury. Under increased pressure the luminosity is found to increase in direct proportion up to two atmospheres' pressure, after which the increase of light is more rapid and attended with smoke.

These variations in the luminosity do not seem to be caused by the alteration of temperature. Davy and Frankland have found that rarefaction and compression do not influence the temperature of the flame, as though in rarefied air the temperature within the flame is lower, the escape of heat from the exterior is less, and the two balance each other. Neither is the variation caused by imperfect combustion, as the gases from a flame burning at a pressure of eight inches are found to have the same composition as those from a flame burning at the ordinary pressure. The cause seems to be that with higher pressures, there is a greater separation of dense hydrocarbons, since a candle evolves more and more of them at increased pressures, and the flame of alcohol at a pressure of four atmospheres becomes luminous. On the other hand, rarefaction, by increasing the mobility of the gaseous particles, brings a greater supply of oxygen into that part of the flame where the dense vapours which produce the luminosity are being formed, and by their being oxidized before they become white hot, the luminosity is diminished.

The rate of combustion of a candle or gas is found not to be sensibly affected by alteration of the pressure upon it, and a candle will burn on Mont Blanc at pretty much the same rate that it would at the level of the sea.

Having now considered the reason of the luminosity of flame, and the various influences which affect the luminosity, we will briefly examine the flame itself, taking as an example, that of a candle or gas.

Firstly, then, as to its shape. As soon as the wax is vaporized by the heat applied, the gaseous particles have a tendency to fly outwards, which they do, producing the broad base, and the surrounding air becoming heated, and consequently specifically lighter, ascends, making a current, and pressing on the flame on all sides, which prevents its further divergence, and it gradually tapers off to a point, as the combustible materials get expended.

The flame of a candle may be said to consist of three distinct parts (1) an inner dark zone, surrounding the wick, in which the unburnt gaseous substances are heated. (2) a central luminous zone, which is white-hot, and where the gases are not completely burnt, and (3) an outer non-luminous zone, where the combustion is perfect.

That no combustion is going on in the inner zone may be shown by placing a piece of phosphorus on the wick of a spirit-lamp, the phosphorus not taking fire when the lamp is lighted, unless the flame is blown over on one side. Or we may conduct the vapours through a bent glass tube by inserting one end of it in this zone, when on applying a light they will burn at the other end of the tube.

In the second (central) zone, the gases are become sufficiently heated to burn, and come in contact with the oxygen of the air, but not enough for their complete combustion. As the gases for the most part are composed of carbon and hydrogen, the oxygen having a greater affinity for the hydrogen, takes away the greater part of it from the carbon, leaving gases containing a much greater proportion of carbon to hydrogen (such as naphthalene, etc.) than the original gases, and having, consequently, a greater density. By the combustion of the hydrogen, these dense vapours become white-hot, and emit light. They pass on to the outer zone, where they meet with a fresh supply of oxygen, and are completely burnt, and converted into carbonic anhydride and water, the products of the combustion.

According to experiments made by Deville, the denser the vapours present in a flame, the greater will be the luminosity of it. From this we should expect that those hydrocarbons which are the richest in carbon would be the most suitable for lighting purposes. This is so ; but if the substance contains more carbon than accords with the formula C_2H_4, or six parts by weight of carbon to one part by weight of hydrogen, it will burn in air, free from draught, with a smoky flame. Thus, oil of turpentine, which contains $7\frac{1}{2}$ parts of carbon to 1 of hydrogen, burns with a sooty flame in air, owing to the separation of a greater amount of dense hydrocarbon vapours than can be oxidized with the supply of air. In order to remedy this a lamp glass is used, which by creating an upward current, brings more oxygen in contact with the flame.

Oil of petroleum, which is a mixture of the higher compound homologous with marsh gas, and contains five parts by weight of carbon to one part of hydrogen, will produce by its ignition more light than an equal weight of coal gas, in which, reckoning the free hydrogen, the proportion of carbon to hydrogen is about 2·3. And as the carbon in these substances is ultimately converted into carbon anhydride, the amount of that gas produced by the burning of a given weight of oil of petroleum will be considerably greater than that produced by the combustion of the same weight of coal gas. But this, by the way.

Having now dealt with the nature of luminous flame, we will proceed to examine that non-luminous coal-gas flame which we so often use in the laboratory, and which we obtain in the Bunsen lamp. And for most of what I shall say on this subject, I am indebted to the valuable paper Professor Thorpe has written upon it.

The Bunsen lamp consists of a brass tube, screwed on an iron foot. At the bottom of the tube is a jet through which the gas issues from a pipe with which it is connected and in the tube are two or more holes, on a level with the jet, through which air passes and is carried up with the gas, and is uniformly mixed with it in the length of the tube, so that when the mixture is lighted at the top of the tube it burns with a non-luminous flame. And it may be seen that it is really the air mixed with the gas, which has rendered it non-luminous, by closing the holes at the bottom of the tube so that no air can enter, when it immediately becomes luminous. It is clear also, that to get perfect non-luminosity there must be a relation between the size of the jet by which the gas enters, and the size of the holes by which the air enters the tube. If the jet is too large the flame is tinged with white and deposits soot on a cold surface held in it; if the holes are too large the flame sinks to the bottom of the tube. There must also be a certain relation between the height and width of the tube.

Let us see how it is that by having two holes at the bottom of the tube, air will enter and mix with the gas in sufficient quantity to make it non-luminous. If a box filled with compressed air is perforated on one side and held with the perforation over a small disc of cardboard, it is found that the disc is forcibly sucked towards the hole against the escaping air and in opposition to gravity, and is held there with considerable force. Instead of this we should, *à priori*, expect the disc to be blown away. Faraday used to show the same thing in a beautifully simple manner, by placing his hand flat over a card at a short distance from it, and then blowing between the knuckles of his first and second fingers. The card was lifted up to his hand and remained suspended there as long as he continued blowing. This seemingly paradoxical effect is due to what Professor Thorpe calls an area of low pressure in the vicinity of the orifice through which the issuing gas escapes. This low pressure seems to be induced by the current of air formed by the blast taking away in its course the circumjacent air, and thus forming a partial vacuum.

Spray-distributors are constructed on this principle. They consist of two tubes at right angles to each other, the end of one just overlapping the end of the other. If now one of these tubes is placed in the liquid which is to be distributed, and we blow down the other tube, the fluid rises and is dispersed with great force in the form of spray. The blast of air passing over the top of the tube inserted in the fluid, takes along with it the air in that tube, and a vacuum is produced. The fluid immediately rushes up the tube to supply the place of the expelled air, and in its turn is carried away with the blast. So it is with the lamp. The gas escaping under pressure from the burner inside takes along with it the surrounding air. More air rushes in through the holes, and so a constant stream is supplied. That there is an upward current of air entering may be seen by stopping up one of the holes with a cork and inserting a glass tube in the other. If now the lamp is lighted and the flame of a candle is held at the end of the glass tube, it will be seen that the flame is bent over and drawn into the tube.

When the gas leaves the jet it rapidly spreads out, and for this reason the air mixes uniformly with it in its passage up the tube.

For the mixture of gas and air to burn at the top of the tube it is necessary that the speed at which the gas flows from the burner should be equal to or greater than the rate of combustion. If the rapidity of inflammation is greater than that of the gas flowing from the tube the flame retreats down the tube and the gas burns at the bottom. If we lower the gas, for instance, and thus lessen the rate of efflux, when we get to the point when it is less than the rapidity of inflammation the flame will retreat unless we put a piece of wire gauze over the tube, which will have a cooling effect on the flame, and will also help to give a uniform speed to the gas, as one cause of the flame retreating is the friction of the sides of the tube retarding the progress of those particles of gas nearest to them. The narrowing of the top of the tube as proposed by Professor Morton prevents the flame from retreating, as it tends to make the motion of the particles more equal by increasing their velocity.

The gas as it issues from the tube of an ordinary lamp is mixed with about two or two and a-half volumes of air. M. Mallard has found that if coal gas is mixed with less than three and a-half or more than eight times its volume of air, it is not combustible. In the flame, therefore, we have a very large area of unburnt gas, as it is only able to burn at the edges, where it can obtain from the air the additional quantity of oxygen necessary for its combustion. The existence of this cone of unburnt gases may be shown by fixing a fusee match so that the head appears above the top of the tube. When the gas is lighted it will be seen that the match does not burn.

We will now see how it is that the admixture of air with the gas makes the flame non-luminous. It was formerly supposed to be entirely due to the oxidation of the carbon into carbonic anhydride simultaneously with the oxidation of the hydrogen, and that therefore it was the oxygen in the air mixed with it that destroyed the luminosity. This idea has, however, been exploded, and it is now shown to be due rather to the nitrogen in the air.

We will stop up one of the holes in a Bunsen lamp and fasten in the other a tube connected with an apparatus for generating carbonic anhydride. Of course, as long as the coal gas comes up the tube alone the flame is luminous. If now, however, we pass carbonic anhydride in through the tube the luminosity rapidly diminishes and is eventually destroyed. The same result would have occurred if nitrogen or steam had been used. In fact any indifferent gas will destroy the luminosity.

The natural inference from this is that the non-luminosity is due to dilution of the gas. This is one, but not the only reason.

Of course the admixture of such a large volume of air or other gas will lower the temperature, as we have a greater quantity to be raised to the heat required, and this reduction of temperature will lower the illuminating power of the flame. If we fit a platinum tube to the brass tube of the lamp and heat this with a Herepath blowpipe the flame becomes luminous, just as if the air was shut off, and as the tube cools the luminosity decreases and we again get the normal Bunsen flame. The heat thus added to the gas is therefore sufficient to make the flame luminous.

The result of this experiment seems rather to clash with Dr. Frankland's theory, since by heating the gases they have become expanded and rendered less dense, but I think we may reconcile the theory with the facts by the supposition that although the gases before combustion are rarefied, more than a proportion of the hydrogen first unites with oxygen, and denser hydrocarbons are formed.

We may say, then, that the non-luminosity of the Bunsen flame is due to several causes, and we cannot say that it is due to any of these separately. They are, the dilution of the gas, the reduction of temperature by the heat abstracted by the products of combustion and the nitrogen, and the rapid oxidation into feebly luminous bodies.

The last point to be noticed is the flame when the gas burns at the bottom of the tube. When this happens, as it often does when the flame is turned low and the room is at all draughty, we have a very disagreeable smell and deposition of soot on a cold surface. This shows imperfect combustion, which we should expect, as the only oxygen it can obtain is what comes in through the holes at the bottom of the tube, and this quantity is insufficient for the complete combustion. Blochmann has analysed the gases in the tube before and after combustion in this manner, with results as below:—

	Gaseous Mixture. Before the Combustion.	After the Combustion.
H	19·91	9·14
CH_4	14·82	13·49
CO	2·26	4·64
C_2H_2	...	·75
C_2H_4	1·57	·63
C_4H_8	1·20	·26
N	46·54	46·54
O	12·25	...
CO_2	·45	3·02
OH_2	1·00	17·33
	100·00	95·80
Contraction		4·20

Nearly half the hydrogen has gone, there is a marked decrease in the ethene compounds and a little decrease in the marsh gas. There is a large increase in the amount of water vapour, due to the oxidation of the hydrogen. It will also be noticed that the carbonic oxide is twice as much after combustion, and that there is formation of acetylene. Both these gases are poisonous. The oxygen has entirely disappeared, and this may be demonstrated by replacing the brass tube of the lamp by a glass tube and lighting the gas at the bottom. If now a sulphur match be held in the tube it will be seen that the composition melts and volatilizes, but will not take fire until withdrawn from the tube into the air, when it immediately blazes up. The matches such as are now generally used will not do for this experiment, as they contain the oxygen necessary for their combustion in themselves in the form of chlorate of potassium.

Without stopping to notice the construction of the Davy lamp and other points of great interest in connection with it, I will conclude by recommending the subject to your consideration, as I am sure great pleasure and benefit may be derived from the study of it, both by the practical chemist and by the lover of science in the abstract.

THE USEFUL SPECIES OF VIBURNUM.*

BY JOHN M. MAISCH.

The genus *Viburnum*, which belongs to the natural order Caprifoliaceæ, tribe Sambuceæ, attracted my attention more closely when, in July last, a correspondent in Georgia sent me some branches of a woody plant, stating that the specimens came from near Orange Springs, Florida, where it was regarded as possessing valuable medicinal properties as a substitute for quinia; the shrub was said to bear a small black berry, and to be called there *black haw*, but it was mentioned that it differed from what is known by the same name in other parts of the country. Although the specimen was not accompanied by flowers or fruit, its characters were such as to lead to the supposition that it might belong to the genus *Viburnum*, and this was verified by comparing it with the plants in the College herbarium, with one of which it entirely agrees.

Viburnum obovatum, Walt.—This species is mentioned in Gray's 'Manual' and in Chapman's 'Flora of the Southern United States,' the latter of which describes it as a shrub or small tree, while the former states it to be

* From the *American Journal of Pharmacy*, Feb., 1878

a shrub 2 to 8 feet high. It occurs on river banks from Virginia to Florida and westward. The branches are opposite and covered with a thin brown or reddish-grey bark, which adheres firmly to the white wood; in the youngest branches the bark is more green, but soon becomes covered with minute brownish, corky warts, which, on becoming confluent, give the older bark a somewhat irregular striate appearance. A distinct ridge runs from the base of each petiole downward to the next internode, and may be observed, also, on somewhat older branches, but gradually becomes indistinct through the development of the surrounding corky tissue. The leaves are small, about ½ to 1 inch long, opposite, thick, varying in shape from broadly obovate to spatulate, obtuse at the apex, wedge-shaped at the base towards the short petiole, and on the somewhat revolute margin either entire or slightly crenate or denticulate, chiefly towards the apex. Both surfaces are smooth, the upper one being dark green and glossy, the lower one more greyish-green and marked with numerous minute brownish dots. The inflorescence consists of small sessile three-rayed cymes, with white perfect flowers, which produce small ovoid-oblong black and one-seeded drupes. The wood is tasteless, the bark has quite a distinct bitter taste; but the bitterness of the leaves is by far more persistent. As far as may be judged from the taste, the leaves would appear to mainly possess whatever medicinal virtue may reside in the plant; how effectual they maybe as an antiperiodic I am unable to say.

Viburnum prunifolium, Lin.—Dr. Phares, of Newtonia, Mississippi, in 1867, called attention to the properties of the bark of this species, ascribing to it nervine, antispasmodic, tonic, astringent and diuretic properties, and recommending it as particularly useful in preventing abortion and miscarriage. The species is a tall shrub or small tree, from 10 to 20 feet high, growing in thickets, and is readily recognized by its oval or obovate, sharply serrulate leaves, which are opposite, glossy above, about two inches long and raised upon short, slightly margined petioles. It occurs in the United States from Connecticut south to Florida and west to Mississippi, and is generally known as *black haw*, the fruit being a small edible blue-black drupe, containing a flat and smooth putamen. The leaves, like those of the allied *V. nudum*, Lin., and its variety cassinoides, have occasionally been used as a substitute for tea.

Viburnum opulus, Lin.—This species is quite extensively distributed. It is indigenous to Canada and found in the northern United States and southward along the Alleghanies to Maryland; likewise throughout a great portion of Europe and of the northern section of Asia. In favourable localities it attains a height of 12 to 15 feet, but is more generally a lower shrub, with a grey or greyish-brown bark, broad, three-lobed, toothed or crenate leaves, and globular, acidulous bright red drupes, having a flat, smooth putamen. From the resemblance of the fruit to the cranberry, this species is known on this continent as *high cranberry* or *cranberry tree*. The shrub preferring moist locations, and the inflorescence resembling that of the elder, its popular German name is *Wasserholder* or *water elder* (*Sambucus aquaticus*), under which name it was formerly officinal. A variety produced by cultivation, has all the flowers sterile and the cymes more or less globular and showy; it is known by the names of *snow-ball* and *Guelder-rose*. The indigenous species was described by Pursh as *V. oxycoccus* and *V. edule*.

The bark and flowers of the water elder were formerly employed for their supposed alterative and antispasmodic properties, the common name *cramp bark* indicating the popular estimation in which it was and is, perhaps, still held in some localities. The fruit has the general properties of acidulous fruits, and where it is frequent is sometimes used in place of the cranberry.

Other North American Species of Viburnum.—Chapman enumerates nine species as being indigenous to the Southern United States east of the Mississippi; of this number only one, *V. scabrellum*, Tor. and Gr., is peculiar to that section, while the remaining eight are likewise found in the Northern States, some extending into Canada; three additional species are found in the northern section, making twelve indigenous to the United States. Aside from *V. prunifolium*, referred to before, the following are met with from the New England States southward to Florida, the last two (perhaps all three) being likewise indigenous to Canada; they are, *V. nudum*, Lin., or *white-rod; V. dentatum*, Lin., know as *arrow-wood*, and *V. acerifolium*, Lin., or *dockmackie*. Their leaves have a bitter taste, while the bark is bitter and astringent. I am not aware that they are medicinally employed in any part of North America.

Exotic Species.—De Candolle's 'Prodromus' enumerates altogether 47 species, besides four doubtful ones from Japan, which are insufficiently known. Deducting those which are at present regarded as mere varieties of other species, the number is reduced to about 40 species, 28 of which are exotic and distributed over Europe, the Canary Islands, Africa, Asia, the East Indian islands, the West Indies and South America. Only a few of these appear to be put to some use.

Viburnum Dahuricum, Pall., produces a sweet fruit, which is eaten in its native country, the eastern section of Siberia.

Viburnum Tinus, Lin., is known as *laurestine* or *bastard laurel*, the *laurier-thym* of Southern France, on account of its evergreen, glossy leaves, which are entire and slightly revolute at the margin, and hairy on the nerves beneath. It is occasionally met with in cultivation, and produces black-blue drupes, which are said to possess cathartic properties, and are, in some localities of the Mediterranean basin, employed as a remedy in dropsy.

Viburnum odoratissimum, Ker., from China, is likewise occasionally met with as an ornamental shrub; it is evergreen, and has the leaves somewhat toothed and dense cymes of white, very fragrant flowers.

Viburnum lantana, Lin., occurs in thickets of central and southern Europe, and is known as *litby tree* and *giddy berry* (Schwindelbeere). The grey-brown, smooth, or, when young, mealy pubescent bark has an acrid taste and produces blisters when applied to the skin in the fresh state. The leaves are oval or ovate, sharply serrate, and mealy pubescent on the lower surface, have an astringent taste, and were formerly used in diarrhœa and similar complaints. The fruit when fully ripe is black, mucilaginous, sweet and astringent, and was employed in various inflammatory diseases. The branches have been used for making pipe stems.

Chemical Investigations.—The species mentioned above comprise all, I believe, which have been more or less employed in medicine, and of those only two have been subjected to chemical investigations.

During his patient and elaborate researches on the constitution of fats, Chevreul observed in the berries of *Viburnum opulus* a volatile acid, which he recognized as identical with the phocenic acid discovered by him in the fat of the dolphin. Afterwards Dumas proved phocenic acid to be identical with valerianic acid. H. Krämer (1834) examined the volatile acid obtained from the bark of the same shrub, compared this *viburnic* with valerianic acid, and found it to differ from the latter in odour and in the characters of several salts; however, the analytical results obtained by L. von Monro (1845) appear to establish the identity of the two.

Valerianic, besides acetic and tartaric acids, was found by Enz (1863) also in the berries of *Viburnum lantana*, which contain likewise a tannin colouring iron salts green. Krämer found in the bark examined by him malic acid and tannin giving a blue reaction with iron salts.

The bitter principle called *viburnin* was isolated by Krämer from the ethereal extract of the bark by treating it with hot water, removing the tannin from the solution by means of hide (parchment), and decolorizing afterwards with animal charcoal; the colourless liquid left on evaporation a light-yellowish mass, which yielded a nearly white powder, of neutral reaction and purely bitter taste; it was slightly soluble in water, more freely in alcohol, and on incineration left a little ash.

Enz found in the fruit of the species mentioned an acrid and a neutral bitter principle, the latter being yellow, hygroscopic, readily soluble in water, and uncrystallizable, even after dialysing it; the fruit was boiled with lime and water, the filtrate neutralized with muriatic acid and treated with animal charcoal; the latter was washed, dried and exhausted with alcohol, the solution evaporated to a syrupy consistence, deprived of the acrid principle by ether, and then evaporated.

Leo's experiments (1834) for determining the nature of the colouring matter of the fruit of *V. opulus* did not yield any important results.

The remaining constituents were those very generally distributed throughout the vegetable kingdom, such as pectin, resin, fat, gum, etc. It would be of interest to ascertain the nature of the bitter principles contained in the two first-named species, both of which are indigenous to this country and called black haw.

ANTISEPTIC DRESSINGS IN GERMANY.*

An article with this title, in a recent number of the *Progrès Médical*, gives an account of the antiseptic materials which seem to have superseded Lister's carbolized gauze, and which claim for themselves greater economy, diminished irritability, and freedom from liability to poisoning.

Thiersch has come to the conclusion that a saturated solution of salicylic acid—that is to say, 1 to 300—prevents putrefaction of the blood and secretions of a wound, while it produces no irritating effect upon recent or granulating wounds, and gives no cause for alarm by the passage of salicylic acid into the circulation. He uses a solution of salicylic acid for washing instruments, and the hands of the operator and his assistants. The spray is of salicylic acid, which proves, however, very irritating to the mucous membranes of the persons engaged in the operation. The dressings are simple enough. Salicylic acid being non-irritant, no protective is required, according to Thiersch; but, at least in healing surfaces, the protective has the additional advantage of protecting the granulations and the delicate new epithelium covering them from the danger of sticking to and being injured by the dressings on their removal. But Thiersch uses no protective. He places immediately upon the wound a layer of wadding containing 3 per cent. of salicylic acid; then another layer containing 10 per cent.

Blaser, pharmacist to the hospital at Leipzig, employs the following formulæ for the preparation of these dressings. For the 3 per cent. wadding: Dissolve 750 grams of salicylic acid in 7500 grams of alcohol of specific gravity 830. Add 150 litres of water at 70 to 80° cent. (158 to 176° Fahr.). Place in the mixture 25 kilogrammes of cleaned wadding. For the 10 per cent. wadding: Dissolve 1 kilogramme of salicylic acid in 10,000 grams of alcohol of specific gravity 830. Add 60 litres of water at 70 to 80° cent. Place in the mixture 10 kilogrammes of cleaned wadding. To saturate the wadding he uses a shallow vat, in which it is laid layer by layer, taking care not to put in more than two or three kilogrammes at one time, and that one layer is well saturated before the next is put on. When all are in, they are to be turned over, so that the bottom one comes to be at the top and left for ten minutes; then removed; and, as they cool, the salicylic acid crystallizes out. Finally, the the wadding must be dried in a warm place. Thiersch has also tried a dressing composed of jute saturated with salicylic acid; but the powder was disengaged in large quantities, and was extremely disagreeable to the surgeon; and it proved, besides, too permeable to the secretions of the wound, being less cohesive and fine than the wadding; so Thiersch himself has abandoned it.

Kohler, Medical Director-General of the Prussian Army, has suggested the use of carbolized jute. The preparation is very simple. The jute is made up into cakes one to two centimetres thick, fifteen centimetres in diameter, and weighing four or five grams. They are left to soak some hours in a five per cent. solution of carbolic acid, and are then left in two per cent. solution until required for use. To apply them, the wound is covered with a slip of gutta-percha intead of the protective; then some cakes of jute; and the whole is kept in place by a gauze bandage. It requires to be renewed every three or four days; earlier, if there be discomfort, or the discharge have come through; later, if the patient remain well. It is calculated that Thiersch's wadding is about a third cheaper than Lister's gauze, while Koehler's dressing only costs about a twentieth of the price of the latter. Cheaper, and at the same time efficient, antiseptic dressings are desiderata, and we think that these may be found as useful here as they are said to be in Germany.

* From the *British Medical Journal*, March 9, 1878.

THE PREPARATION OF PEPTONE.*

In the session of the Pharmaceutical Society of Berlin, of December 18th, 1877, Mr. Hobe read an interesting paper on the above subject, for which we are indebted to the *Pharm. Zeitung* (No. 102).

The best process for preparing the so-called peptone, or pancreatic meat-solution, is due to Dr. Adamkiewicz. Fresh blood is converted into a colourless mass by quirling and protracted kneading, followed by washing with frequently renewed soft water, holding in solution a small quantity of ammonia. The pressed white fibrin thus obtained is comminuted into fine shreds in capacious dishes, and covered with a large quantity of water containing 0·2 per cent. of hydrochloric acid. The fibrin thereby soon swells up, and gradually becomes converted into a pellucid jelly, which is now ready for the addition of the ferment, namely, pepsin. The latter is obtained from the mucous membrane of the hog, and for the present purpose is preferably extracted by means of glycerin. Alcohol is first added to the finely cut membranes, in order to coagulate the albumen, after which they are dried by exposure to air, and then covered with glycerin, which abstracts the pepsin in the course of a few weeks. The clear yellowish-red glycerole of pepsin is poured over the fibrin-jelly, and the whole heated for some time in a water-bath at a temperature of 50—60° C. (122—140° F.) The compact mass soon begins to liquefy, and is coverted finally into a thin fluid of grey opalescent colour. In from two to five hours large masses of fibrin may in this manner, as it were, be digested. The crude liquid is now separated by straining from any undigested shreds, and carefully neutralized with sodium carbonate, which causes the separation of a flocculent grey precipitate, the so-called para-peptone. This is removed by filtration. The filtrate, which has a clear straw-yellow colour, is faintly acidulated, once more filtered and evaporated to the consistence of honey at a temperature not exceeding 70° C. (158° F.).

Peptone is distinguished from ordinary albumen by its proneness to solidify in the cold, and to return to a liquid state when heated, being thus just the reverse of albumen. For internal administration, it has been found best to mix it with extract of beef in the proportion of 5 parts of the latter to 100 parts of peptone. Sixteen grams, or one spoonful, of this peptone are equivalent, in nutritive power, to 20 grams of lean meat. A dry peptone may be prepared by precipitating the original liquid with alcohol, treating the precipitate repeatedly and for some time with alcohol and ether, then dissolving in a little water, and drying at 30° C. (86° F.). In this state it forms a glassy, brittle mass, easily pulverizable and readily soluble in water. Long keeping is said to impair its solubility. It has a neutral reaction, and reduces alkaline copper solution.

* From *New Remedies*, February, 1878.

The Pharmaceutical Journal.

SATURDAY, MARCH 23, 1878.

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PROSECUTIONS UNDER THE PHARMACY ACT.

IN order to place clearly before our readers the precise nature of the prosecution of Mr. WILLIAM MACKNESS and the London and Provincial Supply Association by the Pharmaceutical Society, we purpose to recapitulate briefly some of the more prominent points referred to in the report published last week, so that they may be considered in connection with the magistrate's decision, which is reported at p. 759 of the present number of the Journal.

The London and Provincial Supply Association, Limited, appears to be a joint stock company carrying on various descriptions of retail trade in Tottenham Court Road, and among others the business of a chemist and druggist. As appears from the statement of the defendants' counsel, this business was originally carried on under the designation of the London and Provincial Supply Association, and up to February last the sole proprietor of it was Mr. WILLIAM MACKNESS, who, being unregistered according to the requirements of the Pharmacy Act, had thus committed a violation of the fifteenth section of that Act, which rendered him liable to pay a penalty of five pounds. Mr. MACKNESS upon being communicated with on behalf of the Registrar, and consulting his solicitor, found he was in the wrong, and acting under the advice given him, paid the penalty, sending at the same time an intimation that he was taking steps to terminate any violation of the law. These steps, however, did not consist in the simple and effectual expedient of ceasing to keep open shop for the retailing, etc., of poisons, but were devised by having recourse to the provisions of the Limited Liability Acts, and some time after the payment of the penalty Mr. MACKNESS sent a letter to the Society's Solicitor stating that he had sold his business to the London and Provincial Supply Association, Limited.

It does not appear that beyond the addition of the word Limited to the title of the Association, there was any material change in the conduct of the business, for the same labels that had been used prior to the change, continued to be used afterwards. Mr. MACKNESS was still a proprietor, and several other persons of the same name were among the limited number of shareholders. The counter in the shop had the appearance of being an ordinary chemist's counter, and during both periods it appears that Mr. H. E. LONGMORE, a registered chemist and druggist, was engaged by Mr. MACKNESS to conduct the business, and his name appeared upon the labels.

Up to February it was admitted that Mr. MACKNESS was responsible individually for anything done by Mr. LONGMORE, who was then acting as his assistant; but after the transfer of the business to the limited company, Mr. LONGMORE was made a shareholder, and it was contended that Mr. MACKNESS was then no longer responsible for his acts, although it appears to be admitted that Mr. MACKNESS was virtually still the proprietor of the business.

The three summonses brought before Mr. NEWTON last week at the Marlborough Police Court were taken out under the seventeenth section of the Pharmacy Act, which provides that any poison sold retail shall bear the name, the word poison, and the name and address of the seller.

The first summons was against Mr. MACKNESS for having sold poison on the 28th December last, inasmuch as it was contended that in addition to the penalty incurred under the fifteenth section of the Pharmacy Act, he had incurred this further penalty under the seventeenth section of the Act. In regard to this case, Mr. MACKNESS pleaded guilty, but threw himself upon the mercy of the Court upon the ground that he had already paid a penalty of five pounds. His counsel also argued that the penalty here sued for being for the same act of negligence this circumstance should induce the magistrate to inflict only a nominal penalty, and Mr. NEWTON looking upon that as equivalent to his having paid the penalty already, took the most lenient view of the case and only ordered him to pay the costs of this summons.

In regard to this case, however, the fact is not to be lost sight of that there are really two distinct penalties under two separate sections of the Pharmacy Act. That the payment of one penalty does not remove liability to the other, may fairly be inferred from the circumstance that each is to be sued for in a particular manner, the one being incurred by carrying on the business of a Chemist and Druggist without being registered, while the other penalty is for the protection of the public in regard to the manner in which the sale of certain articles is conducted. A person carrying on business in violation of the provisions of the Pharmacy Act may therefore by one and the same act render himself liable to the two penalties.

The second summons was against Mr. MACKNESS and the London and Provincial Supply Association, Limited, for having, on the 4th February sold poison without having labelled it with the name and address of the seller. The poison sold was red precipitate, and it was labelled with the name of the article, the word poison, together with the words, "London and Provincial Supply Association, 113, Tottenham Court Road, London, W. H. E. LONGMORE, Chemist and

Druggist," this label being similar to those used before the conversion of Mr. Mackness's business into a limited liability company. It was contended by the defendant's counsel that in this case every requisite of the Act had been complied with, and a long discussion took place as to who was to be regarded as the seller of the poison, whether Mr. Mackness, the London and Provincial Supply Association, or Mr. Longmore, the result being that notwithstanding the words of the seventeenth section of the Pharmacy Act, "that the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller," and the argument that the object of the Act was to afford protection to the public by having on every article sold the name and address of the person against whom, in case of injury, an action would lie, or who, in case of neglect, would be liable to a prosecution for manslaughter, the magistrate leant to the opinion that Longmore was the seller. In giving his decision on this case he held that the law had been complied with, and he dismissed the summons.

The third summons was against the London and Provincial Supply Association, Limited, for the sale of poison labelled as such, but without any name and address. In this case there was little room for defence, but legal ingenuity was exercised in the attempt to make out that if an offence against the Pharmacy Act had been committed, it was without rendering anyone liable to a penalty since it had been committed by an intangible entity, to wit a corporation, which it was contended was not amenable to proceedings in a police court, and could not be sued either by indictment or by summary information. Mr. Newton, however, was not disposed to entertain this idea of the existence of a corporation that was above all law, and though the defendants' counsel suggested the possibility of a difficulty in getting at the goods of the corporation or in committing anyone to prison, Mr. Newton thought he could find someone to do it.

The point to be determined was whether the word "person" in the seventeenth section of the Pharmacy Act included a corporation, and whether such a corporation—a joint stock company for instance—could be sued for penalties under that section. The case was therefore adjourned to last Saturday to allow of further inquiry on this point and with the view of sending a case up to a superior court if requisite.

As will be seen from the report published at page 759, the course contemplated by the magistrate of sending a case up to a superior court was not carried out by him, although provision had been made for this contingency by securing the appearance of Mr. Lumley Smith as counsel to represent the Pharmaceutical Society.

In the interim the Act 7 and 8 Geo. IV. had been found to apply to such cases as those in question, and consequently Mr. Newton decided the third summons as well as the others, by finding that the London and Provincial Supply Association, Limited, had not complied with the 17th section of the Pharmacy Act, and taking all the facts into consideration he ordered the defendant to pay a penalty of fifty shillings and costs.

Mr. Newton's decision has at least established one thing of no small importance in regard to the attempted evasion of the Pharmacy Act by unregistered persons, even when associated together into a corporation. Such associations cannot escape from liability to penalties under the 17th section of the Act by pleading that they are not comprised within the designation "person," since the Act of Parliament brought forward in the course of the adjourned hearing provides a sufficient remedy for any apparent defect in the wording of the Pharmacy Act itself.

AN UNEXPLAINED EXPLOSION.

A few weeks since an explosion occurred in a candy manufactory in New York, resulting in the loss of twelve lives, and the destruction of the building, the cause of which has not yet been ascertained in any of the more commonly recognized conditions that induce such disasters. It appears, however, that a large quantity of starch was used in the building in preparing the moulds, and it is thought probable that the atmosphere may in this way have become charged with a fine powder which igniting caused all the mischief. Similar explosions are known to occur in flour mills, and a short time before the roof of a linoleum factory in Staten Island had been blown off, through the ignition of cork dust, diffused throughout the atmosphere of the building. It will be remembered that this subject was dealt with two years since in a lecture on accidental explosions, delivered by Professor Abel, at the Royal Institution, the lecture being reported in this Journal (vol. vi., pp. 73 *et seq.*)

DUBOISIA MYOPOROIDES.

Just as we are going to press we are informed by Mr. A. W. Gerrard that he has obtained from the *Duboisia myoporoides*,—the plant which was the subject of a paper read at the last Evening Meeting of the Pharmaceutical Society, by Mr. E. M. Holmes —a powerful alkaloidal substance that he proposes to describe more fully in an early number of this Journal.

DEATH OF M. LAMY.

The death is announced of this celebrated French chemist, who in 1862, and almost simultaneously with Mr. Crookes, succeeded in isolating the metal thallium.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association will be held on Thursday evening, March 28th, at 8 o'clock, when the following papers will be read:—"Note on the Various kinds of Valerian," by Mr. W. R. Atkins; "The Action of Glycerine upon Borax," by Dr. A. Senier and Mr. A. J. G. Lowe; "The Flame Test for Boracic Acid," by Mr. W. B. Mason.

Transactions of the Pharmaceutical Society.

NORTH BRITISH BRANCH.

THOUGHTS ON BOTANY*—*continued.*

BY H. B. BAILDON, B.A. CANTAB.

(*Concluded from p.* 735.)

The remark will not be out of place here, and indeed has in great measure been led up to, that the attack upon theological positions, which has been inaugurated and carried on from the basis of operations furnished by the recent discoveries of physical science, may be impugned on the grounds that the basis so obtained is not broad enough to justify the superstructure of negation and atheism which is sought to be reared thereon; and what is more immediately relevant in the present reference, the kind of testimony upon which the facts they appeal to rests, and is, in a sense, of a low order. What is meant is, that however brilliant the intellect by which scientific generalizations are made, the witness to the facts is that of the physical senses employed in complete independence of the moral and æsthetic faculties, and this necessarily so, because for such faculties to interfere during a scientific research would be to colour and obscure that cold and colourless light in which the man of science desires to view his facts. There exist, therefore, other series of facts, which by their very nature must rest upon testimony involving the use of these higher faculties. These other facts lie beyond the sphere of the student of physical science so long as he appears in that character only. But whenever he intrudes his conclusions into the sphere of theology, or as we may call it, in order to evade the difficulty the term involves, cosmology, the study of the universe in all its phases and relations, he must be prepared to find even his own facts viewed in new relations and taking very different aspects, while he will also be confronted by arrays of facts equal in importance to his own, but which could not be established by the methods he had made use of. But it is too often the case that the votary of a special branch of science fails to perceive and acknowledge the force and validity of deductions drawn from investigations other than his own. Hence it is that we may behold the sorrowful spectacle of a learned professor, launching out into positive invective against a study which in reality offers a necessary complement to his own, or the no less sorrowful one of an eminent scientist assaulting with iconoclast enthusiasm the inmost citadel of faith. Still we may congratulate ourselves that they are not men of the very first scientific rank who so conduct themselves. It is not a Sir William Thomson who emits tirades against metaphysics nor does Darwin in person head the crusade of atheism.

I trust that in diverging into these considerations I have not caused you to lose sight of the point I am endeavouring to establish. My aim was to repel in anticipation the charge of sentimentality which might otherwise have been urged with seeming effect against such views as those here expressed. To this end I attempted to show that the statement that beauty belonged to the genus to which I referred was really as much capable of proof and establishment in the rank of a fact as common place propositions which no one ventures to controvert. Now by sentimentality in its bad sense is meant, or at least ought to be meant, that state or mood or habit of mind, in which facts are disregarded or undervalued, and preconceptions and impulses permitted unrestrained predominance. It is sentimental to bestow charity indiscriminately and therefore mischievously, but it would be a gross profanity to stigmatize as sentimental an act of wise generosity and intelligent, timely benevolence. Sentiment, indeed, depends for its value on its relation to facts. If it disregard or misconceive them it is misleading; if it respect and understand them it is a sacred guide. But withal there is the fact, too frequently neglected or forgotten, that sentiment is itself a fact, a phenomenon as undoubted in its existence as the solidest matter, the best established law. Man is not man apart from sentiment, as an atom is not chemic apart from its affinity; sentiments are the affinities of the soul. We may then, I think, with all respect to the soberest and the sternest facts that science can lay before us, still permit ourselves not only to reap delight but also to reinforce our highest and best hopes from the beauty the fern world presents to us. Undiscouraged may we re-measure in imagination those æons that we are told separate us from the era of the Acrogens, and re-picture to ourselves the splendours of those solitudes primæval, where moss and fern and lycopod seem entwined in silent struggle for empire and supremacy; where in glory unregarded the sunlight smote through tangled and glistering vistas of tropic frondage, while yet the dawn rose unsaluted of any song bird and sundown built its brilliant cloud dreams unbeheld of man. From a spectacle so impressive in its mighty repose, so tranquilising in its mute imperceptible progress, we would gather not chilling inference of human littleness or nature's impassivity. But we would the rather feel a solemn elevation in that so vast and imposing a prelude, an overture of such broad and stately movement should precede the drama of life, feeling thereby assured that preparation so leisurely and ample, an apparatus so elaborate and splendid, are the prophets and precursors of such action and event as shall prove themselves of equal and adequate grandeur. That colossal past we now contemplate is no cumbrous pyramid to fix our hopes for ever in the dust. It is rather the massive immovable piers and foundations, whereon without sound of hammer or any instrument, shall be up reared the temple of the future.

Nor here, although language metaphorical has been used, can the hue and cry of "sentiment" be permitted. To the expert in physical investigations we appeal, it may be, against himself. Have you not, we ask, with elaborate patience and study discovered for us, and pointed out to our delight and edification the extraordinary economies of nature? No extravagance is allowed in her household. The disused organ dwindles, the unnecessary defence is removed. Is nature then only "penny wise and pound foolish?" A miser of the scraps of matter and force, and yet a spendthrift of centuries and of races? To us this is inconsistent, incredible; so, friend, is not our sentiment in harmony with your fact? Is not our faith in the future but the prolongation of the line you yourself have drawn for us?

It would be as undesirable as tedious to review the whole system of plant life with even that degree of detail with which those parts about which we have been hitherto concerned have been scrutinized and commented upon by us. It is our belief, or at least mine, that however great the range and orbit of nature; however multifarious and multitudinous its phases, it remains a seamless web, woven on one loom, a single organism, as it were, with one spine of purpose and character running its whole length. Still it is desirable in an attempt to establish any case that a sufficiency of corroborative evidence be called; and therefore, we shall not hesitate to throw up additional buttresses and supports to a thesis already advocated, wherever we find fit opportunity and material.

But before we finally leave the cryptogams, *i. e.*, those plants in which the leaf or frond represents the highest specialization of function, it may be well to devote some thought to this organ itself. Its importance cannot be exaggerated, it is the great typical and representative organ of plant life. If we could but understand how a leaf grows and why it thus grows, no other problem of botanical science would remain sealed to us. But we do not. To a certain extent we know how it grows, having discovered the materials of which it is built up, and some

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, Feb. 22, 1878.

of the chemical changes which lifeless matter undergoes ere becoming part of the vitalized tissue. The conditions of growth are likewise ascertained. We are thus enabled to kill a plant and encourage its growth; but in other respects nature is equally mysterious and obstinate. No one can, nor indeed ever will, at least upon mechano-chemical grounds, explain the shaping of the simplest leaf, nor could all the *savans* of Christendom induce a daisy to grow a dandelion leaf, or an elm to produce a single acorn. From germs structurally similar, often chemically identical, plants of complete diversity spring, not shaped by the apparently vast surrounding forces, but fashioned by an apparently feeble inner law. This secret, mysterious vital power, this invisible, undescried formative influence, which is to the plant exactly what original character, that human mystery which is all but the whole of human fate is to man, is a force more subtle and no less compelling than the harder, larger, ruder forces of which this planet in its infancy was the playground and arena. Let it not be supposed that this is said in ignorance or disregard of the fact that all vital energy is conditioned by these physical forces. But let us not confuse relation and identity. One individual, say a child, may have his life conditioned by the action of others, and may perish or survive according to the treatment it receives. We do not, however, argue from that the identity of the child and the persons on whom it is dependent. No more can we consent to identify that directive energy by which the form of an organism is determined with those forces by which its existence is conditioned and supported. This is a point not of small, but of the very last and highest importance. It indicates the Thermopylæ which must be held at all risks against materialism, whose thesis is that all sublunary existence can be accounted for by those properties with which matter in its unorganized condition was primarily endowed. If a stand is to be made, it must be made on the threshold of life; because if it once be established that any life is to be accounted for and has been caused by the original qualities of matter alone, there remains no point at which a stand can be made, at least until we come to the region of consciousness. On the other hand, if this position can be secured, materialism is held at bay and prevented for ever from threatening the domain of humanity. For if these supposed omnificent properties do not account for the formation of a frond, still less can we expect to find in them the promise and the potency of the mind and heart of man.

There requires no apology for the assertion that the shapes of leaves have never yet been accounted for, because it is a simple indisputable fact, easily proved so far as proof is required by a citation of an attempt made by the eminent De Candolle to explain leaf-formation. His theory is to the effect that "the shape of the leaf may be viewed as dependent on the distribution of the veins and the quantity of parenchyma scattered through their interstices—the general outline being determined by the divisions and directions of the veins, by the greater or less abundance of parenchyma, through the midst of which the veins are distributed." The least amount of reflection makes it evident that this is no explanation of cause whatsoever; for obviously while the direction of the veins and the proportion of parenchyma constitute the elements of the leaf-form, they are not the cause of it.

What we want to know is what determines the direction of the veins and the quantity of parenchyma. The above explanation, if it can seriously be regarded as such by the author or any one else, is exactly as intelligent and intelligible as an explanation of the form of a statue would be, which consisted in saying that it depended on the bulk of marble left in one part and chiselled off at another. Both statements would be true, but neither explanatory.

Of course it may be argued that although the required explanation is not forthcoming at present, it is sure to come to hand in course of time. To this it may be replied that such a belief implies a faith in the method employed which we do not possess, and we therefore decline in the interests of science to admit a proposition that still awaits proof. If then, a breakdown occurs in this intended triumphal procession of matter so soon after setting out, it seems improbable that the goal will ever be safely reached.

There are two aspects or relations in which it will be convenient and instructive to regard the leaf, viz., its relation to man as an object which must meet his eye, and its economic functional relation to the plant of which it forms part. The latter is that chiefly regarded from the strictly scientific and especially from the Darwinist point of view, but the other clearly demands consideration. Not a little remarkable is it that the æsthetic and the functional importance of the leaf vary to a great extent together, and bear a sort of proportion. In the ferns, for example, the leaf is the all-in-all of the plant, both as regards functions and ornament. While performing the absorptive, assimilative and reproductive offices it never fails to exhibit at least a comely and often an exquisite form. Among flowering plants, however, the leaf, having lost its functional supremacy, seldom if ever asserts a decorative precedence. In the case of those plants popularly called "flowers" the leaf is almost always æsthetically subordinate to the flower, the flower being really the leaf in its highest phase of beauty; the aim of the plant, or its main effort, being apparently to blossom. But in the case of large trees, whose object is rather the upbuilding of trunk and the preservation of the whole, both the individual flowers and leaves as a rule are subordinate in decorative value, the form of the tree, and the effect of flowers and leaves as massed upon it, being the points to which attention seems directed. Thus the flowers of our forest trees are usually green and inconspicuous, at most affording, before the expansion of the leaves, a graceful but scant embellishment; and one can well perceive how much more in accordance with the sober dignity of treehood is such chaste decoration than anything more brilliant and ornate. An oak pranked with white blossom or an elm garlanded with yellow florets would appear as inappropriate as a soldier with butter cups in his hair or a sage with daisies round his hat. (It is quite possible that the soldier or the sage might please us so decorated, but not unless we understand that childish hands had set the flowers there in loving frolic.) But admitting this limitation, that the leaf is often subordinate and therefore shows no ostentatious elaboration of form, it still may confidently be maintained that the great majority of leaves have a tendency to beauty of design, most frequently amply fulfilled. Mr. Ruskin in his beautiful and interesting, if also erratic and immature, work on botany ('Proserpina'), to which both now and heretofore I am largely indebted, proclaims the laurel, or as he calls it, Apolline, leaf to be the noblest of leaf forms. I have no intention to dispute his dictum on this point, but in reference to what has gone before, wish to say that, while as a tree leaf, a citizen of a large commonwealth of leaves, in which it is intended that the individual shall not be missed but secretly replaced, it may be the king of leaves, I would still assert that as a piece of sheer beauty it cannot be compared with any of the more graceful fern-fronds.

There is one principle which I should like to ennunciate clearly and to emphasize, seeing that it may save us much disappointment and gloom in our studies of nature. It is this, that Nature, I use this term in its personal sense as being much more reverent and appropriate to the occasion than a continual reference to the Deity would be, does not aim always at doing many things at a time, or at least usually exhibits one aim as dominant over the rest. Thus in plant life, seeing that plants form the garment of the earth, and must be continually seen of men, the leading aim is often to all appearance beauty; while in the case of animals, which have the power of motion and ability to avoid man when there is hostility between them, the result aimed at is rather strength, activity and self-defence, although often extreme grace or dignity of movement is likewise attained. Nor, on the other hand can we often, if ever, find in nature a one-ideaed action; other ends appear to be kept in view even though one seem largely to predominate. Thus, while, as we have observed, leaves tend to beauty of individual form and also of combined effect, they never fail in fulfilling their debt of utility to the plant to which they belong. They are no otherwise made than in that mode best fitted, so far as we can judge, to the necessities of that plant. And because they are so admirably made in this respect, man must forsooth, raise his heel against nature, and cry, "There is here no wonder and no divine design, plants are perfect in their place because the imperfect have been eliminated in a struggle for existence." It is somewhat hard on Nature to turn her perfection of utility against herself. For it is clear that, whether an organism comes into being by creation or evolution, the fact of its existing at all argues a harmony between it and its environment, involves a quality of utility in its structure; for to say that its structure and faculties are unfitted to its environment, is to pass sentence of death upon it. So that really no argument contrary to a creative hypothesis can be drawn from the often self-regarding economy of an organism, seeing it is a necessity inherent to the circumstances; but, on the other hand, an important inference may be drawn from the observation of the fact that while apparently so completely self-regarding in their economy they nevertheless are linked by relation of utility, and become adapted to perform services to parts of creation which cannot be looked upon as forming part of their immediate environment. Thus, while it might be difficult to prove *seriatim* that all other beings are constructed with reference to man,—for it often happens that by the very ill-adaption, as it seems, of some creature to man and his comforts that creature plays an important part in the development of the higher human faculties,—it remains and will remain an impossibility to prove that Nature is devoid of provisions for the eliciting of, not only lower energies and inferior faculties, but even the highest qualities and loftiest endowments of man. Certain is it that the student of nature, whether he seek truth or pursue beauty, need never weep the tears of an Alexander for new worlds to conquer. If he do, they will be, like those of the Macedonian, tears also of ignorance. The only limits we have yet discovered are the limits of our own faculties. An improved telescope apprises us of a score of unknown systems; a higher power attained in the microscope may multiply by thousands the population of a drop. Nor is the increase in mere quantity and number. Beauty behind beauty, and wonder behind wonder greet us as we advance. Nature is no piece of veneered and varnished elegance. Sawn through the centre, the graining is constant and undegenerate. No scamping is there in the workshop of nature, the smallest pollen-dust is bedight with delicate coatings, the most minute of diatoms has its tiny disc graven with a fair design. To me it is a mystery how any man can come from a contemplation of nature with the weary soul and the dreary creed of an atheist. Man may find, indeed, much that humiliates him, bidding him reflect that he is not the cynosure of the universe, seeing that the existence of the meanest creature seems fenced with like care to his own, causing him to speculate that as there are unfathomed deeps of being beneath him, so there may be heights as immeasurable above, and yet leaving him a conviction of his own possible dignity and worth, a creature for whose production past æons have laboured, the crown of the visible creation, and a confidence that the pervading power that has indued the meanest atom with indestructible existence, quickened dead matter with the wonder of vitality, and exalted it into the very home of feeling and palace of thought, cannot be such as to be careless of the souls of his children, callous to the destiny of man.

Provincial Transactions.

COVENTRY AND WARWICKSHIRE PHARMACEUTICAL ASSOCIATION.

The second general meeting of the above society took place in the Committee Room of the Provident Dispensary, under the presidency of Mr Councillor Wyley, on the evening of the 13th ult.

There was a fair attendance of students, evidently attracted by the title of Mr. Dewson's lecture:—"How to prepare for the Minor." The President having briefly opened the meeting, the Hon. Secretary (Mr. F. J. Barrett, F.C.S.) read the following list of donations to the library and museum:—

The Pharmaceutical Society, current numbers of the *Pharmaceutical Journal*; Messrs. Burgoyne and Company, *Monthly Magazine*; British Pharmaceutical Conference, 'Year-Book of Pharmacy'; P. Squire, F.L.S., 'Supplement to the Pharmacopœia'; Mr. F. Harwood Lescher, 'Elements of Pharmacy,' 'On the Microscope'; Mr. W. L. Scott, F.C.S., 'On the Microscopical Examination of Water'; Dr. Poore, 'Electricity in Medicine and Surgery'; Mr. S. U. Jones, 'United States Pharmacopœia'; Dr. Thorpe, 'Chemical Science,' 'Quantitative Analysis'; Mr. Kay Shuttleworth, 'Modern Chemistry'; Mr. J. B. Smith, 'Pharmaceutical Guide'; Mr. Bambridge, two old Pharmacopœias; Dr. Farquharson, 'Guide to Therapeutics'; Professor Roscoe, 'Elements of Chemistry'; Mr. Stephen Darby, 'Wittestein's Chemistry'; Dr. Nevin, 'Analysis of Pharmacopœia'; Dr. Hassall, 'Food Analysis'; Dr. Campbell Brown, 'Analytical Tables'; Dr. Lauder Brunton, 'Materia Medica'; Mr. Canning, 'Select Notes & Formulæ'; From the Publishers, 'Cooley's Latin Grammar'; Professor Barf, 'Inorganic Chemistry'; Professor Madan, 'Inorganic Chemistry'; Mr. Hodgkinson, a file of old prescriptions for the prescription book.

The Honorary Secretary also announced that he had received a number of valuable medical and surgical works from a distinguished London physician, who did not wish his name to appear in print. Mr. Axford proposed and Mr. Holdcroft seconded, and it was unanimously carried, that the best thanks of the members be forwarded to the various donors to the library of the Association.

Mr. Iliffe (Nuneaton), Mr. Pratt (Warwick), were unanimously elected members of the council.

The President then briefly introduced Mr. Stokes Dewson (Honorary Secretary of the Midland Counties Chemists' Association) as the lecturer of the evening.

The lecturer began by pointing out that the subject was too extensive to be properly dealt with in a short lecture, and he must therefore confine himself to a few of the more important principles to be kept in mind in reading for the "Minor."

In the first place he urged the necessity of cultivating habits of observation, so as to be accustomed to notice changes occurring in course of dispensing and seek for the causes producing them, and the nature of the results. The student should not, however, expect to write a formula for every cloudiness and precipitate which presented itself, as many would appear of uncertain or even unknown composition. Latin was a subject the student should aim at retaining; he would want it at the Minor. The speaker believed it was best for the student who was without a tutor to write out in full Latin the prescriptions from Pereira's 'Selecta,' and next day to correct them from the full unabbreviated form given at the end of the work. The Pharmacopœia, they must remember, was the compass of the pharmacist; this must be well got up, the composition and strength of all the preparations committed to memory, nor must they forget that the examiners required the processes to be explained; not only how a preparation was made but why it was so made.

The nose, he said, was an organ of great delicacy, but it required educating. The student should try to train his nose, for when well trained it was of wonderful service in the recognition and distinction of drugs and preparations. The student should practise the recognition of tinctures and extracts by smell and he would soon find that preparations in which at first he could scarcely find any odour had often very characteristic ones. Nor should it be forgotten that the nose could detect quantities of odorous substances so small as to completely elude chemical analysis. With regard to botany the student must not hope to get it up from books alone, he must go into the field, bring home wild flowers, sit down with Lindley's 'School Botany' or some such book, and examine what he has collected; he should not be disappointed if he cannot find all the medicinal plants he would like to see, but remember that a considerable amount of botanical knowledge could be got by the careful dissection and study of the commonest plants, buttercups, daises, clover, etc. He should collect such and try to write descriptions of them and afterwards compare the descriptions with those of the book, if he have no one who can correct them; this would give him confidence in the examination room at Bloomsbury Square. As to materia medica the student should bear in mind that examiners not only require the candidate to recognize the drugs presented, but also to say how they know them; this could be got up best by comparing the drugs, etc., with the descriptions contained in the Pharmacopœia, and carefully remembering the chief characters. An examiner had recently asked a candidate how he knew a drug (which he, the candidate, said was sassafras) to be so, the candidate replied "By the smell, sir." Then said the examiner, "If I had given you deal shavings which had lain long in the sassafras drawer, you would have declared them to be sassafras." The speaker recommended students never to trust to a single character in deciding the identity of a drug. Then, again, as to chemistry, he need not tell them it was an important subject. This could not be got up from books only; it was essentially an experimental science. The student could have no better book than Attfield's 'Chemistry' in preparing for the "Minor," but he must read a portion carefully and then go through the experiments, make the preparations, or the more important ones, and at the end of each group test for each metal; he could not do better than get a fellow student or assistant to give him pharmaceutical chemicals to examine after he had once been through the testing for the metals, and should on no account neglect to write equations for the changes he observed in the course of testing. After the student has gained some confidence in his results, he should then examine pharmaceutical chemicals as directed under 'Characters and Tests' of the Pharmacopœia. The lecturer warned them against supposing that all this required an expensive set of apparatus; a few shillings spent in test tubes, platinum foil, a Bunsen burner, etc., would provide apparatus with which a very fair acquaintance with elementary chemistry could be acquired. He concluded by explaining some examples of manufacturing processes which could be easily imitated on a small scale by such simple apparatus.

At the close of the lecture, which was well listened to and frequently applauded, Mr. T. Sellers (Vice President) proposed a hearty vote of thanks to Mr. Dewson for his lecture. The proposition was seconded and carried unanimously. The Honorary Secretary announced that the Council had arranged to commence the Minor class forthwith in the room they then occupied. On Tuesday the junior class would be conducted by Mr. Axford and other gentlemen, and the hon. secretary would take the senior class every Wednesday. The council had also appointed, as their teacher for Preliminary subjects, Mr. Gibbs who had kindly consented to instruct associates at reduced fees. He could heartily recommend all students who had not already passed their Preliminary examination to place themselves under Mr. Gibbs. They had also arranged to have a letter-box placed in the room into which questions, suggestions, etc., could be dropped, and at frequent stated times answered and considered. The books from the library would be lent out every Wednesday. He hoped that the classes would be a success, and that in six months time they would be able to send a batch of the more advanced students to Bloomsbury Square, and welcome them back again as registered chemists and druggists.

The Vice-President said it had been resolved to offer the following prizes for competition at the end of the present year, the prizes to consist of books, or chemical apparatus, selected by the successful student. Two prizes for Preliminary subjects, two for Minor subjects and a prize value one guinea for the best original essay on any subject of pharmaceutical or chemical interest, and half a guinea for the second best. He would particularly recommend every student to "go in" for the essay prizes. Select some subject of interest, thoroughly read up all obtainable information and then try to add some original matter or work out some unfinished problem connected with it. He concluded by saying that they had that evening heard from Mr. Dewson "How to prepare for the Minor," the members of the Association had provided them with the *means* of preparation, and it rested entirely with themselves whether they accepted Mr. Dewson's advice and the Association's liberal assistance. The examinations must be passed, unless they cared to remain unqualified druggist's assistants all their lives. The *only* way of passing successfully was by *work*, and the earlier they commenced their work the easier it would appear. They were growing older year by year, and as age increased disinclination for study increased, or business cares and responsibilities interfered. To the pharmaceutical, as well as to all other students, no more emphatic advice could be given than that contained in sacred writ.

"Work while it is called to day,
"The night cometh when no man can work."

A hearty vote of thanks to the President brought a successful evening to a close.

The first of a series of students' meetings of the above Association took place on the 27th ult. in the library. The deputy treasurer (Mr. J. Whiting) occupied the chair and there was a fair muster of associates.

A very interesting paper was read by Mr. J. W. Axford, "On Oleic Acid and its Combinations." After explaining its mode of manufacture and exhibiting various acids (kindly contributed by Price's Patent Candle Company), Mr. Axford glanced at the pharmacopœial oleates of ammonia, soda, potash and lead, and explained their preparation by means of equations. He then spoke of oleates of mercury, morphia, etc., which had been more recently introduced, criticized the use of oleic acids in various other preparations as suggested by Professor Tichbourne, and concluded by giving examples of the use of oleic acid, in forming oleates soluble in oils, such as cod liver oil and quinine, strychnine, etc., etc.

At the close of the paper a vote of thanks was accorded to Mr. Axford.

On the same evening Mr. Barrett gave his first lesson on "Minor Subjects," to be continued weekly.

LIVERPOOL CHEMISTS' ASSOCIATION.

The tenth general meeting was held at the Royal Institution, February 28th, 1878. The President Mr. T. Fell Abraham, in the chair.

The minutes of the previous meeting were read and signed. The donations to the library were duly acknowledged.

Mr. H. S. Jackson was elected a member, and Mr. J. C. Jackson elected an associate. The meeting was entirely devoted to miscellaneous communications.

The eleventh meeting was held March 14th. The President in the chair. The minutes of the previous meeting were read and signed.

The donations to the library were announced and thanks accorded the donors.

Messrs. George Taylor and J. H. Morris were unanimously elected members.

Mr. Symes said he had pleasure in presenting for the museum a sample of a Brazilian drug, "Caroba," the produce of *Jacaranda procera*, N. O. Bignoniaceæ. The genus is composed of elegant trees having much the habit of the fine leaved acacias. This drug consisted of the dry leaves with some twigs; it yielded an extract possessing a bitter and slightly astringent taste, of which he showed a sample. He was rather surprised at the large yield of this, viz., 5 lbs. from 23 lbs. of the leaves, or over 20 per cent. The drug is included in the Brazilian Pharmacopœia, and is also mentioned in Dorvault's 'L'Officine' as a component of the celebrated antisyphilitic confection. Dr. Symes added that Dr. Barnsley has prescribed it with advantage in skin diseases arising from syphilis. It is prescribed as an infusion, decoction, and fomentation; also in the form of extract.

In reply to Dr. Nevins, Dr. Symes said that caroba could scarcely be said to act like sarsaparilla; indeed to associate it with sarsaparilla would be to endanger its trial by a number of medical men, who either as the result of experience or prejudice regard sarsaparilla as valueless. This was really an active drug and one that he felt satisfied merited attention .There was the authority of Dr. Barnsley for its value in the class of complaints mentioned, and these complaints were in hot climates like Brazil somewhat formidable.

Mr. Edward Davies, F.C.S., contributed a highly interesting paper entitled "Notes on some Recent Additions to the Lists of Substances which ignite Spontaneously." The paper was illustrated with experiments, several of which were entirely new to the members present.

On the motion of Dr. Symes, seconded by Dr. Nevins, an unanimous vote of thanks was accorded Mr. Davies with acclamation.

ABERDEEN ASSOCIATION OF CHEMISTS AND DRUGGISTS.

This Association held its monthly meeting on Thursday, 14th inst. Mr. Strachan, secretary, occupied the chair, and introduced Mr. Giles to the audience, who delivered a lucid and instructive lecture upon Heat.

The lecturer set before his hearers a very complete and concise account of the various characters and actions of heat, tracing their discovery and nature, and giving a history of their practical utility and place in the economy of the universe, concluding by giving a critical summary of the various philosophic theories of the ultimate tendencies and results of cosmic heat. Mr. Giles's lecture was loudly applauded, and votes of thanks brought the meeting to a close.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday, March 14, when a paper was read by Mr. W. R. Dunstan on the "Chlorides of Iodine." In the course of his paper the author stated that only two definite compounds of chlorine and iodine had been obtained, the monochloride ICl, and the trichloride ICl_3. A tetrachloride is said to have been obtained in the solid state, a pentachloride in the state of aqueous solution.

Monochloride of iodine is prepared by passing dry chlorine gas into dry iodine until the latter is liquefied. A small quantity of trichloride is, however, always formed, and to free it from this the monochloride should be distilled from iodine at a temperature of 100° to 102° C.

The resulting monochloride of iodine may be obtained in crystals fusing at 24° to 25° C. to a brown oily liquid. It is soluble in alcohol, ether, and glycerine. Specimens of this substance and of its solutions were exhibited, and its action upon a number of substances, organic and inorganic, was described.

Trichloride of iodine is prepared by passing excess of chlorine into iodine. It can be obtained in yellow crystals, which will readily sublime; when heated chlorine is given off but is reabsorbed on cooling. One of the most interesting compounds of this body shown by the author was the chloriodide of potassium, a substance formed when chlorine gas is passed in excess into a solution of iodide of potassium. It is obtained in the form of yellow needle-shaped crystals, and quantitative analysis would point to the formula ICl_3KCl.

On the conclusion of Mr. Dunstan's paper a discussion ensued, in which most of the members present took part, and after passing a hearty vote of thanks to the author the meeting adjourned.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of the above Association, held on Wednesday last at 28, Baker Street, in a room kindly lent by the Council of the Quebec Institute, Mr. Princep, President, in the chair, a lecture was delivered by Dr. C. E. Saunders on the "Structure and Functions of the Human Body."

The lecturer stated that it was a laudable thing to make men acquainted with that which affected them so nearly as their own bodies—"the proper study of mankind is man"—and he therefore proceeded to bring before his audience in succession the various striking points of interest connected with the human skeleton, with the muscles, nerves, the respiratory, circulating, and digestive organs. He insisted on the proper cultivation of the brain, so as to produce a degree of subjection of the senses and passions to the intellectual faculty.

At the close of the lecture, which was listened to with much interest, Dr. Saunders replied to a few questions from members of his audience. After a hearty vote of thanks had been accorded to Dr. Saunders for his instructive and excellent discourse, and also to the Council of the Quebec Institute for the loan of the room, the meeting dispersed.

Parliamentary and Law Proceedings.

Prosecution under the Pharmacy Act.

The three summonses by the Pharmaceutical Society of Great Britain *v.* Mackness and the London and Provincial Supply Association, Limited, reported last week, were disposed of by Mr. Newton on Saturday the 16th.

Mr. Lumley Smith said he appeared on this occasion on behalf of the prosecution.

Mr. Newton said he understood the case was closed. All he wanted to know was who it was who sold poison on the 20th of February.

Mr. Sanders said a man of the name of Sharman, who was no longer in the employ of the Association. When this occurred of course they thought it right to dismiss him.

Mr. Newton: Was he an authorized person?

Mr. Sanders said, No, he was not. He was only in charge of the premises for a very short time whilst Mr. Longmore went to dinner, and during that unfortunate period Mr. Ward went to procure this oxalic acid.

Mr. Newton: Then you admit that there was an unauthorized person selling poison in your establishment?

Mr. Sanders: Yes.

Mr. Newton: Do you not think that is a clear infringement of the law?

Mr. Sanders: If we are liable as a corporation. That was the point I took last time.

Mr. Newton: Is not that a clear infringement of the law?

Mr. Sanders: By somebody; it may be an infringement by the man.

Mr. Newton: In your establishment; the poison was sold contrary to law.

Mr. Sanders: If the law applies to us it was so.

Mr. Newton: That is what I asked you the other day. Do you hold yourselves above the law?

Mr. Sanders: It was for that reason your worship adjourned the case that we should look at the law upon that point, and I have done so.

Mr. Newton: I want to knew exactly whether you do put yourselves above the law for this particular Act.

Mr. Sanders: If your worship will be kind enough to hear a few words from me I think I shall be able to put the case before you in a very tangible point of view.

Mr. Newton: Very well; what would you like to say upon it?

Mr. Sanders: You of course remember all about the case and that this matter was adjourned that we might have an opportunity of further considering the point. I have done the best I can to consider the point. I have looked up all the authorities I could refer to and I find as regards corporations that no doubt the general rule is that unless they are specially mentioned they are not liable, inasmuch as they are an invisible body, and the Legislature now is very careful to include these corporate bodies under the term "person." In the Judicature Act, for instance, there is an interpretation clause which says that the word "person" shall include corporate bodies. As regards civil proceedings, therefore, there cannot be much doubt, and the only question is about criminal proceedings. We know that as regards corporations they are often indicted for not repairing highways and so on, and they may under some circumstances be amenable to the law of libel, as we know from the case of the telegraph company which was held to be guilty of libel in sending a libellous letter. It would be very unjust on my part to attempt to beguile the Court or to attempt to deceive the Court in any way. I am bound to lay everything before the Court to enable it to give a proper judgment whether it makes for me or against me, and I must say in this case I have come across an Act of Parliament which appears to put me somewhat out of court on this point. In candour and fair practice I hope I should never think of concealing from the Court anything the Court ought to know, although it is against me, and if your clerk will be good enough to refer to 7 and 8 Geo. IV. I shall be able to explain better what I mean.

Mr. Newton: Do not you come under the ordinary Joint Stock Companies' Act without that?

Mr. Sanders: No, I think not.

Mr. Newton: Why not?

Mr. Sanders: We are now considering the Act of Parliament as regards the sale of poisons, and the question is whether "person or persons" includes a corporation.

Mr. Newton: I do not think there is anything turns upon that; you are a corporate body, but surely you are liable to the criminal law.

Mr. Saunders: Not generally. We should only be so under a statute. At common law we should certainly not.

Mr. Newton: To a certain extent.

Mr. Sanders: You cannot pursue a corporation. They have no individuality. You cannot point out any one in particular who has done wrong; you cannot take a corporation into custody.

Mr. Newton: What occurs to me is this: that if I say this summons will not do because it is against the London and Provincial Supply Association, Limited, and therefore I am to dismiss the summons, they will ask me for another summons as against the person who sold it.

Mr. Sanders: I do not wish to keep up the contention any longer.

Mr. Newton: I think you will agree, then, the question is this, What is the best to be done for the future?

Mr. Sanders: We know what to do for the future; our object is to show the Court that we really were conducting the business in a lawful way. I think you were satisfied of that the other day except in regard to this mistake.

Mr. Newton: The third sale I think was wrong.

Mr. Sanders: I want to make that conclusive to your mind because it may come before you again. There is an Act of Parliament, 7 and 8 Geo. IV., chap. 28, sect. 14; it applies very generally to these cases, and perhaps you will forgive me saying it may be useful to you again.

Mr. Newton: What is it called?

Mr. Sanders: It is called an Act for improving the administration of justice. It is the Act which did away with the benefit of clergy and so on. I have copied out the section.

Mr. Newton: Just read it.

Mr. Sanders: I admit, of course, it is against me, but I think it is right you should know how it is: "And be it enacted that wherever this or any other statute relating to any offence, whether punishable upon indictment or summary conviction, in describing or referring to the offence or the subject matter on or with respect to which it shall be committed, or the offender or the party affected or intended to be affected by the offence, hath used or shall use words importing the singular number or the masculine gender only, yet the statute shall be understood to include several matters as well as one matter, and several persons as well as one person, and females as well as males, and bodies corporate as well as individuals." That is whenever any statute makes an offence punishable and individuals are mentioned it shall include corporate bodies as well as individuals, "unless it be otherwise specially provided or there be something in the subject or context repugnant to such construction." I cannot contend there is anything of this sort in this Act, and that seems to me to give you jurisdiction with regard to a corporate body, and therefore they need not be mentioned in this Act inasmuch as they come under the provisions of this 14th section. I think that certainly concludes the legal view of the matter, and therefore with your permission I would say a word or two with reference to the merits.

Mr. Newton: I thought you admitted all that.

Mr. Sanders: I am going to say something in mitigation.

Mr. Newton: I thought you had closed.

Mr. Sanders: I was addressing you with regard to the penalty, and I should call evidence if necessary.

Mr. Newton: Now you are going on the merits. I thought you had closed the case.

Mr. Sanders: I closed the case as regards the facts, but I was going to make some observations with regard to the facts.

Mr. Newton: You admit the fact that this poison was sold in your establishment without being properly labelled.

Mr. Sanders: Yes.

Mr. Newton: You might have expected that proceedings would be taken against you because you had notice by the letter Mr. Flux wrote to you before. You had it clearly brought to your notice that you ought not to sell poison without having complied with the law.

Mr. Sanders: Of course there is every degree of criminality in these matters.

Mr. Newton: It is great carelessness allowing somebody to be in the shop who does not know his business or trade.

Mr. Sanders: He did know his business.

Mr. Newton: But he was away.

Mr. Sanders: He must be away at times.

Mr. Newton: But the public is not to be poisoned.

Mr. Sanders: Your worship will recollect this, that we did not sell this poison without giving all that which was the material matter.

Mr. Newton: Except this, that you did not put the label upon it.

Mr. Sanders: But we say oxalic acid and poison.

Mr. Newton: But you did not comply with the statute.

Mr. Sanders: The statute certainly ought to be complied with, but it is not of that importance as though we had sold this without putting "poison" upon it.

Mr. Newton: If you had not put "poison" on it I should have put on the full penalty.

Mr. Sanders: That is what I am addressing you upon. This is a question in which I think we may fairly ask for a mitigation of the penalty.

Mr. Newton: I have made up my mind before what to do under the circumstances.

Mr. Sanders: There is one observation I think I may make in justice to my client. When we were here before Mr. Flux said we were in the habit of selling poisons.

Mr. Newton: We have done with all that.

Mr. Sanders: I was going to say this. That observation appeared in the papers. It was very unjust and very untrue, and may have the effect of very much prejudicing our business. The fact is it was made up in the regular way but had not got a proper label.

Mr. Newton: I have to deal with these three summonses. On the first summons Mr. Mackness pleaded guilty and threw himself on the mercy of the Court because he said he had paid £5 under a sort of threat which was made to him by Mr. Flux that unless he would pay that money proceedings would be taken against him. I look upon that as equivalent to his having paid the penalty already, and I therefore only order him to pay costs of the summons upon that.

With respect to the second summons, I think that the London and Provincial Supply Association, Limited, have complied with the law, because they put "The London and Provincial Supply Association, 113, Tottenham Court Road," and the name of the seller, Longmore, upon the poison that they sold. I think, therefore, that summons fails, and I dismiss it.

With respect to the third, I think that the company is wrong. They allowed a man to sell poison, having had due notice given two months at least before that there was a suspicion against them for acting wrongly. They were wrong in allowing a man to sell the poison, not complying with the 17th section of the Act, and they should have had the name of the seller upon that packet. Therefore I think, taking all the facts into my consideration, on that summons the defendant must pay the penalty of fifty shillings and two shillings the cost of the summons.

Dispensing Memoranda.

[78]. Dissolve the pot. bromid. in ℥ij of water, add the sp. am. aromat. and ℥ij of mucilage, then dissolve the ferri et quin. cit. in a little water and pour into the first solution through a small funnel, afterwards adding rest of the water. The addition of mucilage appears to me more justifiable than straining out the quinine. W.

[83]. I have received the following prescription to dispense:—

℞ Ext. Ergotinæ . . . . . gr. iij.
Quiniæ Dis. . . . . gr. j.

Ft. pil. ter quaterve die sumenda. Mitte xviij.

Is there a definite preparation known as Ext. Ergotinæ?

INQUIRER.

[84]. Would any reader be kind enough to inform me of the formula for "Nervine Balsam," as I had a receipt to make up a few days ago in which ℥j of that preparation was ordered? SPES.

[85]. Will some one kindly inform me through the medium of the Journal which is the best excipient for a pill containing Aloes, Ipecac., Quinine, and Ext. Nucis Vom.? X. Y.

[86]. Can Ung. Plumbi Co., P. L., be made of a soft consistence? I have tried it several times and find that even with half the quantity of Emp. Plumbi it becomes hard and crumbly. The physician who orders it tells the patient that it can only be made by one firm in London.

Southsea. H.

[87]. How is it possible to produce a pill, containing all the active properties of the two ingredients ordered in the following prescription in one grain and a quarter? Such a pill has been produced to me as prepared from:—

Podophyllin Resin . . . . gr. ij.
Ext. Hyoscyam. . . . . ℈j.

M. fiat. pil. *six* (6).

Allowing that an ext. hyoscyam. durum, or even superlatively hard extract be used, is it possible to make a pill by heat meeting the views of the prescriber, it always being understood in terms of B. P. of consistence to form a pill. PRACTICE.

[88]. GLYCERINE OF BELLADONNA.—Can any reader oblige me with the formula for Glycerine of Belladonna, which was ordered in a prescription that I received this week? ANDREW H. CLELAND.

[89]. A CURIOSITY.—I shall be glad to know if any reader could conscientiously prepare the enclosed receipt, which is the most peculiar one I ever had presented.

Boston. W. R. FOWLER.

"Take conserve of burrage, buglos, red roses, each one ounce; balm, one ounce; saffron, a scruple; citron peel and shreds of myrobalans, candied, each one ounce; extract of wood aloes, each a scruple; pear, half a dram; red coral, ivory, each a dram; precious stones, a scruple; candied nutmegs, two drams; syrup of apples and quinces, one ounce."

[90]. Will you kindly insert the following prescription in the next issue of the Journal under "Dispensing Memoranda?" I should like to know if it could be dispensed so as to leave but little sediment:—

℞ Pulv. Bismuthi . . . . . . ʒiss.
Acid Hydrocyan., dil. . . . . ♏xl.
Sp. Amm. Fœtid. . . . . . ʒss.
Glycerini . . . . ʒss.
Potass. Bromid. . . . . . . ʒiss.
Liq. Calcis. . . . . . ad ℥xij.

M. Sum. ℥j ter die. T. E. T

[91]. I should be glad to know through the "Dispensing Memoranda" if it is possible by any order of mixing to dispense the following prescription without causing turbidity. It was sent out perfectly clear from one of the first houses in London, but I can obtain it so only by filtering, which gives the customer dissatisfaction:—

℞ Liquoris Plumbi Diacet. . . . . ʒiss.
Acidi Carbolici . . . . gr. xv.
Aquæ Rosæ Destill. . . . . ad ℥iij.

Misce, fiat lotio. A few drops to be poured into the ears night and morning.

Would it be right to separate the precipitate by filtration? A. W.

Obituary.

Notice has been received of the death of the following:—

March 14, at Kennet Lodge, Simeon Street, Ryde, Mr. Richard Taylor, Pharmaceutical Chemist, age 55. Thousands of visitors to the Isle of Wight, and amongst them it is to be hoped a fair number of chemists, have been confronted immediately on leaving Ryde pier, by the name of the deceased over the shop where now the name of a worthy successor, Mr. T. S. Flower, appears. Here Mr. Taylor carried on business for twenty-one years. He became a Member of the Society in the year of the great influx, 1853, but he passed the Major examination in November of that year—the well known names of Henry Deane and Charles Cracknell being appended to his certificate, with those of Davenport, Gale and Bird as Examiners. He did not study, however, for the sake of a diploma, but for the acquisition of knowledge, and consequently the acquirements thus obtained were not shelved amongst other obsolete stock, but were brought into daily requisition, and obtained for their possessor a sterling reputation as a pharmaceutical chemist. It was to the science of meteorology that he gave more particular attention; and in this field his observations were most careful and accurate, as his regular contributions to the local press testify. Upon his stores of information both the public and his *confrères* drew almost at pleasure, and speaking of things that he knew, Mr. Taylor was wont to express himself with a confidence that occasionally dispensed with the finer suavities of speech. He retired from business four years ago; and some of his fellow townsmen hoped that his intellect and abilities would have been devoted to the service of the borough, but he chose rest, probably induced by incipient symptoms of the disease which eventually carried him off to the regret of many friends.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Discrepancy of Examination Results.

Sir,—There is an order of people who are never satisfied with things as they are. It is peculiar at the same time that these same people can never say explicitly how they would wish things to be. It seems to be their particular mission and forte to grumble and keep up a certain amount of a disagreeable sense of dissatisfaction, so that people who take the management of affairs may never have the pleasure of regarding with complacence the work which they have done in their official capacity. To this order seems to belong Mr. Duncanson of Stirling. He grumbles about the Preliminary examination, simply, it appears to me, because he fancies that he ought to, not because he feels certain about the particular element in it with which he is dissatisfied. It is ridiculous and tiresome to have people continually grumbling about an examination like the Preliminary. The Preliminary is a very mild test of a student's scholastic knowledge; the questions are fair, and as they are chiefly elementary, very easy; the time allowed is sufficient to permit the candidate to reply to all the questions, and if he cannot make a pass in three hours, there is little probability that he would make a pass though he were allowed three days; the candidate who fails to pass very thoroughly deserves to be plucked.

That the percentage of failures in the arithmetic is larger than in the other subjects, need surprise no one. The Latin can be crammed by going over the first book of Cæsar two or three times, with a translation, and the rules of grammar —all that are required for this examination—can be easily committed to memory. The merest schoolboy should be able to pass in the English; that any one proposing to enter the trade should not know sufficient English grammar to enable him to pass is disgraceful to himself, and would be a slur upon the trade if it should take him. But the arithmetic cannot be crammed, for the questions can be varied, so that cramming in a particular direction is for little good. The fundamental principles of the subject must be thoroughly understood, and the powers of thought and reason cultivated, so that when the candidate is placed face to face with a numerical problem which he has not previously seen, he can by their legitimate exercise, and without external aid, readily solve it. According to published statistics of the Preliminary, some candidates have presented themselves for examination who failed to obtain a single mark in this subject. This shows very plainly that "the article," as Mr. Duncanson calls it, though it may be better than it was ten years ago, is yet slightly in want of improvement.

The examination would require to be very considerably cut down to bring it within reach of the capacity of these candidates. To blame the examination for the failure of these is more, I daresay, than even Mr. Duncanson would venture to do. Candidates will not take time and patiently master their arithmetic. They get possession of a few examination papers, do the sums therein, go upon chance, and of course get plucked. Would they but face their work honestly there would be fewer failures. The fault is not in the examination but in the candidates themselves. Besides, I do not consider it judicious in Mr. Duncanson to encourage this slipshod preparation, and going upon "spec," and he is most assuredly doing so when he proposes any lowering of the standard of examination and reduction of the "try again" fee; it is neither fair to the trade nor to the candidates. The standard of education of the trade is not as high as it might be, and retrogression in educational matters is not the order of the day. The candidates themselves will be the gainers by the higher attainments necessary to pass the more severe examination, and when once they have passed they will bless the necessity which was the cause of their additional exertions and consequently superior attainments.

With regard to Mr. Duncanson's third proposition, it is harmless and needs no comment. Further on, however, he says, "or a diminution in the number of points insisted on by the examining body, would, I submit, be a boon to the candidates." I fail to comprehend in what way this would be a boon to the candidates, unless that giving them encouragement to remain satisfied with a grossly insufficient elementary education can be so considered. It might, it is true, allow a few more to prepare and go up for the next examination, the passing of which would entitle them, pharmaceutically speaking, to be called "qualified" though certainly not educated men.

It is to a higher education, both of public and pharmacists, that we must look for the rescue of the trade from its present unsatisfactory condition. The education of the public is daily becoming of a higher kind, and the position which pharmacists are to occupy in the future, will be determined by the manner in which they keep pace with and adapt themselves to the higher requirements of the public.

To lower the standard of the examinations would be suicidal, and if any change be made in any of them, I feel sure that the Council of the Pharmaceutical Society will see the propriety of letting that change be in the direction of higher requirements.

Peter Boa.

1, *Carlisle Circus, Belfast.*
March 6, 1878.

Sir,—Kindly permit the insertion of a reply to the letter on the above subject in this week's number of the Journal.

Your correspondent might have observed that it was the Minor examination that I wrote about, and which attracted the attention of Mr. Schacht and other members of the Council.

I did not assert the superiority of the "short heads" over the other type, but merely gave it as a physiological opinion, or rather an ethnological fact commonly held by physiologists. Far less do I despise the other class, on the contrary I rather excused them on the ground of want of the same facilities (particularly time), and the absence, or at least possession in a moderate degree of the praiseworthy quality of indomitable perseverance so easily discernible as constituting part and parcel of the national character of the Scot.

Apropos of the Preliminary failures and the objection raised to the theory of their dependence upon the relative magnitude of the "centre of mind," I shall try to give reasons for the apparent anomaly.

1. As a rule, younger apprentices are taken in Scotland than in England, and in consequence thereof the primary education is more limited.

2. They are not old enough to stick so rigidly to the requisite tasks, nor comprehend them so well as in after years.

3. Youths in hilly Scotland do not mature so quickly as the inhabitants of the sunny south, hence the development of the brain of the former is not so proportionately large before they are out of their "teens" as after they have attained majority, as in the case of the latter.

Still, I would not take the last examination as a specimen —indeed it is not a fair sample—let the average be taken from a range of years, and in the event of the English having the advantage, I question whether the knowledge of the unsuccessful northerner be not deeper and more permanent than the superficial "polish" so quickly imparted to residents in English boarding schools.

E. H. S. disputes, somewhat illogically, the actual difference between the success of the Caledonians and Anglo-Saxons. If it be true that the high percentage of passes in Edinburgh depend on English candidates, why don't the latter not only "help to swell" the London list, but altogether prove their pre-eminence in mental culture, so that failure be unknown? To follow out an opposite argument to Mr. Schacht's it may be the case that if Englishmen ceased to present themselves at the Scottish capital the number of rejections there would be sensibly reduced. Many of those who go to Edinburgh from this side of the border do so on account of the less distance (as probably all those cited by Mr. Schacht as trying their fortune there last December), and some, I know, in order to see the beautiful city. But your correspondent is wrong with regard to the fruitless search for my northern friends in the London pass list. I often see their names published, and know not a few who have passed the ordeal there, hailing even from the "far north," and doubtless there are numbers of others go there too because it is near; for as everyone knows, Scotchmen are scattered all over the provinces, and form no inconsiderable portion of the metropolitan population. Again, a good few of my kinsmen qualify at head-quarters after a course of study at one of the adjacent schools of pharmacy. But why should not the northerners appear for examination in their own centre? Are they afraid of being "plucked" in London? No! I am astonished at one speaking so disparagingly of their abilities who did not figure so high himself at the test. I do not wonder at a person failing to notice the record of registration of natives of Alford, Insch, and other places in the "land of cakes," if his acquaintance with geography be rather rusty.

I cannot see how the subject "dispensing" can be oral any more than written, neither could "analysis," but surely, as in Government science and art examinations, questions could be set, practical work done, and the results committed to paper.

Lastly, I would ask, were the respective merits of candidates not properly "guaged" in the written competition in pharmacy for the Council prize of books to "honour's men?" The system worked satisfactorily enough; then why could not the correct rendering of a medical prescription or the best method of compounding a difficult mixture be transcribed on foolscap as well as a translation of a passage from any of the classics?

March 12, 1878. JAMES B. L. MACKAY.

[*$_*$* We do not think that much light will be thrown upon the problem by a continuation of the argument in the craniological direction, and request that any future correspondence on this subject may be confined within more pertinent limits.—ED. PHARM. JOUR.]

THE MINOR EXAMINATION.

Sir,—I have asked myself the following question so many times without getting a satisfactory answer, I deem it worth while to ask it in your pages.

Is the Minor examination a real test of a man's ability to conduct the business of a chemist and druggist?

My experience tells me that the growing race of chemists will not take the place of many who are passing away, who thoroughly grounded in the practical part of the business, availed themselves of the opportunity to become scientifically qualified.

The tendency of the examinations, and also the conditions of the Bell Scholarships, is to draw pupils from interest in the practical drudgery of the business, by which alone it can be mastered, to more tempting scientific studies, and that from the very commencement of their career.

It has long been a pet idea of mine that something analogous to the examinations for candidates desiring to become officers in the mercantile navy could be applied with great advantage at our own Board. If a candidate fails in seamanship he is sent to sea for twelve months, if in the more scientific part for only three months is he referred to his studies.

It has also been a great question with me whether men who are destined to do all the executive work, and also composing the ruling class of the Society, should be compelled to pay all the expenses of the Society which gives its protection, at least in the matter of title to both classes of chemists, for that is what the pharmaceutical chemist in fact will do in the future under our present system.

I therefore propose the following programme of examinations in lieu of that at present in force:—

Before Apprenticeship—the present Preliminary—fee £2 2*s*. After Apprenticeship, or still better, a year later, examination in practical dispensing, pharmaceutical Latin, physiology, and the galenical portion of the pharmacopœia; fee £2 2*s*. That would qualify for the pass examination (chemist and druggist),—fee £6 6*s*. Should the candidate obtain a sufficient number of marks in the various subjects, that would qualify him without further fee to the third day's examination in practical chemistry, and on passing that would give him the title of pharmaceutical chemist, or enable him at any future time to do so by simply passing what I call the third day of the examination.

This programme would assist the cultivation and secure testing of the candidates' counter work, it would give the stimulus to study that "honours" were supposed to incite, it would place the higher title as the reward of merit, and all would pay the same fees. It would secure on the Board of Examiners an adequate force of matured knowledge, and of scientific acumen not necessarily requiring the wisdom of middle age.

I put this scheme forward as a suggestion to my fellow members whose greater experience may negative my idea, perhaps improve on it. I find no fault, but our motto should always be, "Onward."

GEORGE MEE.

79, Grosvenor Road, Highbury New Park, N.
March 14, 1878.

SALE OF PATENT MEDICINES.

Sir,—I see in the Journal, page 715, the account of a communication received from the Home Secretary, respecting Hunter's Sol. Chloral Hydrat, and the reply thereto.

I believe our Council wish to help us over our business difficulties, instance the "Dental Bill;" but there is a far more serious evil affecting chemists than any dental bill, in a monetary point of view; I refer to the sale of patent medicines by all sorts of little shops. This is being very seriously felt in this and many towns in the north. I saw an account of a meeting the other day where the chairman thought it was not a matter anything could be done in at present. However, I cannot help but differ from him. I think we should agitate and ventilate the subject until something is done to make it compulsory for all patent medicines containing poisons to be sold by registered persons. I have written to several makers of these articles and the general opinion is that the Excise might be induced to grant licences to persons only who have a recommendation from the Registrar of the Pharmaceutical Society; they will not be losers by it in the long run; the spirit licences and others are granted only on like terms. The mischief is, any little shop having a patent medicine licence considers itself justified in selling paregoric sine opio. chlorodyne sine prussic acid, Godfrey's cordial, sp. sweet nitre, 2d. ounce, and all other little articles which make up the chemist's daily returns, and poor people buying these weak preparations get accustomed to giving large doses. The danger is their giving the pure article in the same dose, to the chemist's risk. A case of this kind occurred some time ago: the assistant fortunately cautioned the person about the strength, seeing where the last had been obtained. The woman, either forgetting the caution, or negligently, gave the usual large dose, and the child died. The caution of the assistant probably only saved the chemist from trouble. I hope our Society will try and do something in the matter, and that other more able pens may write upon the subject.

T. KCUB.

March 12, 1878.

Sir,—According to the Journal of the 9th instant, under head "Law and Parliamentary," a communication has been sent direct to the Pharmaceutical Council from the Home Secretary directing attention to the fact that a poison scheduled under the Pharmacy Act had been sold, such poison causing death. The answer of the Pharmaceutical Society —Council or Solicitor not stated—was that, as a patent medicine it was entitled to exemption, and distinctly entitled under the Pharmacy Act, 1868.

How great a space of time longer is such a state of things to last? Up to this date the Pharmaceutical Council have devoted their attention to education, benevolence and æsthetics. Ethics and technics they leave entirely aside as, I presume, being out of their province. The fact published in their Journal, discussed by them prior to an answer being sent on the above published case, has now brought the question of the sale of patent medicines publicly before the attention of the whole body of chemists and druggists, and it will be impossible for the Council to shelve the subject as hitherto done. It must be discussed at their next meeting and made a prominent subject at the yearly meeting.

I do not pretend off hand to find a definite solution of the sale of patent medicines by unqualified persons, but my view of the question is this:—that all chemists in England and Scotland wait upon their local secretaries and request them to forward to the Pharmaceutical Council the expression of their opinion that it is time that immediate steps be taken to compel the proprietors of patent medicines to declare the ingredients of which they are composed and to register the same, and payment of royalty, the said sale being computed by a trade mark, stamped numerically by a legally constituted authority, which would do away with present ad valorem duty. A revision of the scale of duty payable by retailers, say £1 for towns under 20,000, and £2 above that number. The sale of proprietary articles containing poison would be thus vested in the hands of the legally constituted authority, the chemist, whereas at present it is "Tom Tiddler's ground." The highest home governing authority having had the matter so recently before him, immediate legislation may result and the question be definitely settled.

Should the Council be unable to take steps leading to a speedy settlement of the question, I would suggest that chemists should support "the Trades' Protection Society" to the same extent they have previously done the parent society, on the principle that "God helps those who help themselves," leaving to the Square the motto that appears as heading to a short leader of last Journal, "Quos Deus vult perdere, etc."

FRED. B. BINGLEY.

Guildford, March 11, 1878.

Sir,—Licences for the sale of alcoholic beverages are only issued by the excise authorities to those who have previously obtained a certificate from the magistrates that they are of good character, competent, and do not permit of the abuse of the articles in which they deal.

A licence for the sale of patent medicines (5*s.* say) is granted to any one who chooses to ask for it, whether shoemaker, grocer, stationer, or chemist.

This is wrong and is being abused in an unprecedented manner, without saying anything about the temptingly low prices at which they are offered. If the excise authorities could be persuaded only to issue the licences for the sale of patent medicines to chemists qualified by being upon the register of chemists and druggists and pharmaceutical chemists, a wholesome restriction would be placed upon the trade. The chemist would occupy his true position, and he with the public would in consequence be benefited.

This, one would think, could easily be accomplished by a proper representation of the Pharmaceutical Council to the authorities of the Inland Revenue at Somerset House.

K.

February, 1878.

THE WEIGHTS AND MEASURES BILL.

Sir,—In an article on the Weights and Measures Bill, in your Journal of last week, you have, I think, fallen into a slight error. You say, "but there is to be one notable addition, and that is the avoirdupois grain, or the one-seven-thousandth part of the imperial standard pound, the Bill thus practically endorsing the action of the Medical Council in introducing an avoirdupois grain for the purposes of the British Pharmacopœia." Now in Balfour Stewart's 'Elementary Treatise on Heat,' p. 69, we have "and it is enacted 'that the platinum weight deposited in the Exchequer shall be denominated the imperial standard pound, avoirdupois, and that the one-seven-thousandth of it shall be a grain, while 5760 such grains shall denote one pound troy.'"

From this it would seem that the grain is primarily an avoirdupois weight, and that it is so by Act of Parliament and not by any enactment of the Medical Council. I heartily agree with you, however, in the opinion that the proposal to repeal the Act permitting the use of the metric system is a decidedly retrograde movement, and it is one I think which ought to be resisted by those scientific societies which have influence with the Government. Every one, I presume, admits the vast superiority of the French system over ours, and the only objection to its introduction exists in the inconvenience that would result from so radical a change. In this regard we are too apt to forget that other nations have submitted to that very inconvenience, and actually survived it. As a writer on the subject well remarks, "The very idea of a cosmopolitan system carries with it that of national abnegation; and of this the French have set a noble example, they have put aside their ancient toise, their lieu, their pied, and their pouce, to adopt a measure which commends itself to all nations alike by its want of nationality, and the decimal system of measures and weights must, whether we will it or no, prevail against all others."

D. B. DOTT.

24, *Castle Street, Edinburgh,*
March 15, 1878.

CHLORAL, A POISON.

Sir,—Now that chloral and its preparations are included in the Poisons Act schedule, I presume that proprietary articles, avowedly containing chloral, will require to have a "poison" label and vendor's address attached before being sold; also that it will be illegal for unregistered persons to trade in them, for I scarcely think that the Government stamp will protect the patent medicine dealer when the name of the active ingredient is declared.

If such be the case, it would be advisable to caution the "trade," lest anyone unwittingly commit a breach of the law.

Perhaps you will express your idea with regard to this matter.

JAMES B. L. MACKAY.

Newcastle-on-Tyne.

M. P. S.—(1) *Hypnum rusciforme;* (2) *Bryum cæspiticium;* (3) *Hypnum denticulatum;* (4) *Weissia controversa;* (5) *Hypnum riparium;* (6) *Physcomitrium pyriforme.*

T. N. T.—Tuson's 'Veterinary Pharmacopœia,' published by Churchill.

"*In a Groove.*"—We are not acquainted with such a work.

R. Holden.—We do not understand the sentence as quoted, and have been unable to find the original passage.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Hanbury, Mr. Blaikie, Mr. North, Mr. Harvey, "Color," "Oleum."

"THE MONTH."

Notwithstanding the biting winds and the clouds of March dust, flowers are more forward than during the same time last year. In hedges and copses the hazel is almost over and the "palms" or willows, as well as the alder and poplars, are putting forth their catkins, and the delicately tinted blossom of the wood anemone and the handsome yellow flowers of the lent lily are decorating the woods everywhere. The pale primrose, too, is beginning to scatter its nosegays of blossoms beside the clear rivulet and on the shady hedgerow. The dark glossy leaves of the stinking hellebore, surmounted by its racemes of pallid green, purple tipped flowers may now be looked for in thickets, and its near relative the green hellebore is showing its light green flowers here and there in damp orchards and meadows. The marsh marigold, too, with its handsome yellow calyx, often mistaken for a corolla, may now be seen in marshy places. The pretty little moschatel, with its singular head of flowers, may now also be looked for in damp woods. This curious little plant is well worth examination. The flowerhead consists of five flowers, four lateral and one terminal. The four lateral flowers have each a three-parted calyx, a five-parted corolla, and ten stamens in five pairs, each pair being alternate with a corolla lobe, and united into a sort of ring at their base. The terminal flower has a two-parted calyx, a four-parted corolla and eight stamens. The root, or rather rhizome, is white and coralline in appearance, and is furnished with a number of fleshy scales, from the axil of some of which proceed slender underground branches which propagate the plant.

Among medicinal plants in blossom this month may be mentioned the elm, almond, mezereon, spurge laurel, violet, dandelion, coltsfoot, balsam poplar, and lungwort. Those who have the advantage of living near the New Forest or in the Isle of Wight will find the rare narrow-leaved lungwort, *Pulmonaria angustifolia*, in blossom; specimens of this lovely blue flower having recently been received from our local secretary at Ryde. In that favoured island, too, the broom and other plants usually flowering in May, are already in blossom. The common lungwort (*Pulmonaria officinalis*, L.), called also by Gerarde, cowslip of Jerusalem, spotted comfrey, sage of Jerusalem and sage of Bethlehem, possesses demulcent properties, which enabled it to retain for some time a hold upon the popular estimation it is supposed to have obtained in the first place from the resemblance of its spotted leaves to lungs. The scales usually present behind the stamens in so many of the Boraginaceæ are absent in this little plant, and the scorpioid character of the inflorescence is much less evident than in many others of that family. A lichen (*Sticta pulmonacea*) bears also the name of lungwort, and is described and figured in Pereira's 'Materia Medica.'

In the Botanical Gardens at Regent's Park *Styrax officinale* has been in blossom during the past few weeks. The leaves much resemble those of the quince, and are also downy underneath, while the flowers in shape much resemble those of the orange, but the petals are soft and delicate, not thick and succulent as in the orange. The coca (*Erythroxylon Coca*), of which there are two thriving plants in the economic house, are also in full bloom. A variety of *Citrus vulgaris*, with small leaves like those of the myrtle, and a species of pepper from Java, are also in blossom. In the open ground the almond, mezereon, spurge laurel, lungwort, and periwinkle, and the asarabacca (*Asarum europæum*, L.), may be seen in blossom.

On Wednesday last the first flower show of the year was held at these well-known gardens, and the day being remarkably fine an unusually large number of visitors were present. Usually the corridor only is used, but this year the exhibitors occupied the end and side of the large conservatory also. The show of "Spring Flowers" included orchids and other stove and greenhouse plants, deutzias, bouvardias, azaleas, and cyclamens, hyacinths, tulips and lilies of the valley. Some of the roses exhibited were unusually fine plants for this time of the year, one of the pot roses being of good form and about two feet in diameter by nearly three feet high. A new cyclamen attracted especial attention by its magnificent colour, which is easier to remember than to describe. The large conservatory itself is now quite gay with azaleas, rhododendrons, red and white camellias, acacias and the graceful dielytra, besides innumerable hyacinths and tulips, so that the whole effect of the show was excellent. The next show of spring flowers takes place on April 14.

At Kew the *Drimys Winteri* has been sparingly in blossom and one or two varieties of the orange and of tobacco are still in flower, while in the orchid house a species of Sarracenia (*S. flava*) is flowering freely. In the open ground *Jeffersonia diphylla*, Pers., is full of buds. This plant is known in the United States as rheumatism root, or twinleaf, but is not official in the American Pharmacopœia. Its properties, etc., have been fully described in this Journal by Professor Bentley.* Like most of the Berberidaceous plants, the parts of the flower are four in number and the anthers open by valves. The flower much resembles that of *Sanguinaria canadensis* in appearance, but the leaf is very different, consisting of two kidney-shaped leaflets, whence the name of the plant, "twinleaf." *Mandragora vernalis* and *Hyoscyamus orientalis* are also in blossom and afford to botanical students an opportunity of seeing plants of the natural order Atropaceæ at a time of year when it is very difficult to meet with them.

Through the kindness of Professor Balfour we are enabled to state that at Edinburgh Botanical Gardens the orange, twinleaf, and *Coptis trifoliata*, or gold thread, as it is called in North America, are now in flower, also *Daphne Mezereum*, *Kalmia latifolia* and *Mandragora vernalis*.

'Medicinal Plants' for this month contains figures of *Juniperus Sabina*, *Garcinia Hanburii*, *Cinnamomum Camphora*, *Indigofera tinctoria*, *Guaiacum officinale*, *Sassafras officinale*, and *Amomum Melagueta*. The figure of savin is taken apparently from one of the smaller lateral shoots of a branch, so that all the leaves are closely imbricated, and thus the drawing presents a very different appearance from the more elongated twigs which are generally met with in commerce, and in which the leaves are longer and more spreading. It is a pity that a small piece of a twig with spreading leaves was not figured side by side with the other. The figure of the camphor plant is one of the worst that we have seen. The grotesque distorted appearance of the leaves by no means represents the habit of the plant as we have seen it growing in Kew Gardens, where the figure is said to have been made. The peculiar twist which the artist seems to delight in giving to the leaves is

* Series 2, vol. iv, p. 104.

noticeable also in the leaves of the gamboge plant; but with these exceptions the number is quite equal to the average both in plates and matter.

The preparations for war made by this country are not altogether without their effect upon the domain of pharmacy. Such large supplies of quinine, and citrate of iron and quinine have been laid in by Government as temporarily to cause a considerable and sudden rise in the price of those drugs. Singularly enough, however, large quantities of otto of rose have recently been offered, probably with the view of obtaining high prices. Coca leaves, although often appearing in the lists, do not appear to be in much demand, while of jaborandi there is but little offered. Coto bark has, however, figured more frequently of late in the English market, but is believed to be chiefly exported to Germany again.

Thymol seems to increase in favour, and is rapidly rising to the rank of a valuable disinfectant. The *Medical Times and Gazette* and the *Doctor* have each a paper on the subject, and the former gives a formula for a gauze dressing for wounds, as follows:—Bleached gauze, 1000 parts; spermaceti, 500; resin, 50; thymol, 16 parts. The gauze so made is extremely soft and pliant, and can be accurately adapted to a wound, and according to Dr. Ranke sucks up the blood and secretions of the wound like a sponge. When kept in stock it should be enclosed in a tin case or in parchment paper. Dr. Ranke's experiments show that although thymol is twenty times as expensive as carbolic acid, yet the difference in price is more than compensated for by the extremely small amount of secretion induced by thymol, and the consequent reduction in the number of bandages necessary. He further points out that the redness, vesication and eczema produced by carbolic acid dressings have entirely disappeared when thymol has been substituted.

Mr. Squire has hit upon the excellent idea of adding thymol to adhesive plaster in the proportion of one part to one thousand, so as to render it more antiseptic and less irritating. Dr. Stone, of Westminster Hospital, has found thymol of use in chorea in doses of two to five grains thrice daily.

Dr. F. T. Bond, who is interested in terebene, refers the antiseptic properties of that preparation to the presence of cymene, which he considers to be an isomer of thymene, and "the essential basis of thymol."

The telephone has recently been turned to account for medical purposes. Mr. J. Blyth, secretary to the Society of Engineers of Edinburgh and Leith, has adapted it so that by its means the hearing power of one or both ears can be accurately measured.

From a paper that recently appeared in the *Gazette Hebdomadaire* we learn that wood tar creasote, which is sometimes used in phthisis, is difficult to obtain pure in commerce, and that Messrs. Bouchard and Gimbert, who have been investigating it, give the following as the best tests for its purity:—It boils at 219° C., forms crystallizable salts with potash, but not with soda, gives no precipitate with collodion, and a green and then brown colour to an aqueous solution of perchloride of iron. They recommend the neutral creasotate of potassium as the best form for therapeutical purposes. To make this salt the beechwood creasote is dissolved in half its volume of ether, and mixed with a concentrated alcoholic solution of caustic potash.

Dr. Fothergill, writing from London to the *Philadelphia Medical Times*, recommends strychnia in combination with carbonate of ammonia and tincture of squills, in bronchitis, when the stage of free secretion of phlegm is reached, and also in many cases of difficulty of breathing. It must be supposed that the quantity of strychnia used is not sufficient to be precipitated by the alkali, or the mixture would be a dangerous one.

A new crystalline substance, called phyllic acid by its discoverer, has been discovered in several rosaceous plants, as well as in jaborandi, the fig, etc. It is obtained by treating with ether an alcoholic extract of the leaves, from which resinous and waxy matters have previously been removed by deposition.

Caffeine, in the form of hydrobromate or citrate, has recently been brought into notice as a diuretic by M. Gubler, who states that it acts more powerfully and promptly than digitalis.

Another diuretic which savours somewhat of ancient pharmacy, or of Chinese materia medica, has lately come into notice, and is being advertised in some of the American journals. This is the brown cockroach, *Blatta orientalis*. The dose given is from fifteen grains to half a drachm, in powder or infusion, three or four times a day. It is used in dropsy, and is said to increase both the secretion of urine and of perspiration.

Dr. Galezowski recommends the use of neutral sulphate or nitrate of pilocarpine in preference to eserine in the proportion of one-twelfth of a grain to an ounce of laurel water, which he says possesses the following advantages. When applied to the eye it does not cause the acute pain and nausea sometimes caused by the use of eserine, while the laurel water prevents the formation of fungi and the consequent inertness of the solution.

The application of carbonate of soda to burns and scalds is still under discussion in the medical papers. Dr. Macdonald of Glasgow, who uses ordinary washing soda, in the proportion of 1 lb. to a wash-hand basin of water, finds that the application causes intense pain for from a few minutes to half-an-hour, but that after that time there is no pain, and healing takes place rapidly, so much so, that in some cases after undergoing agonizing pain the patients had nothing to show next day and were looked on as impostors.

Many as are the substitutes that have been proposed for quinine, yet another has recently come under notice, namely the root of *Cassia occidentalis*, which is used in Angola for the treatment of fevers. The plant is known under the name of "Fedegozo," and a decoction is made from the roots which are exceedingly bitter. The seeds after being roasted and ground are used either with coffee or as a substitute for that beverage. In Mauritius, the plant has become naturalized, and there the seeds are also used for a similar purpose to that just mentioned, and are moreover said to be useful in cases of asthma. The plant is also found in both the East and West Indies. Other plants used by the natives in Angola in the treatment of fever are *Vernonia senegalensis*, known as the "Matuto," the leaves of which are very bitter, and are used in infusion; *Chenopodium ambrosioides*, or "Herva Santa Maria," and the "Sangue Sangue," apparently a species of *Cymbopogon*. Mr. Monteiro says—"A common method they have of curing fever is to induce strong perspiration by squatting over an earthen pot (just removed from the fire), sunk in a hole in the ground, in which "Herva Santa Maria" and 'Sangue Sangue' have been boiled. The patient is well covered over, and the aromatic vapour-bath soon produces its desired effect. I have seen blacks cured of severe attacks of fever with one or two applications of this simple remedy." The *Chenopodium ambrosioides* is found in many parts of the tropics, and is generally known as Mexican tea. Its tonic and antispasmodic properties are known in most countries where it grows. In Angola it is said that "in almost every complaint the natives first apply this plant as a remedy. For internal pains of every kind it is taken in decoction, or the crushed plant rubbed over the seat of the pain. Poultices of the fresh plant are employed for swellings, bruises, or blows, and when the back aches from carrying heavy loads, fresh leaves are rubbed on the spine and a handful of the crushed plant is placed between the skin and the waistcoat. For headache the crushed plant is rubbed over the head and plugs of the leaves pushed up the nostrils."

Substitutes for quinine appear to be numberless. An American contemporary quotes a statement from the *Anglo-Brazilian Times* to the effect that a large quantity of the bark of *Cinchona ferruginea*, Mart., has been brought down from Minas Geraes to Rio for extracting from it an acid resin which exists in it in combination to the extent of about 5 per cent. This resin is known in Brazil as Vieirina, or Vieirino, and is said to have been successfully employed instead of quinine as a tonic or febrifuge.

Mustard and cantharides also, may according to Dr. Coutivier, in *L'Union Médicale*, find a rival in extract of pimento, which is said to manifest a rapid and satisfactory revulsive action when applied to the skin. It is conveniently prepared for application by working it into a plastic mass and spreading it on squares of paper; these plasters will then adhere to the skin without warming, although it is as well to use a bandage when applying them to parts subject to much movement.

A new source of musk, or a good substitute for it, Dr. Bertherand, of Algiers, believes he has discovered in the droppings of a small antelope (*A. dorcas*, L.), common in the Sahara. The dried excrement is said to yield to rectified spirit 7 per cent. of a mixture of a resinous principle analogous to musk, benzoic acid, and biliary acid and colouring matters. The resinous principle may also be extracted with carbon bisulphide, but this, as might be expected, affects its odour. The portion soluble in water (3·1 per cent.) contains ammonia and a large proportion of sodium chloride, and there is 26·5 per cent. of insoluble mineral substance, principally calcium phosphate.

Among the "new remedies" which have been recommended lately, the following appear to have arrived at the dignity of being quoted in the price lists; though for how long remains yet to be proved. The quotation is from the spring circular of Herr Merck, of Darmstadt. Acidum cressotinicum; Acidum cressylicum; Acidum laricinicum cryst.; Acidum hydrobromicum; Carboneum monochloratum; Calcium chlorhydrophosphoricum sicc. and liq.; Ferrum citric. effervescens; Gelsemin hydrochloratum and sulphuricum; Hydrargyrum peptonicum fluidum; Lithium valerianicum; Lithium salicylicum; Magnesium ergotinicum; Natrium borosalicylicum; Natrium copaivicum; Natrium cressotinicum; Natrium sylvinicum; Neurin; Zincum boracicum; Zincum oleinicum.

On the above mentioned preparations it may be remarked that the chlorhydrophosphate of lime, in which the phosphate of lime is rendered soluble by hydrochloric acid, was included among the new remedies dealt with recently by the Paris Society, and that a formula for its preparation will be found on p. 1041 of the last volume; the hydrochlorate and sulphate of gelseminine are both said to be freely soluble in water, whilst the uncombined alkaloid is only difficultly soluble; the boro-salicylate of sodium would appear to represent the compound formed when borax is added to increase the solubility of salicylic acid in water, and should at least suggest a doubt as to whether such an addition is justifiable; whilst the salicylate of lithium has been suggested as reducing the difficulty to a minimum, in consequence of the small proportion of alkali in combination.

Salicylate of soda has now been for some time a favourite with the profession, it is readily soluble, and as usually prescribed presents no difficulties, but of late there has been introduced a salicylate of iron which is very insoluble, and a mixture with this salt in it cannot claim to be considered as elegant pharmacy.

It is worth mentioning also that Herr Merck calls attention to certain lamelliform so-called salts of eserine,—sulphate, hydrobromate and hydrochlorate,—that are just now to be met with, which he alleges to be simply the aqueous extract prepared in lamellæ, containing only traces of the alkaloid and no acid.

The question of the antagonistic action of morphia and atropine is being gradually cleared up by constant contributions of facts and cases. Dr. Mackay of Brighton shows that atropine probably circulates much more quickly through the system than morphia. While Dr. Harley points out that one grain of sulphate of atropine injected hypodermically will usually prove fatal whether opium has been previously administered or not, Dr. Fothergill records a case of poisoning by an amount of laudanum equal to twelve grains of opium, which was cured by the subcutaneous injection of the supposed fatal quantity of sulphate of atropine. Another correspondent in the *Lancet* shows that one-fiftieth of a grain of atropine may, where there is idiosyncrasy, be an exceedingly dangerous dose. Thus it appears that in calculating upon the antagonistic action of the two drugs several circumstances must be taken into consideration.

Dr. Farquharson's recent remarks on materia medica examinations in the *British Medical Journal*, are not altogether without interest to those engaged in pharmacy. He considers that the present manner of teaching that subject in medical schools perpetuates the vices of "grinding" in their worst form, and goes on to say that the student of medicine should not be expected to know anything about the adulteration of drugs, as it concerns almost entirely our wholesale druggists.

It may be that the student of medicine has too many subjects to learn at the hospitals, and doubtless it would be far better if such subjects as materia medica, botany, and chemistry formed part of a university education, to be learnt before walking the hospitals; but surely so long as medical men prepare and dispense their own medicines, it is just as much incumbent upon them as upon the pharmacist to know whether their scammony and jalap, their quinine, ipecacuanha and opium, etc., are of good or bad quality, and whether they are adulterated or not. Nor does the subject of adulteration of drugs concern almost entirely our wholesale druggists. It is the retail dealer who is more deeply concerned, and who is liable to penalties for adulteration. The remark that after the necessary examinations "the qualified man restores the elasticity of his brain by throwing much of its tightly packed cargo overboard," is undoubtedly true, but this only tends to show that the examinations are to blame which necessitate the study of such useless learning. This defect is to be seen not in medical schools alone, for the non-medical students who are liable to be asked the ingredient of any preparation in the Pharmacopœia feel bound to "cram" the whole of the Pharmacopœia into their brain until the examination is over, and then forget it as speedily as possible, and use the Pharmacopœia itself when necessary. If, however, Dr. Farquharson's remarks lead to the adoption of measures for altering some of the anomalies which exist in medical schools, or to the removal of some subjects now taught in hospitals to the universities, great good will have been done.

Dr. Churston, of Leeds, writing on the same subject, points out that some of the subjects taught in the hospitals ought to form a portion of the matriculation examination, while Mr. Jessop, of Clifton, calls attention to the necessity of endeavouring to make the student more efficient by practical work.

That a deficiency of material for such work in materia medica exists in some of our hospitals will be evident enough to any one who chooses to visit the museum of the Pharmaceutical Society and see in the attendance book the number of names of medical students who avail themselves of the opportunity of studying practically the characters of drugs.

As evidence of the necessity for such practical knowledge, Mr. Jessop alludes to scores of incompatible prescriptions which he has seen from hospital experts, and mentions two which have recently come under his notice, one of a mixture of dilute nitro-muriatic acid and prussic acid, and the other an acid solution of quinine prescribed with Fowler's solution. He adds, with reason, that "if the youngster does not know the druggists' work he certainly will never get credit for his prescriptions, and if he were to stand (invisible) behind the counter he would hear what would make his ears tingle." It might be added that on account of this want of practical knowledge on the part of medical men, and when the address of the prescriber is unknown, or there is not time to communicate with him, a burden of responsibility is frequently thrown upon the dispensing chemist which the dispenser ought not to be required to bear. For instance, when iodide of potassium and nitrous ether are ordered together (as is not unfrequently seen in a prescription) in a small bottle of medicine, either the patient must be warned against taking the mixture when it becomes dark coloured, thus implying incapacity on the part of the prescriber, or must run the risk of having the blame of bad dispensing cast upon himself, as is sometimes ungenerously or ignorantly done by the prescriber in such cases.

Lecoq de Boisbaudran and E. Jungfleisch have published* an exhaustive paper on the extraction of gallium from the ores in which it is found associated with indium. The blende of Bensberg (the richest gallium ore known) is pulverized, and then roasted in a Perret furnace, by which treatment the greater part of the indium is volatilized. The residue is treated with sulphuric acid in quantity sufficient to dissolve almost all the zinc, and there is thus obtained a residue, which is treated with excess of sulphuric acid. The per-salts of iron present are then reduced by means of metallic zinc, and the filtrate fractionally precipitated with carbonate of sodium; the precipitates are re-dissolved in sulphuric acid, and the reduction with zinc and the fractional precipitation repeated, the latter operation being in both cases watched with the spectroscope. The precipitate containing the gallium concentrated in a small bulk is re-dissolved in acid, and the excess of the latter reagent removed by evaporation, after which it is boiled with much water. The filtrate separated from the sediment containing titanic acid, which forms, is treated with sulphuretted hydrogen, then mixed with acetate of ammonium, and again treated with sulphuretted hydrogen, which throws down the galliferous sulphide of zinc free from alumina. Again the precipitate is dissolved in sulphuric acid, and the solution fractionally precipitated with carbonate of sodium, which operation, guided as it is by spectral examination, entirely removes the zinc. By once more dissolving in the exactly necessary amount of sulphuric acid, and treating with sulphuretted hydrogen, cadmium, lead, indium, and zinc are removed, and the filtrate is then largely diluted with water and boiled. The bulky sub-salt of gallium which separates at this temperature is treated with potash, which leaves iron, indium, etc., undissolved, and the alkaline liquor when treated with sulphuretted hydrogen, and subsequently with sulphuric acid to slight acidity, yields a deposit consisting mainly of sulphide of indium. The slightly acid liquid is then boiled with much water, and the deposit of sub-salt of gallium thus obtained is dissolved in potash, and the solution subjected to electrolysis, by which means a metallic deposit of gallium is obtained.

In an interesting paper, by Fr. Mohr,† it is shown that carbonic anhydride has the power of effecting a number of decompositions hitherto but imperfectly known. For instance, when passed through solutions of the acetates of barium, zinc, and lead, these salts are all decomposed to some extent, and simultaneously the carbonates of the above enumerated metals are precipitated. Mohr further shows that solutions of chromate of potassium, borax, sodium phosphate, microcosmic salt, acetate of sodium, and the tartrates of sodium and potassium, have all the power of absorbing carbonic anhydride, in some instances at least, with decomposition.

H. Klinger‡ has obtained trimethylsulphiodide, crystallizing from alcohol in colourless prisms, by heating methyliodide with sulphur in sealed tubes at 160° to 190°. He has also obtained a platinochloride compound of the formula $((CH_3)_3SCl)PtCl_4$, which crystallizes in cubes and octahedra.

Since the last "Month," Claude Bernard the well-known French physiologist has died. Among his

* *Comptes Rendus*, No. 7, February, 1878.
† Liebig's 'Annalen,' clxxxv, 286—295.
‡ *Deut. Chem. Ges. Ber.*, x, 1880—1881.

most famous researches were those on the pancreas and liver, and the production of artificial diabetes by puncture of the fourth ventricle. On more than one occasion his work in these directions has been noticed in the columns of this Journal, and particularly so, his studies upon glycosuria and the presence of sugar in the blood, a subject, it will be remembered, upon which Pavy holds somewhat different opinions. Then again, Bernard made a fame for himself by his continued studies of the action of various poisons, and among them curare. Among his varied contributions to knowledge was one on the prevention of pitting in small-pox. During an epidemic of small-pox in 1870, Bernard had occasion in a number of cases to puncture each somewhat developed pustule with a needle, washing with tepid water being afterwards resorted to, and he found when this treatment was repeated several times, so as to keep the small wounds open and to allow of the ready removal of the variolus matter, that most satisfactory results were attained in preventing what is usually termed "pitting."

In a note communicated by Pasteur to the Academy of Medicine, regarding septicæmia, he points out that the vibrios characteristic of this disease cannot sustain the presence of oxygen, but they can live *in vacuo* and in carbonic anhydride and be under the circumstances transformed into fully developed germs which can then resist the otherwise destructive action of the atmospheric oxygen.

G. F. Dowdeswell in a communication to a recent number of *Nature*, describes experiments in which water from different sources was allowed to stand at perfect rest for a given time ; on then examining the lowest stratum of liquid in the cylinders, he detected the presence of organisms in large numbers. This fact is interesting only as a confirmation of Pasteur's statement to the same effect, and it will be perceived that the method of investigation is parallel to that employed by Tyndall in his experiments upon the motes the vibration of which in the atmosphere gives visibility to a ray of light in its passage through a darkened chamber.

P. Fürbünger, in some observations on urine, concludes that oxalic acid is a normal and perhaps constant constituent of this liquid, the quantity excreted daily being under 20 mgrm. Part of this oxalic acid seems to exist in the forms of oxalate of calcium kept in solution by the solvent agency of phosphate of sodium.

The *Medical Record* has recently called attention to what it terms, "Sensational Therapeutics," and its remarks are indeed well timed. The special matter to which our contemporary refers, is a statement,* according to which, Dr. Liron has successfully treated three cases of acute articular rheumatism by the subcutaneous injection of a few drops of cold water in the vicinity of the affected part. It is more than foolish even to suppose that such a treatment could have any virtue for the relief of a disease which evidently depends more or less upon a morbid chemical condition of the blood; and yet such assertions as that above referred to are by no means uncommon, even in leading scientific journals. The truth is that the entire age is sensational; men pine for premature fame—for mere empty word-praise, and the more extraordinary their methods of investigation, the more illogical and impossible their conclusions and their results, the greater is the public appreciation which is too often awarded them.

It is the fashion now-a-days to inject all sorts of preparations subcutaneously with the mere object of recording the observed results, and journals on therapeutics are filled with the records of such proceedings. But this is not science. To take half a dozen different substances having no characters in common and no particular chemical relationship, and to inject these into the bodies of animals is likely to prove so much mere waste of time. It is a different thing when parallel experiments are made with a series of substances having definite and determined chemical relations. Here there is some little better hope of increasing the sum of knowledge, for from past experiences there seems to be some sort of connection—indefinite as it is—between the chemical constitution and physiological action of certain principles. But even in such case the act of subcutaneous or other mode of injection interferes with the normal state of the body, and to a large extent the mere effect of the operation cannot be distinguished from the effects of the agent employed.

In imitation of other sensations got up by certain analysts and to which the English public are now well inured, certain continental chemists have caused a scare by announcing the detection of arsenic in a number of samples of beer. If present, its amount is matter for interesting speculation, as it must have been derived from that small quantity present in the pyrites used in making sulphuric acid for converting starch into glucose. Its amount must therefore be something considerably less than that of the copper present in preserved peas, but no doubt there are not wanting in the ranks of scientific men those who are prepared to swear that the presence of infinitesimal traces of arsenic is sufficient to promote the death of persons who persist in drinking this beverage. While writing of beer it may be mentioned that the German Society for the Encouragement of Industry has offered a prize of £125 for the best method of detecting glycerine in beer, it being not an uncommon apprehension in Germany that this fluid is sometimes adulterated with the substance in question.

M. C. Tellier has suggested the use of trimethylamine as a frigorific agent possessing many advantages over ammonia, ether, etc. It is obtained from the residues of the beet root employed in the manufacture of sugar, and is particularly adapted for use in ice-making machines, owing to the slight pressure required for its condensation. A disadvantage attending its use, however, is its disagreeable odour, but this should not prove a serious obstacle to its employment if it can really be obtained in sufficient quantity, and further if, what is more important, it possesses the absorption-capacity for heat which is attributed to it.

Writing to the *Chemical News* of the 8th inst., Lieutenent Bertram A. Muirhead states that safety matches, which, according to advertisement, ignite only on the box, will strike freely on common coal, and he suggests that the reason of this is that the combustible carbon of the coal takes the place of and acts like the amorphous phosphorus of the rubber. It is very much to be doubted, however, whether as the writer suggests, this will lead to the manufacture of a safety match without the employment of phosphorus.

The fact that safety matches can be ignited by

* *Gaz. des Hopitaux*, No. 92, 1877.

friction on a surface of coal has been confirmed by another correspondent of the same journal, and he points out that certain wooden surfaces are also equally efficacious. In such cases the ignition is most probably due to the heat generated by mere friction.

A serious outbreak of diphtheria is reported by Dr. Tripe to have occurred at Upper Clapton, and from his inspection it is evident that the cause of the disease was the access of sewer gas into the water supply of the house, thus making it probable that the continued epidemics of this nature are to be attributed to defective drainage.

The medical world is again agitated by another case of a fasting girl residing at Borth, and of course as in all other cases of this kind she is alleged to have outgrown her clothes and increased in body-weight, notwithstanding that for some time she has been confined to her bed and has eaten nothing. The fact that there are many people and even medical men who place credence in such assertions is as surprising as the mania of Don Quixote and as pitiable as the fanatical views of religious zealots.

In an article on the practice of smoking, the *Daily Telegraph* of a recent date pointed out that in tobacco there is a narcotic and sedative more potent than any known to the Pharmacopœia, if this be true and statistics are worth anything, smokers at least are well narcotized, for in 1841 the quantity of tobacco cleared for consumption amounted to about fourteen ounces for each head of the population; in 1851, the quantity increased to seventeen ounces; in 1861 it had reached nineteen and half ounces; in 1871 twenty-one and a half ounces were consumed, while in 1876, the consumption amounted to nearly one pound and a half for each head of the population.

Every object in creation is said to have its mission; that of the couch grass (*Triticum repens*) has hitherto been pretty generally supposed to be one of plaguing the farmer. A French pharmacist, M. Planchud, has, however, recently suggested for it the nobler mission of a food material, and this in more forms than one. This gentleman has obtained from 100 grams of the dried plant, 3 grams of crystallizable sugar, 4 grams of glucose, 13·9 grams of starch, albumenoid matter represented by 1·45 grams of nitrogen, and 3·25 grams of ash, consisting of silica, lime, magnesia, potash, soda, ferric oxide, phosphoric acid (10·90 per cent.), and sulphuric acid. M. Planchud points out that the proportion of nitrogen in couch grass is therefore as large or larger than in rye, potatoes, beets, hay, or clover, and he suggests it as a cheap source of nourishing fodder and as also capable, mixed with wheat flour, of yielding a bread which though not very white has a more pleasant taste than rye bread. This is not quite new, as the roots are used to some extent in Italy as fodder, and have been used for bread-making in times of scarcity; the grass, however, is not generally deemed to be very nutritious. But M. Planchud further suggests that considering the small value of the material the starch (13·9 per cent.) might be profitably extracted industrially, or by suitable treatment converted into sugar, and, with the sugar existing ready formed, fermented, and used as a source of alcohol. Should it be found profitable to carry out this utilization of waste, it might create a future for many sandy tracts at present lying apparently unreclaimable.

To revert to affairs more specially pharmaceutical, considerable progress is being made in the preparation of materials to be available in the revision of the United States' Pharmacopœia, the next edition of which promises to create some stir in the pharmaceutical world. The committees appointed by the American Pharmaceutical Association and the Philadelphia College of Pharmacy, working in conjunction with two medical committees, have already come to decisions upon several points, and are apparently fairly in accord. The Philadelphia committee is of opinion that the present pharmacopœia should be modified so as to include only one alphabetical arrangement, to have the description of the physical properties of drugs and chemicals extended, and the formulæ for the manufacture of chemicals omitted, except where different results are produced by different processes, descriptions of the substances with tests of identity and purity being substituted. This committee further agreed to recommend the abandonment of measures of capacity, and the substitution of parts by weight. It also favours the introduction of powdered extracts, and that the fluid extracts shall represent grain for grain. At a joint meeting of the committees a resolution was passed that weights and measures ought not to be introduced into the formularies except when required for convenience of dose, and that then the weights should be in grains, with the equivalent metric weight appended between brackets.

It has been remarked in a previous note on the "Dispensing Memoranda," how frequently difficulties occur in dispensing prescriptions through contamination of one or more ingredients, imperfect manipulation in the manufacture of the preparations with which the prescriptions are compounded, or deficiency in strength of the product. In no other way can the result obtained by a correspondent in dispensing the mixture No. 63 be accounted for. Carefully dispensed, and with B.P. preparations, it is the colour of pale sherry, perfectly clear and without sediment, but apparently in the writer's hands it has produced in one instance a "turbid mixture," and in the other one that "turned black as ink." The presence of tannin must be looked for to account for this latter appearance. An imperfectly washed measure will sometimes occasion such a result, which may be designated careless manipulation, or it may arise through some error in the manufacture of one of the preparations. The cause of this change of colour should, if possible, be traced out.

It is an axiom in dispensing that there should be no substitution; when the writer of a prescription orders a preparation of the British Pharmacopœia, his instructions should be strictly carried out. In the instance No. 64 there is not the shadow of a reason for deviation from the strict letter of the law. If the pil. hyd. and the extract were each of the proper consistence, there could have been no difficulty with these pills and the unpardonable crime of substitution would never have entered the mind of the inquirer.

Opinions have for many years been much divided as to the value of the term "gtt." in prescriptions. The question 64* is not by any means new; every now and then it crops up in the Journal, and settles down again into its former position of doubt and uncertainty. At the present time opinions vary as much as ever, and as a necessary consequence there is a divergence of practice, the real question at issue is not, Which is the more accurate, dropping, or measuring? but when "gtt." occurs in a prescription should the ingredient to which it refers be dropped from the bottle, or measured by the minim measure?

It will no doubt be urged that drops vary so much, depending on the density of the liquid, the shape of the lip, the quantity of fluid in the bottle, and also whether the stopper be kept partly in the bottle whilst dropping or be entirely removed, that for accuracy and even in some instances safety the minim measure should in every case be used. But this is begging the question, and may be met by the remark that there is no evidence to show that the writer of the prescription is not as well aware of the difference between a drop and a minim as those are who have taken the trouble to publish tables showing these differences, and that he prescribes his drops accordingly.

In 1842 Mr. Allsop introduced a minim meter, and at the same time remarked on the variable character of drops as compared with minims. Mr. Barnard Proctor shortly afterwards followed in an article commencing with the question, "What is meant by 'gtt.'"? and accompanied it by a table giving the results of many experiments to show the difference between drops and minims. He also suggested the more general use of the minim measure, but he left the real point at issue just where he found it.

What is a drop? "A small portion of any fluid in a spherical form, which falls at once from any body." From a very early period "gtt." has occupied a place in prescriptions, but although the minim as a measure of capacity was introduced into the Pharmacopœia in the early part of the present century, as the smallest liquid measure, still the introduction of the minim does not supersede its more ancient rival, the drop. Guttæ cannot be rendered minims any more than minims can be rendered guttæ; at the same time it must be admitted as most desirable that writers of prescriptions should discontinue the use of the term "guttæ," uncertain and unsafe as it is proved to be, and substitute for it the more definite "minim;" but the change, however much to be wished, must be initiated by the writer of the prescription and not by the dispenser.

The observations in an article in the *Pharmacist* of 1874 on this subject are very much to the point. "The remedy for this evil rests not with the pharmacist but with the physician, whose duty it is, and whose interest it will soon be, to protect him from it." So long, therefore, as the medical profession in their prescriptions make use of the term "gtt.," so long should a dispenser drop that fluid, of which it stands as the symbol of quantity, or an equivalent of that ingredient, determined by previous experiment, by measure, and the responsibility must rest on the the writer of the prescription.

In the present advanced state of medical knowledge and the present position of medical science, it is an anomaly to find "nostrums" of unknown composition take the place of those remedial agents of known and definite composition of which the Pharmacopœia is the depository; but whilst such is the case that preparation generally accepted as the original should be used; in no case can a formula, "represented as the composition of the popular medicine," be accepted by the dispenser of the prescription. Report is no authority.

It is sometimes found that a substance, not of a simple character, as an excipient should be, and foreign to the prescription, has the peculiar property of assisting the formation of a pill mass. It is a fact, and may be worth recording, but at the same time not admissible in a prescription. An instance of this kind occurs in No. 65, where quinine is directed to be made into pills; tartaric acid should not be employed, confection of hips will answer the purpose, but as this excipient colours the pills glycerine and tragacanth is to be preferred.

A medicine is occasionally sent out without any appearance of that change which subsequently takes place. This is exemplified in No. 66; the mixture when prepared show a slight opacity, due to the resin of the tr. nuc. vom., but in twelve hours or so a flocculent matter separates, and subsequently rises to the suface of the mixture, the amount of flocculent matter, which is the resinous portion of the nux vomica in a finely divided state, will depend very much on the care taken in making the tincture. From the result of some inquiries on this subject by Dr. Siebold, embodied in a paper read at the Glasgow Conference, it would appear that much of the tincture of nux vomica examined by him was very deficient in strength. It is quite possible that the writer of the prescription, who may have seen such a mixture when just dispensed, would consider when he saw a flocculent separation at the house of the patient that it had not been properly prepared. The separation of this resinous matter is unavoidable, and would rather indicate that the tincture of nux vomica was of B.P. standard. At the same time such a result suggests a habit of observation, in order to furnish, when called upon, a satisfactory explanation.

Quinine mxtures, such as that of No. 67, have been already commented on. As a rule there is a separation of the quinine, and the same treatment as previously recommended, the addition of a little mucilage, will generally obviate it.

Iodide of iron may be made into pills as in No. 68, by a little glycerine and tragacanth, an excipient very suitable in this case, and the pills may be rolled out without difficulty. As iodide of iron is seldom met with in a satisfactory condition, a better result may perhaps be obtained by proceeding as in pil. ferri iodid., B.P., calculating the proper proportion of iodine and iron to yield the required amount of iodide of iron.

Some pharmaceutical preparations are, through the joint action of light and air, constantly undergoing change, and sp. æther. nit. is one of them. Whatever may be its condition when first drawn over, it very soon becomes strongly acid. In dispensing a prescription with such a preparation, care must be taken that no essential ingredient is decomposed by its action. In No. 69 there is pot. iodid., which would be at once decomposed in contact with acid sp. æther. nit. It is necessary therefore to neutralize the acid present by the addition of an alkali, and probably pot. bicarb. may be most suitable for this purpose. Dissolve the pot. iodid. in a little water, add the remainder of the water to the sp. æther nit., neutralize and mix with the mucilage. In preparing this mixture care must be taken to neutralize the sp. æther. nit., or iodine will be liberated by its contact with pot. iod., and water must be added to the sp. æth. nit. before its addition to the mucilage, or the gum will be precipitated.

The method of procedure in No. 70 will be the same is indicated in other quinine mixtures, where there is a separation of the quinine. The hop contains a good deal of tannin, and the separated portion is most probably tannate of quinine.

It is an important point in making ointments to use a good large mortar. In such an instance as No. 71, the hyd. am. chlor. should be rubbed into a very smooth condition with the glycerine, and the ung. cetacei being subsequently added will make an unexceptionable ointment. The result is not so satisfactory when the ointment is made on a slab, and there is an objection to heating the ointment, since it promotes oxidation and is quite unnecessary.

Sometimes a trifling addition to a prescription requires a change in the method of procedure in dispensing it. No. 71 is an illustration of this; the formula differs from that just commented on by the addition of aq. rosæ to the glycerine. In this instance the plan of melting to a creamy consistence may be adopted, but certainly not the addition of the oxide of zinc in powder. The zinc should be rubbed in a mortar with the glycerine and rose water till quite smooth, and the ung. cetacei being added, the whole should be stirred till cold. There is, however, even here no necessity for melting the ointment; the same plan may be adopted as in the preceding case, namely, the use of a good-sized mortar.

Prescriptions are frequently met with where an essential oil is one of the ingredients, with "q. s." attached to it; but the oil sometimes interferes with the formation of a good mass. Five minims of ol. carui would be, in No. 72, a very good proportion. In this instance a small quantity of glycerine and tragacanth excipient will make a firm mass, easily rolled into pills that will not lose their shape by keeping. When glycerine and tragacanth excipient is used, the mass should be well-kneaded, or more of the excipient will be employed than is necessary, and the subsequent mass may be softer than is desired. The addition of ext. gent., as recommended by a correspondent, is not admissible.

Some difficulties in dispensing are purely imaginary, in as No. 73. It seems scarcely possible to point out any method of procedure, which consisted in putting the ingredients together, that would not result in a satisfactory mixture. The ferri carb. and pulv. rhei, should be rubbed together in a mortar with the sp. chlorof. and water previously mixed. Of course a label to shake the bottle should accompany the mixture.

When a prescription is placed before a dispenser, the vehicle of which has evidently been left out, and he is unable to communicate with the writer he should calculate the dose of each ingredient, taking care that he keeps them all within Pharmacopœia limits. Such a case as this occurs in 74. Probably, as one correspondent has suggested, the mixture was intended for forty ounces, and this would keep each ingredient within B.P. maximum doses.

Not the least difficult part of a dispenser's duties is to compensate for the want of practical pharmacy on the part of some members of the medical profession. If the prescription in No. 75 be written in accordance with the ancient view of the order of a prescription, that the first ingredient should be the basis, the second the auxiliary, the third the corrective, the fourth the vehicle, the balsam of Peru must be an important element, but as it does not enter into a single preparation of the British Pharmacopœia, its medicinal value may be doubted. It forms, however, an ingredient in this prescription, and must be dealt with accordingly. If from half to one-third its weight of calcined magnesia be stirred into the balsam Peru and the mixture allowed to stand some hours the mass may be made into pills; careful manipulation, however, is requisite to accomplish this.

The development of a fungoid growth in a lotion, No. 76, must be due to foreign organic matter in one of the ingredients. It should be prepared by dissolving the borax in the water, adding some, perhaps ℥j of glycerine, and making up to ℥x with distilled water. If it develops a fungoid growth in a week, there must be some impurity present, and the conclusion of the patient would not be far wrong.

Frequently a large quantity of essential oil forms part of a pill mass; how to combine it so that a mass of pilular form and consistence may be made is a difficulty, as in No. 77, and in this instance the ol. sabinæ is an essential part of the formula. It may be done by evaporating the ext. hyoscyam. to a tolerably firm extract, adding some glycerine and tragacanth excipient, and finally, a little powdered tragacanth; the whole of the oil may be taken up, and a good firm pill be made.

Quinine with sp. am. arom. will, as soon as the water is added, separate as a resinous substance, and adhere to the sides of the bottle, whether the quinine be alone or in combination, such as ferri et quin. cit. in No. 78. The addition of a little mucilage, as suggested by a correspondent, will to a certain extent obviate it. The separated substance is quinine, and on no account should it be removed; if it cannot be rendered miscible, it must be left in the bottle, but mucilage judiciously applied will suspend it.

A separation will frequently occur on the addition of an alkali to an infusion or decoction, as in No. 79, where pot. bicarb. is mixed with dec. pareiræ. This is not a case where it is desirable to add anything to diffuse the separated matter. A label to shake the bottle would be all that is necessary.

In making boracic acid ointment, No. 80, it is necessary to dissolve the boracic acid in a little water. This may be done in a test tube, and having melted the other ingredients, add the solution, and stir constantly till cold.

A good deal of trouble in dispensing is caused by want of attention to B. P. instructions, and this is very frequently the case with the extracts. The Pharmacopœia directs that they should be of a pilular consistence. If this were attended to, and extracts always found in that condition, there could be no difficulty in making up such a prescription as No. 81. If to the extracts of a pilular consistence the quinine in powder be added, the resulting mass must almost necessarily be firm. If the extracts be soft they should be evaporated at a low temperature, in a current of air or in a drying closet.

Bromohydric acid made after Fothergill's process contains acid tartrate of potash, and with quinine would throw down tartrate of quinine. If it be pure, —the only article admissible in dispensing—there would in a prescription, such as No. 82, be no precipitate, the mixture would be clear when made, and remain so. No matter by what processs the bromohydric acid be made, the resulting product if used in dispensing prescriptions should be pure. In connection with this subject, Dr. Squibb's paper, which appeared in a recent number of this Journal, is of considerable interest.

Ext. ergotinæ is Bonjean's extract of ergot, a soft extract, and is often combined with quinine, as in No. 83. A very good paper on the preparation of ergotine will be found in the 'Proceedings of the American Pharmaceutical Association, 1877.'

Nervine balsam is occasionally met with in family recipes, and in reply to No. 84, one formula for its preparation is appended.

Expressed Oil of Nutmeg	1 oz.
Oil of Rosemary and Cloves of each .	1 drachm.
Oil of Amber	½ „
Bals. Peru	1 „

Triturate together.

As an excipient perhaps glycerine and tragacanth is more generally applicable than any other, and with the ingredients of the prescription in No. 85, one of the best; a small quantity will be sufficient to convert them into a very satisfactory mass that may be rolled into pills which will maintain their shape.

Ung. plumbi. comp. P.L., as referred to in No. 86, is to some extent dependent on the make of the emp. plumbi. It was a favourite ointment with the late Sir Benjamin Brodie, and he recommended that made by one particular house. Probably the deficiency of the P.L. formula being recognized, great attention to the preparation enabled that house to make a more satisfactory ointment.

It is not professed to do impossibilities in the columns of this Journal, or assistance would gladly be offered in a solution of No. 87. The dispenser should make the pills so that together they weigh 22 grains and rest his reputation on accurate dispensing.

There is no official formula for glycerine of belladonna, but in reply to No. 88, it may be made the same strength as ung. bellad., using glycerine instead of lard. When there is no official formula the dispenser must, in the absence of the writer, be guided by some corresponding preparation that has Pharmacopœia sanction.

That curiosity which is given under No. 89 must in the present condition of our materia medica be considered as having outlived its reputation; some, if not all of the articles composing the receipt, will be found in the old Pharmacopœias, but more elegant pharmacy has taken their place.

It is impossible to make No. 90 without the whole of the bismuth as a sediment, and in addition a gradual subsidence from the lime water. The mixture should have a label indicating that the bottle is to be shaken before each dose.

There must necessarily be a precipitate on adding carbolic acid to liq. plumbi diacet. in making the lotion No. 91, and it certainly cannot be sent out clear, neither should the sediment, carbolate of lead, be filtered out.

If a dispenser studies the variety of combinations which come daily under his notice, and the decompositions which occasionally take place, he will be able to combat these minor difficulties, be in a position to state to his customers that he has accurately dispensed the prescription, and with average intelligence, and a little chemical knowledge, to explain why a certain result ensues, and that if correctly dispensed, no matter from what "London House" it emanates, it must have a similar appearance.

THE ORIGIN OF TRAGACANTH.*

BY M. GIRAUD.

The formation of gum in plants seems to depend upon a peculiar morbid condition, the main phases of which were investigated and described by Trécul in 1860. Although he studied the formation of gum only in the rosaceæ, it has been taken for granted that a similar process yields the gum of the acaciæ, which, being an article of commerce, is of much greater importance. The gum-disease is caused by a fulness of sap in the young tissues, whereby the new cells are softened and finally disorganized. Thus cavities are formed filled with liquid containing the fragments of the destroyed tissues. The cavities gradually increase in size in consequence of the disintegration of the neighbouring cells, and whenever they occur near the epidermal layers they may force an opening through them, and thus cause larger or smaller fissures; but if they remain enclosed on all sides they become receptacles of gum. This gum near the walls of the cavity appears in the shape of gelatinous warts, which grow, turn yellow or brown, and finally fill up the hollow space. When near fibres, it appears first to exude from them and gradually to alter them together with their contents. If the cavities occur near the bark, or near soft woody tissue, their contents occur in the well-known shape of transparent tears.

This is the origin of the gums in the rosaceæ and acaciæ, which consist mainly of gummic or metagummic acid. Tragacanth differs from these gums both in its origin and properties. Hugo v. Mohl considers it likewise as a pathological product, having some similarity with the other gums, and to be the result of a more or less complete transformation of the cells of the pith and of the medullary rays into a gelatinous substance, which swells by the imbibition of water to several hundred times the size of the original cells. On examining the anatomical structure of the astragali furnishing this substance we find that the pith and medullary rays have changed more or less and all the intermediate stages in this gradual transformation are observable. The cells, which originally assumed a hard horny consistence without altering their shape, ultimately condense into a homogeneous mass, in which the cell walls are no longer perceptible. This seemed to confirm the opinion of Guibourt, that the soluble portion of tragacanth consists of arabin and the insoluble portion of a mixture of cellulose and starch, both partly altered. But this view is as little exact as the statement generally met with in the books, that the soluble portion differs from arabin in not being thickened by ferric salts, and that after precipitation by alcohol it possesses a peculiar mucilaginous consistence. The portion insoluble in hot water was called bassorin, and stated to have the general constitution of amylaceous substances, to differ greatly from cellulose, and to be characterized by swelling greatly in water.

Guibourt mentions starch as a constituent and others have observed the same, and that vermiform tragacanth contains more than the flakes; the manner in which tragacanth forms, according to Mohl, would easily explain the presence of starch. But, evidently, if the recognition of such an easily recognizable body has been so difficult, it is even more so to recognize the nature of the main constituent which imparts to tragacanth its principal properties. Indeed, much confusion has existed on this point, and we are therefore the more rejoiced at meeting with researches by Giraud, by which an unexpected light is shed on it.

If, says the author, one part of tragacanth is digested in fifty parts of water, containing 1 per cent. of hydrochloric acid, the liquid filtered and then mixed with baryta water in excess, the gradually deposited precipitate will consist of pectate of barium. If this is collected, washed, diffused in water and then treated with muriatic or acetic acid, the base will dissolve, while the residue will consist of pectic acid. In this manner tragacanth will yield 60 per cent. of pectic acid. The process described shows plainly that pectic acid does not pre-exist in tragacanth, but is formed from some other substance. Giraud explains as follows:—

1. A very small percentage of tragacanth only is soluble

* Translated from *Archiv d. Pharm.*, December, 1877. From *The American Journal of Pharmacy*, March, 1878.

in cold water, not 30 to 50 per cent., as is sometimes stated. The soluble portion is not a substance similar to arabin, but a mixture.

2. If tragacanth is digested, in a water-bath, with 50 times its weight of water, the entire gummy constituent is transformed into a soluble gum, which after having been dried will not swell. The new product is not arabin, but pectin.

3. By subjecting this principle, with water containing one per cent. of acid, to the heat of a water-bath for two or three hours, it becomes entirely soluble, but still consists mainly of pectin, and, though precipitated by alcohol, is not gum, as usually stated. Sugar, formed simultaneously, amounts to scarcely one-tenth of the substance employed.

These experiments show that tragacanth is transformed by these processes into pectin, which is soluble in water, precipitated by alcohol, and by alkalies converted into pectates and metapectates. The pectin is generated from an insoluble pectinous principle, which constitutes more than one-half of the tragacanth, and is apparently identical with Frémy's pectose.

It is well known that pectose occurs largely in the tissues of many fruits and roots; it accompanies, nearly always, cellulose, with which, however, it cannot be confounded; for by the action of acids cellulose is transformed first into dextrin and afterwards into sugar, but never into pectin.

Giraud's observations, it will be seen, contradict Mohl's views, according to which the cellulose of the astragali is transformed into tragacanth.

The author has found tragacanth to have the following average composition;—20 water, 60 pectinous principle, 8 to 10 soluble gum, 3 cellulose, 2 to 3 starch, 3 per cent. of mineral constituents and traces of nitrogenated matter.

THE CULTURE OF CINCHONAS IN JAVA.

The following abstract is taken from the report on the Dutch Government Plantations for 1877:—

First Quarter.—The month of January was very stormy, with relatively a small quantity of rain. At Ragrak the plants suffered very much, about one thousand trees being uprooted. In February and March there were continuous rains. 21,128 Ledgeriana, 1290 succirubra and 6092 officinalis plants were planted. The incessant rains prevented the commencement of the collection. The Ledgeriana plants flowered freely and applications for seeds of this kind have been made from all sides. At the end of March the number of plants was:—

	In the Nurseries.	In the Open air.
Calisaya Ledgeriana	214,489	1,163,405
Succirubra and Caloptera	12,945	163,663
Officinalis	81,607	509,906
Lancifolia	500	36,054
Micrantha	—	512
	309,541	1,873,540

Second Quarter.—Rain fell during April, but the months of May and June were dry. This early dry weather was very favourable for the harvest, which was commenced in the middle of May.

A royal decree of the 28th of May authorized the Director to increase the number of cinchona plants in the plantations by one million.

The collected barks, examined by Oudemans and Stellingwerff, were found to be all that could be desired. The waste from the barks, which was formerly exported after previous pulverization, is now sent away just as it is, with the result that it is more sought for.

In consequence of the favourable season it was possible by the end of June to send to Yicao 25,568 pounds of cinchona bark, whilst a nearly equal quantity was quite ready for a fresh consignment. It is estimated that the general harvest amounted to upwards of 100,000 pounds (Dutch).

Lately the cinchonas have suffered from the ravages of a hemipterous insect, the *Heliopeltis theiovora*, which also attacks the tea plant. These insects, when winged or in the young unwinged state, feed upon the juices contained in the younger portions of the bark. The parts invaded by the insects cease to grow, the leaves as well as the young branches droop, shrivel, and become black, and when all the young branches are attacked, which is generally the case, the plant ceases to grow until the new buds form. For some time past precautions have been taken against the multiplication of this pest, and the destruction of birds in the neighbourhood of the cinchona plantations has been forbidden. It has also been recommended to cut off and burn the young branches that have turned brown, as containing the eggs of the insects. One point worthy of notice is that the low lying plantations suffer most from the attacks of this insect; in those above 3000 feet attacks are rare; whilst above 6000 feet the insect does no harm.

Third Quarter.—These three months were characterized by remarkably dry weather. Rain was rare, and in some stations only one or two rainy days were reckoned. During the whole of this period the temperature frequently descended to 6·6, and twice there was a slight frost during the night. This extraordinary dryness did not injure the larger plants, but many of the smaller plants succumbed. The frosts were very injurious at some of the plantations. The great drought also gave rise to several fires, which in some places spread to the plants. Towards the end of August, when the insects had become rare, the branches that had suffered from them were cut off and burnt.

The harvest now terminated. During the three months there were sent to Yicao, for shipment to Holland, 63,220 pounds of bark, and 3130 pounds for the medical service in Java. About 7000 pounds more were ready for consignment. In September an enormous quantity of seeds was sent out. At this time the numbers of the plants in the plantations were as follows:—

	In the Nurseries.	In the Open air.
Calisaya Ledgeriana and Hasskarliana	201,969	1,118,717
Succirubra and Caloptera	32,437	153,785
Officinalis	83,207	503,268
Lancifolia	500	36,017
Micrantha	—	512
	318,113	1,812,299

WARREN'S STYPTIC BALSAM.

The original formula appears to have been published by Dr. James Warren, of Boston, in the New York *Journal of Medicine* in 1854, and read as follows:—

℞. Acid. Sulphurici .... ℨ v. (by weight)
Spt. Terebinthinæ
Spt. Vini rectif ....āā f. ℨ ij.

Place the acid in a Wedgwood mortar, and add the turpentine slowly, stirring it constantly with the pestle; then add the alcohol in the same manner, and continue stirring it until no more fumes arise, when it may be bottled, and should be stopped with a ground-glass stopper. None but the purest materials must be used, and when done, it should exhibit a dark but clear red colour, like dark blood; but if it be a pale dirty red it will be unfit for use. The dose is 40 drops, and the method of using is as follows: Put a teaspoonful of brown sugar in a tea-cup, and rub in 40 drops of the balsam until thoroughly incorporated, and then slowly stir in the water until the cup is nearly full; when it should be immediately swallowed. This dose may be repeated at intervals of an hour, until three or four doses have been taken, if necessary; and its use should be discontinued when fresh blood ceases to flow. After standing a few days, a pellicle forms upon the surface of the balsam, which should be broken and the liquid below it used. It does not deteriorate by age, if tightly stopped.

The "balsam" is recommended to be used in hemoptysis, hematemesis, epistaxis, and menorrhagia, and some of our correspondents say that it has proved very serviceable in their hands.

The Pharmaceutical Journal.

SATURDAY, MARCH 30, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE MEDICAL ACTS AMENDMENT BILL.

SOME months ago, when Dr. LUSH's Medical Acts Amendment Bill was under the consideration of the Medical Council, it was the opinion of the Committee which reported on the Bill, that the Legislature would never accept a provision of such stringency as that by which any unregistered person practising medicine or surgery for gain would have been rendered liable to prosecution and penalties. The same Committee suggested that attempts to repress medical imposture should be deferred until such time as the Medical Acts had received all requisite amendments in the provisions relative to the medical profession itself; for, as Mr. SIMON tersely pointed out, the Council could not conveniently consider how to deal with trespassers until it was known what were the limits of the medical profession as fixed by law.

A step in the direction of providing that internal regulation of the medical profession has just been made by the introduction into the House of Lords of another Bill to amend the Medical Acts.

The Duke of RICHMOND and GORDON, in presenting the Bill, said it was intended to remedy some of the defects of the Medical Acts now in force, and especially to meet the difficulty existing in Scotland owing to which it has not yet been feasible to establish a conjoint Board and have one uniform qualifying examination for medical practitioners.

To judge from the comments of the several medical papers, this Bill does not appear to be regarded with much favour by the medical profession, and the *Times* characterizes its various provisions as forming a sort of ornamental frame, the weak point of which is that it contains no picture.

The sections of the Bill which have, as they now stand, most interest for the trade are those relating to unregistered persons and to the practice of dentistry.

The section relating to this latter subject provides, like Sir JOHN LUBBOCK's Bill, for the registration of all persons, *bonâ fide* engaged in the practice of dentistry, either separately or in conjunction with the practice of other branches of medicine or surgery. It also provides that any unregistered person who practises dentistry for gain, and uses the designation of dentist or its equivalent, is to be subject to a penalty of twenty pounds.

As regards the general practice of medicine or surgery the Bill recognizes but two classes of persons, viz., those who are registered and those who are not registered, and it provides that if any one of the latter class takes or uses the designation of any qualification or medical diploma which entitles a person to be registered or call himself physician, surgeon, apothecary, or doctor, or by any other designation used to distinguish registered practitioners of medicine or surgery, or to indicate the possession of a qualifying certificate or qualification to practise medicine or surgery, he renders himself liable on summary conviction to a fine of twenty pounds.

It is important, however, to note in reference to this section of the proposed Bill that all it does with the object of enabling the public to distinguish between competent and incompetent practitioners is to restrict the use of titles to such persons as have been placed upon the medical register and have thus become duly qualified. There is not only no approach towards a prohibition of practice by unregistered persons, but there is a direct assumption that such persons do practise; and in the very wording of the section this is evident, since it speaks of persons who, not being registered in medicine or surgery, practise for gain or are engaged in the cure or treatment of diseases or injuries, and it is these persons who are to be liable to penalties not for practising but for assuming titles indicating qualification, or in other words that they are registered.

There is also in the Duke of RICHMOND's speech a like recognition of the fact that medical men properly so-called who possess the due legal qualification have not thereby any special monopoly of the practice of medicine, for after pointing out that the Bill does not attempt to prohibit any unregistered person from practising he remarked parenthetically—"that is impossible." The *Times* likewise expresses the same view in commenting upon the Bill as one which deserves to be considered by all actual or possible patients almost as closely as by practitioners themselves, and while insisting that unqualified persons ought not to be able to represent themselves as being other than they are, admits that no one would wish in the present state of civilization and enlightenment to render so-called medical practice by unqualified persons impossible.

These expressions of opinion are of no small importance in reference to the pretensions of a certain section of the medical profession, and they have such a cogent bearing upon the attempts which have recently been made to stir up strife between medical men and chemists and druggists that we think it worth while to call the attention of our readers to them as endorsing what we have always maintained to be a proper view of the subject.

We thoroughly agree with those who think that there should not be any question with regard to the propriety of granting special privileges to those who take the pains to acquire the skill and knowledge requisite for rendering efficient medical or surgical services to the community, inasmuch as these special privileges constitute a means of fostering and encouraging such skill and knowledge. But while doing this it is by no means necessary to admit that other persons, who have not applied themselves in the same manner, are not to be at liberty to recommend the use of simple remedies without trenching upon the legitimate province of the medical man. To do this would be to debar every housewife from administering the wholesome dose of brimstone and treacle, whose virtue she has learnt from her grandmother, without dreaming of the medical register, and if unregistered persons generally have the right to recommend and administer medicines to each other in this way it is simply ridiculous to contend, that those among them who from their training and daily avocations are necessarily most conversant with the properties and uses of drugs and medicines should be in a legal point of view less competent to do what it is open to anybody else to do without limitation.

We do not attempt to contend that in what is termed counter practice, no chemists and druggists exceed the limits within which such practice should be restricted, and at the same time we know that a large number refuse altogether to prescribe, upon the principle that it is undesirable for the pharmacist to do so. But neither circumstance can be reasonably urged as furnishing an argument against the propriety of a chemist and druggist giving his customers the benefit of his knowledge of drugs and their uses to suit the requirements of the moment, and if it can be maintained that this is practising medicine that does not in any degree lessen our belief in the soundness of the opinion that it is impossible to prevent it.

THE EVENING MEETING.

An Evening Meeting of the Pharmaceutical Society will be held at 17, Bloomsbury Square, on Wednesday next, the 3rd of April, when the following papers will be read:—"Salicylic Acid," by Mr. J. Williams; "Note on Grindelia robusta," by Mr. E. M. Holmes; and "Note on the Alkaloid of Duboisia myoporoides," by Mr. A. W. Gerrard. The chair will be taken at half-past eight o'clock precisely.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting of the above Association will be held on Wednesday next, April 3rd, at its room, 29, Brewer Street, Regent Street, when a paper on "Pill Coating" will be read by Mr. Bull.

We are glad to know that Mr. James George Frazer, who has taken the second honours in the Cambridge University Classical Tripos, is the son of Mr. Daniel Frazer, Pharmaceutical Chemist, of Glasgow. It appears to us to be a subject for congratulation that although some persons think the Preliminary examination too severe a test of the education required by a young man aspiring to become a chemist and druggist, there are instances which show that pharmaceutical associations are not always deemed incompatible with a much higher standard.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on March 22, Dr. Gladstone, F.R.S., President, in the chair. After the announcement of visitors, etc., the following certificates were read for the first time:—Messrs. G. A. George, W. Jago, H. W. Jones, and J. W. Knights. The President then announced that Mr. E. Neison having proposed Mr. C. T. Kingzett as a member of the Council, the name of the latter gentleman would be suspended along with the list of names recommended by the Council.

The first paper was read by Dr. Otto N. Witt—

On Aromatic Nitrosamines. In 1874 the author made some experiments on the action of nitrous acid and especially its ethers on secondary and tertiary amines; the facts observed were communicated to the chemical societies of Zurich and Berlin. In his inaugural dissertation (1875) the author gave a detailed account of the formation and properties of diphenylnitrosamine. Since that time a more careful study of some complicated reactions of diphenylnitrosamine has been made, and the results of these investigations the author gives in the following paper:—Whenever a secondary amine is acted upon by nitrous acid water is given off and a nitrosamine (*i.e.*, a substituted ammonia which contains, instead of at least one hydrogen, the monovalent group NO in immediate connection with the ammoniacal nitrogen) is formed. Thus—

$$\underset{\text{Diethylamine.}}{\begin{matrix} C_2H_5 \\ | \\ NH \\ | \\ C_2H_5 \end{matrix}} + HONO = H_2O + \underset{\text{Diethylnitrosamine.}}{\left\{\begin{matrix} C_2H_5 \\ | \\ N{-}NO \\ | \\ C_2H_5 \end{matrix}\right.}$$

Similarly by the action of ethylic nitrite, amylic nitrite, or nitrous vapours on diphenylamine, diphenylnitrosamine is formed. This latter substance crystallizes readily in large honey-coloured monoclinic crystals, melting at 66·5°, soluble in alcohol, benzol, etc. It dissolves rapidly in concentrated sulphuric acid with a beautiful blue colour, large quantities of nitric oxide being evolved. Powerful reducing agents split off ammonia and reproduce diphenylamine. The action of aniline and other primary monamines on diphenylnitrosamine is violent, diphenylamine being regenerated with the formation of diazobenzol, the latter forming successively diazoamidobenzol and amidoazobenzol. Under certain circumstances a secondary reaction takes place, a substance, $C_{36}H_{29}N_5$, being formed, which when heated with sulphuric acid gives a blue colouring matter with a crimson fluorescence and a spectrum with three dark bands. If ordinary ethylic nitrite, obtained by passing nitrous vapours into alcohol, be used, a mixture of products is formed, in the investigation of which the author encountered much difficulty. When burnt in a combustion-tube these bodies gave off rapidly large quantities of nitrous vapours, whilst a very dense charcoal was left behind which was difficult to burn completely.

On investigation, the author found that the substance commonly called anhydric nitrous acid (prepared by the action of nitric acid on starch, etc.) is really N_2O_4, and splits up by contact with alcohol or water into nitric and nitrous acids. Thus ordinary ethylic nitrite always contains nitric acid. The author therefore used mixtures of pure amylic nitrite and nitric acid; acting with these on known weights of diphenylamine, and moderating or accelerating the reactions by the use of various solvents, he has obtained mononitrodiphenylnitrosamine, and two bodies, which on the removal of their nitroso groups, yielded dinitrodiphenylamine and an isomer,—mononitrodiphenylnitrosamine. To 20 grams of diphenylamine finely powdered, a mixture of 15 c.c. nitric acid, 35 grams pure amylic nitrite and 100 c.c. of methylated alcohol is added; on shaking, and if necessary heating, crystals separate; the liquid is now cooled by ice, when a crystalline deposit is obtained which is filtered off, washed with spirit, dried and recrystallized from chloroform. This substance forms light yellow plates, melting at 133·5° C., soluble in benzol, hot alcohol and glacial acetic acid; when treated with strong sulphuric acid it gives off nitric oxide, the liquid becoming purple. By the action of aniline or alcoholic potash, mononitrodiphenylamine was obtained in pale yellow glistening scales melting at 132° C.; it does not colour sulphuric acid, but dissolves in alcoholic potash with a fine red colour. By the action of bromine on mononitrodiphenylnitrosamine dissolved in glacial acetic acid, two products were obtained: one in canary-yellow coloured silky needles, fusing at 208·5°-209°, the second in heavy well-shaped small prisms, melting at 214·5° to 215°. If instead of the quantities given above, the following be used: 17 grams diphenylamine, 50 c.c. glacial acetic acid, 40 c.c. nitric acid, 50 c.c. methylated spirit, and 48 grams nitrite of amyl, a light yellow sandy powder is obtained which dissolves in sulphuric acid with a dirty violet colour, nitric oxide being given off. The analyses seemed to indicate a formula intermediate between di- and trinitrodiphenylnitrosamine. The author therefore acted on the substance with aniline and alcoholic potash, and precipitated the resulting liquid with dilute hydrochloric acid. By treating this precipitate with alcohol, a solution was obtained, which furnished long thick pointed dark yellow needles, fusing at 214°, dissolving in alcoholic potash with a bright purple colour. Analysis proved this substance to be dinitrodiphenylamine. The residue insoluble in alcohol was recrystallized from xylene and obtained in granular vermilion crystals, fusing at 211·5° which dissolve in alcoholic potash with a scarlet colour. Analysis proved this substance to be isomeric with the last. All the above substances, when treated with strong nitric acid, yield hexanitrodiphenylamine. The author points out that the method of nitration above described will probably be found applicable in many cases where nitration has hitherto offered unusual difficulties, and also lends some support to the theory that the formation of nitroso compounds always precedes the introduction of the nitro-group into the molecule of aromatic substances. The author mentions in conclusion that Mr. Meldola communicated to the *Chemical News* (February 8th, 1878) a note on a new colouring matter; on examination this new dyestuff "citronin" turned out to be a mixture of mono- and dinitrodiphenylamines. Mr. Meldola, on learning that the author had been engaged with these bodies for some years, relinquished the investigation. For this act of courtesy the author thanks Mr. Meldola, but wishes to state that the merit of the practical application of this substance as a dyestuff belongs solely and entirely to that chemist. The author promised a second paper in continuation of the research, and stated that but for the incident just referred to he should not have published his researches at so early a date.

Mr. Meldola said that Dr. Witt had given a perfectly correct statement of the case as far as he was concerned; at the time he first obtained citronin, he was aware that Dr. Witt had been working at the subject, and therefore thought that he was the proper person to communicate with; his communication, he ventured to think, considering the interesting paper they had just heard, had been attended with the happiest results as regards the Society and himself.

Mr. Groves remarked that when phenol is acted upon by dilute nitric acid a small quantity of nitroso compounds seems to be first formed; also in the formation of trinitroorcin, nitroso compounds seemed to be at first produced, thus confirming the statement of Dr. Witt.

Dr. Armstrong thought that although in many cases we had evidence of the preformation of nitroso compounds, yet it probably was not always the case. Thus some of the sulpho acids of phenol nitrate with very great readiness, without any indication of nitroso compounds being formed.

After a short discussion between Drs. Armstrong and Witt as to the constitution of the bodies mentioned in the above paper, the President gave the best thanks of the Society to Dr. Witt for his interesting paper, which was illustrated by experiments and the exhibition of specimens of the above beautifully crystallized substances.

The next paper was read by Dr. Armstrong, and was entitled—

On a New Process for the Volumetric Estimation of Cyanides. By J. B. Hannay. The cyanide is dissolved in water and the solution is rendered alkaline by ammonia. A half strength decinormal solution of mercuric chloride is run in with constant stirring. At first the reaction $2KCN + HgCl_2 = Hg(CN)_2 + 2KCl$ takes place, but as soon as all the cyanide has been thus decomposed, the slightest trace of mercuric chloride renders the liquid distinctly opalescent. The end of the reaction is sharply marked and very delicate. Many experiments were performed as to the action of alkaline sulphites, chlorides and nitrates; the results were similar to those already obtained by Tuson and Neison (*Chemical Society's Journal*, 1877, ii., 679). Very large quantities of ammonium salts prevent the appearance of the opalescence; cyanates and sulphocyanides do not interfere; the presence of silver salts does not hinder the reaction. The author, therefore, recommends the process as one of great facility.

The next paper was read by Mr. M. M. P. Muir—

On Certain Bismuth Compounds. Part VII. In the first portion of this paper the author details reactions illustrating some points of contrast between bismuthous and phosphorous chlorides. The latter substance is oxidized with comparative ease, and therefore acts as a reducing agent in certain reactions; the former undergoes only incomplete oxidation, and therefore exerts no action in such cases. The two oxalates of bismuth, $Bi_2 3 C_2 O_4 . 6 H_2O$ and $Bi_2C_4O_8$ are then studied. Experiments on the production of some so-called bismuthates are next detailed. The author inclines to the hypothesis that the higher oxides of bismuth exhibit exceedingly feeble acid characters. The paper concludes with the description of some experiments on bismuthous iodide. The oxidation of this compound by air when in a fused state is compared with the behaviour of the corresponding chloride and bromide under similar conditions; the iodide oxidizes much more slowly than either the chloride or bromide. Bismuthous iodide prepared in the wet way is more readily decomposed by water than the same salt prepared in the dry way.

The thanks of the Society were given to the author, who exhibited an interesting series of bismuth compounds.

Mr. Williams then exhibited a splendid sample of a salicylic acid, about twenty-four ounces, prepared from the oil of wintergreen, the natural product crystallizing apparently better than the artificially prepared acid; also about one gallon of pure methylic alcohol.

Dr. Witt, in answer to Mr. Maxwell Lyte, said that the "vinasses," formerly a waste product of the beetroot sugar manufacturer, had lately been utilized under a patent for the production of methylic chloride, which was largely used by the aniline colour manufacturers. The gas was prepared, washed, and pumped into metal reservoirs each containing twenty-five kilogrammes. The patentee, Brigonnet, making as much as one thousand kilos a day.

The Society then adjourned to April 4 (Anniversary Meeting, Saturday, March 30), when a lecture "On the Application of the Microscope to some Special Branches of Chemistry," will be delivered by H. C. Sorby, F.R.S.

UNIVERSITY OF EDINBURGH CHEMICAL SOCIETY.

The seventh meeting of the session was held on March 13; Mr. W. Inglis Clark, B.Sc., in the chair.

A paper was read by Mr. Adrian Blaikie on the "Salts of Trimethylsulphine," containing the results of an investigation carried on by Professor Crum Brown and the author.

The hydrate of trimethylsulphine obtained by acting on the iodide of trimethylsulphine with moist oxide of silver in concentrated solution rapidly absorbs sulphuretted hydrogen, forming a sulphydrate of trimethylsulphine.

$$(CH_3)_3\,S.OH + H_2S = (CH_3)_3S.SH + H_2O$$

The strong solution of this hydrate has all the reactions of an alkaline sulphydrate, and when evaporated oxidizes slowly to the hyposulphite of trimethylsulphine.

The sulphide of trimethylsulphine is obtained by mixing equal quantities of solutions of oxyhydrate and sulphydrate of trimethylsulphine.

$$(CH_3)_3\,S.OH + (CH_3)_3SSH = \left\{(CH_3)_3S\right\}_2 S + H_2O$$

The aqueous solution when evaporated over phosphoric anhydride in an atmosphere of coal gas, does not crystallize out, but after a certain strength of solution has been reached begins to decompose into sulphide of methyl,

$$\left\{(CH_3)_3S\right\}_2 S = 3\,(CH_3)_2S$$

which, when the solution is contained in a sealed tube, separates out, forming a layer of sulphide of methyl above the aqueous solution. This solution has, however, all the characteristics of an alkaline sulphide. It dissolves sulphide of antimony, gives the reaction with sodic nitroprusside, and with hydrochloric acid gives off sulphuretted hydrogen, leaving the chloride of trimethylsulphine, easily recognized by mercuric chloride, when the double salt crystallizes out. When exposed to the air the sulphide of trimethylsulphine is rapidly oxidized to the hyposulphite.

The hyposulphite of trimethylsulphine is best obtained by oxidation of the polysulphide obtained by dissolving sulphur in the sulphide.

$$\left\{(CH_3)_3S\right\}_2 S + 4S = \left\{(CH_3)_3S\right\}_2 S_5$$

By exposing the polysulphide to the air for a few days the sulphur crystallizes out, and the hyposulphite is left in solution, and by careful evaporation is obtained in clear four-sided prisms with one molecule of water of crystallization.

$$\left\{(CH_3)_3S\right\}_2 S_5 + 3O = \left\{(CH_3)_3S\right\}_2 S_2O_3 + 3S$$

The following are results of analysis:—

I. 0·1192 gr. substance gave 0·0745 gr. H_2O 0·1086 gr. CO_2

II. 0·2299 gr. substance gave 0·1402 gr. H_2O 0·2056 gr. CO_2

III. 0·2600 gr. substance gave 0·8459 $BaSO_4$ = 0·1161 gr. S.

	Found I.	II.	III.	calculated for $\left\{(CH_3)_3S\right\}_2 S_2O_3 + H_2O$
C	24·85	24·64	——	25·35
H	6·94	7·06	——	7·04
S	——	——	44·65	45·07

The salt is very hydroscopic, sparingly soluble in alcohol and gives all the reactions of an alkaline hyposulphite. Over phosphoric anhydride the water of crystallization is given off. 7·261 grams of the salt lost 6·37 per cent of water, which is present in the crystallized salt to the extent of 6·33 per cent.

This compound if interesting from a theoretical point of view, since the constitutional formula may be represented with dyad, tetrad, and hexad sulphur atoms in one molecule.

$$\begin{matrix}(CH_3)_3\equiv S^{iv} - S^{ii} \\ (CH_3)_3\equiv S^{v} - O\end{matrix}\Big\rangle S^{vi} \begin{matrix} = O \\ = O\end{matrix}$$

For the same reason, on the assumption that the polysulphide is a sulphate in which all the oxygen atoms are replaced by sulphur, and also because in it, on this assumption, we may have seven atoms of sulphur directly grouped together, is the polysulphide of trimethylsulphine from which the hyposulphite is obtained.

$$\begin{matrix}(CH_3)_3\equiv S^{iv} - S^{ii} \\ (CH_3)_3\equiv S^{iv} - S^{ii}\end{matrix}\Big\rangle S^{vi} \begin{matrix} = S^{ii} \\ = S^{ii}\end{matrix}$$

The anhydrous hyposulphite when carefully heated to 135° C. gives off sulphide of methyl. 5·545 grams gave off when heated 23·58 per cent. sulphide of methyl, leaving on cooling a white crystalline mass soluble in water, alcohol, and ether, and very hydroscopic. The quantity of sulphide of methyl given off points to a methyl-hyposulphite of trimethylsulphine, since if the hyposulphite gave off 23·30 per cent. sulphide of methyl we should expect a substance having that composition.

$$\left\{(CH_3)_3S\right\}_2 S_2O_3 - S\,(CH_3)_2 = \begin{matrix}CH_3 \\ (CH_3)_3S\end{matrix}\Big\rangle S_2O_3$$

This product of decomposition is at present under investigation; by further heating at 140° sulphurous acid gas is evolved.

The oxalate of trimethylsulphine is obtained by acting on the iodide with oxalate of silver, and can be obtained in clear very hydroscopic plates with one molecule water of crystallization. The following are the results of analysis:—

I. 0·1526 gr. substance gave 0·1082 gr. H_2O 0·2068 gr. CO_2

II. 0·1823 gr. substance gave 0·1296 gr. H_2O 02489 gr. CO_2

	Found I.	II.	Calculated for $\begin{matrix}COO—S(CH_3)_3 \\ COO—S(CH_3)_3\end{matrix} + H_2O$
C	36·95	36·78	36·92
H	7·87	7·89	7·69

On carefully heating the salt at 110° C. the water of crystallization is given off, and at 140° C. sulphide of methyl, leaving pure oxalate of methyl, which crystallized out, and was recognized by its melting point 51° C. and its boiling points 157° C.

$$\left\{(CH_3)_3S\right\}_2 (OOC)_2 + H_2O = (CH_3)_2(OOC)_2 + 2S(CH_3)_2 + H_2O$$

The chromate and iodate of trimethylsulphine can both be prepared by means of the silver salts from the iodide. Both these salts on heating to about 140° C. melt, but immediately afterwards explode, the former leaving green oxide of chromium. The further decomposition of the hyposulphide of trimethylsulphine and of various other salts is under investigation.

A paper was also read by Mr. John Treharne, M.B., C.M., "On the Cooling of Fats."

If equal bulks of the fats of mutton, beef, pork, and butter, and palm oil be heated to 100° C. in small flasks fitted with a thermometer through the cork, and then allowed to cool by radiation under the same conditions for each, the temperature is found to fall regularly to a certain point (which is different for each of the fats above named), and then to rise to a certain turning point. These turning points are approximately as follows:—

For Mutton	fat	40° C.
,, Beef	,,	28·5°
,, Pork	,,	26·5°
,, Butter	,,	23·5°
,, Palm oil	,,	21°

The extent of the rise in temperature is different in each fat, being greatest in that of mutton, and least in that of butter and palm oil. The extent of the rise is also greater within certain limits the greater the quantity of fat employed; but, as a rule, the turning point is pretty constant for the same fat. There is also a little difference in the turning points and the extent of rise according to the part of the carcase from which the fat has been taken.

If temperature and time be taken as co-ordinates, and the rate of cooling be represented by curves these latter will be characteristic of the respective fats.

A mixture of equal parts of mutton and butter fats does not give a curve intermediate between those of its two components; but is such as to indicate that less heat is given out in cooling (to 20° C. say) than in the case of butter, which, compared with mutton fat, gives off very little heat.

LONDON INSTITUTION.

On Monday, March 11th, a most interesting lecture was delivered at the London Institution by Mr. Francis Darwin. We take the following report of it from *Nature.*

The Analogies of Plant and Animal Life.*

BY FRANCIS DARWIN, M.B.

Let us begin our inquiry into the analogies of plant and animal life by comparing the egg of an animal with the seed of a plant. Let it be the ripe seed of a common plant, and the egg of a bird. Both seed and egg may be said to consist of the young creature and a supply of food which is stored up for its use, and is gradually exhausted as the young creature develops. Every one who has tried when a boy to blow a late bird's egg must have been painfully alive to the fact of its containing a young animal, and the egg we eat for breakfast may serve to remind us of the store of food which we diverted from its proper course of nourishing a young chicken.

Here is a diagram representing a section through the seed of a poppy, in which the young plant may be seen lying in its store of food containing a supply of carbohydrates and nitrogenous matter, which is consumed as the yolk of the egg is consumed by the young chicken. Other seeds, such as a bean, an acorn, or an almond, seem at first sight to consist of nothing but the young plant, and to have no store of food. The two halves into which a pea split are the two first leaves or cotyledons of the young plant, the embryo stem and root being represented by the little projecting mass lying between the two halves at one end of the seed. Here the store of food is laid up in the body of the young plant just as many young animals carry with them a store of food in the shape of the masses of fat with which they are cushioned; the two leaves which seem so gigantic compared with the rest of the plant are filled with nutriment, and perform the same function of supplying food for the growth of the seedling which is performed by the mass of nutrient material in which the embryo of the poppy seed is embedded. Recent researches have shown that embryo plants are possessed of powers which even in the present day it seems almost ludicrous to ascribe to them. I mean powers of digestion. Gorup-Besanez,† a distinguished German chemist, found that in the germinating seed of a vetch a ferment exists similar to the ferment in the pancreatic secretion of animals—a secretion having the power of reducing both nitrogenous bodies and starch to a condition in which they can be utilized and absorbed by the tissues, so that the embryo plant behaves exactly as if it were a minute animal digesting and absorbing the store of food with which it is supplied. The power of digesting starch possessed by the embryo plant has been brilliantly demonstrated by van Tieghem,* who found that the embryo removed from the seed of the marvel of Peru (*Mirabilis jalapa*) was distinctly nourished if placed in an artificial seed made of starch paste. He found that the starch paste was actually corroded by the young plant, proving that a digestive ferment had been at work.

This wonderful experiment is of special interest as proving that the digestive ferment is a product of the young plant itself, just as the digestive juice of an animal is a secretion from its stomach. It is indeed a striking thought that whether we grind up a grain of wheat to flour and eat it ourselves as bread, or whether we let the seed germinate, in which case the young plant eats it, the process is identically the same.

The power of storing up food in a fixed condition and utilizing it when required is a most important function both in animal and plant physiology. And just as this utilization is seen in the seed to be brought about by a ferment—by a digestive process—so probably wherever the transference or utilization of food stores occurs it is effected by ferments. If this be so it would seem that the processes of digestion proper, as they occur in the stomach and intestines of animals and on the leaves of carnivorous plants, I say it is probable that these processes are only a specialization† of a widely spread power, which may exist in the simplest protoplasmic ancestor of animals and plants. In this case we shall have no right to consider the existence of carnivorous plants anything strange or bizarre; we should not consider it, as seems sometimes to be done, an eccentric and unaccountable assumption of animal properties by plants; but rather the appearance of a function which we have quite as much right to expect in plants as in animals. Not that this view makes the fact of vegetable digestion any less wonderful, but rather more interesting as probably binding together by community of descent a wide class of physiological functions. Let us now pass on to consider the analogies of plants and animals in a more advanced stage of life.

Great differences exist among animals as to the degree of development attained before the young ones enter the world. A young kangaroo is born in a comparatively early stage of development, and is merely capable of passive existence in its mother's pouch, while a young calf or lamb soon leads an active existence. Or compare a human child, which passes through so prolonged a condition of helplessness, with a young chicken which runs about and picks up grain directly it is out of its shell. As analogous cases among plants, we may take the mangrove and the tobacco plant. The ripe seed of the mangrove is not scattered abroad, but remains attached to the capsule still hanging on the mother plant. In this state the seeds germinate and the roots grow out and down to the sea-level, and the plant is not deserted by its mother until it has got well established in the mud. It is due to the young mangrove to say that the conditions of life against which it has to make a start are very hard on it. The most intrepid seedling might well cling to its parent on finding that it was expected to germinate on soft mud daily flooded by the tide. Perhaps the same excuse may be be offered for the helplessness of babies—the more complicated the conditions of life, the greater dependence must there be of offspring on parent.

Now compare a young tobacco plant with the mangrove. All the help the seedling tobacco receives from its parent is a very small supply of food; this it uses up in forming its first pair of leaves; it has then nothing left by way of reserve, but must depend on its own exer-

* A lecture delivered at the London Institution on March 11 by Francis Darwin, M.B. From *Nature*, March 14, 1878.

† *Deutsch. chem. Gesellsch.*, 1874; *Botanische Zeitung*, 1875, p. 565.

* *An. Sc. Nat.*, 1873, xvii., p. 205.

† See Morren, 'La Digestion Végétale,' Gand, 1876; and Pfeffer, 'Landwirth. Jahrb.," 1877.

tions for subsistence. By its own exertions I mean its power of manufacturing starch (which is the great article of food required by plants) from the carbonic acid in the air. In this respect it is like a caterpillar which is formed from the contents of the egg, but has to get its own living as soon as it is born.

In many cases there is a certain degree of independence in young creatures, which are nevertheless largely dependent on their parents' help. Thus, young chickens, though able to feed themselves, depend on their mother for warmth and guidance. A somewhat parallel case may be found among plants. It has been shown that the large store of reserve material in a bean is not all needed for the development of the seedling. It has been proved that well formed and flourishing seedlings are produced, even when a large part of the cotyledons has been removed. In fact, the store of food in the bean has been said to play a double part in the plant* first, as giving absolutely necessary formative material, and secondly, as protecting the young plant in the struggle with other plants, by supplying it with food till it is well established and able to make its own food. This view was fully established by my father,† who sowed various kinds of seed among grass in order to observe the struggle; he found that peas and beans were able to make a vigorous start in growth, while many other young plants were killed off as soon as they germinated.

The young bean is thus indirectly protected by its mother from death, which the severe competition entails on less fortunate seedlings. This kind of protection can only in a certain general sense be compared with the protection given by parent to offspring. Nevertheless, a more strictly parallel case may be found among animals. Certain fishes retain the yolk bag, still containing a supply of food, and swim about leading an independent life, carrying this store with them. Among plants, a good case of a retention of a store of food occurs‡ in the oak. Young trees possessing woody stems and several leaves may still have an acorn underground with an unexhausted store of food.

In comparing the lives of plants and animals, one is struck with the different relation which the welfare of the race bears to the welfare of the individual. In plants it is far more obvious that the aim and object of existence is the perpetuation of the species. The striking and varied development of the reproductive organs in plants is one factor in this difference. Roughly speaking, plants strike us most by their flowers and seed—that is by organs serving the interest of the race. Animals are most striking on account of their movements, which are chiefly connected with the wants of the individual. If a child wants to know whether a stick *is* a stick or a caterpillar, he touches it, and if it walks off classes it in the animal kingdom. Of course, I do no not mean that the power of movement is a mark of distinction between animals and plants, but it certainly is a power which is well developed in most animals, and badly developed in most plants. It is the absence of locomotive powers (as opposed to the absence of simple movements) that especially characterizes most plants. One sees the meaning of this if one inquires into mode of life of stationary and of locomotive animals. Stationary animals either inhabit the water, or else are parasitic in habits, and live on tissues of plants or animals. In either case the absence of locomotion has the same meaning. Many aquatic animals derive their food from the minute organic particles floating in the water, so that even though they lead a stationary life, food will be brought to them by the currents in the water. Parasitic animals obtain their food directly from the juices or sap of their host, so that they do not need to move about as other animals do in search of food. In the same way plants live like parasites on the earth, penetrating it with their roots and sucking out its juices; and their food—carbonic acid—is brought to them by the currents of the air, so that like both an aquatic and a parasitic animal, they have no need of locomotion as far as concerns the obtaining of food.

In the case of many young animals their powers of locomotion would be useless unless the eggs were deposited by the mother in a proper place; one cannot imagine anything more forlorn than a caterpillar reared from an egg laid anywhere by chance, and expected to find its proper plant. The necessity of finding proper places to lay her eggs implies the necessity of locomotion on the part of the mother. This need of locomotion is, of course, equally a need to the plant, but it is supplied in a distributed way. The seeds themselves becomes locomotive; they either acquire plumes to fly on the wind like the seeds of dandelions or they become burrs and cling to passing animals, or are distributed in other ways. Various and strange are the means of transport adopted by seeds; for instance, the acorn seems to distribute itself by deliberately trading on the carelessness of creatures which are usually considered its superiors in intelligence. Good evidence exists that young oaks which grow scattered in large number over a wide extent of wild healthy land have sprung from the acorns accidentally dropped by passing rooks. In all these cases the young plant has to trust to chance as to what kind of soil it will be deposited in, and this of course accounts for the enormous number of seeds produced by plants. Some seeds are more fortunate in possessing a kind of mechanical choice or power of selecting suitable places to grow in. Many years ago my father described a plumed seed which, when damped, poured out a sticky substance capable of gluing the seed firmly to whatever touched it. Imagine such a plant blown by the wind over some sandy waste; nothing tends to stay its course till it happens to pass by a region where the soil is damper; then it sends out its sticky anchors, and thus comes to rest just where it has a chance of germinating favourably. Again, some seeds have a certain amount of locomotive power independent of such external agencies as wind or passing animals. I mean a power of burying themselves in the ground; the seeds of grasses are the best known of these self-burying seeds; and among them the feather-grass, or *Stipa pennata*, is the most conspicuous. These seeds possess a strong, sharp point, armed with a plume or tuft of recurved hairs, which act like the barbs of an arrow and prevent the seed from coming out again when it has once penetrated the soil. This arrow-like point is fixed at the lower end of a strong awn, which has the remarkable property of twisting when dried and untwisting when wetted. Thus the mere alternations of damp nights and dry days cause the arrow-like point to rotate, and by another contrivance, which it would take too long to go into, the point is pressed against the surface of the ground and actually bores its way into it. Fritz Müller described in a letter to me how these twisting grass seeds bury themselves in the extremely hard and dry soil of Brazil, and are thus no doubt enabled to germinate. Unfortunately these boring grass-seeds do not always confine themselves to penetrating the soil, but exercise their powers on both men and animals. I have received accounts from India and from Italy of the way in which the sharp-pointed seeds work their way through thick trousers into the legs of unfortunate sportsmen. But the most extraordinary case is that of certain grass-seeds which work their way into sheep. They often penetrate the skin deeply and in large numbers, inflicting great tortures and often causing death by emaciation. Mr. Hinde, of Toronto, has given me the details of this plague to sheep farmers as it occurs in Buenos Ayres. Another observer described it in Australia.* He states that not unfrequently

* Haberlandt, 'Schutzeinrichtungen in der Entwickelungen der Keimpflanzen,' 1877, p. 29. The idea is quoted as originally given by Sachs, *Vienna Acad.*, xxxvii., 1859.

† See 'Origin of Species,' 5th edition, p. 60.

‡ 'Haberlandt,' p. 12.

* C. Prentice, *Journal of Botany*, 1872, p. 22.

the seeds are found actually piercing the heart, liver, and kidneys of sheep which have died from the effects. I believe that the northern part of Queensland has been actually given up as a sheep country because of the presence of this grass.

Another use to which locomotion is applied by animals is that of finding a mate at the proper season. The curious imitation of the courtship of animals which is found in vallisneria is well known. The stalk grows with extreme rapidity up through the water till the female flower reaches the surface, and there awaits the approach of the male flower, which breaks loose and floats down the stream to meet her. But most plants have not even this amount of locomotive power, and are therefore compelled to employ either the wind or insects as go-betweens. Fortunately for the beauty and sweetness of our woods and fields, insect fertilization is the commonest means adopted; and all the bright flowers and sweet smells of flowers are nothing but allurements held out to insects to entice them to carry the fertilizing pollen from one flower to another. It is curious to find a plant adopting a new mode of conveying its pollen when the old one fails. Thus, a wild cabbage-like plant which grows in Kerguelen's Land is now fertilized by the wind; that is, it produces dry dust-like pollen, which is easily carried by the wind. Now this cabbage is the only species in the enormous order of the Cruciferæ which is not fertilized by insects; so that we may be certain that a change has taken place for which some sufficient reason must exist. And the reason of the change is no doubt that the insects in Kerguelen's Land are wingless, and are therefore bad distributors of pollen. And to go one step further back, the reason why the insects are wingless is to be found in the prevalent high winds. Those insects which attempt to fly get blown out to sea, and only those are preserved which are gradually giving up the habit of flying. Thus the pollen of the cabbage has to learn to fly, because the insects will not fly for it.

In considering the analogies between plants and animals, one cannot merely compare those functions which are strictly and physiologically similar in the two kingdoms. One rather sets to work and studies the needs which arise in either a plant or an animal, and then discovers in what way the same need is supplied in the other kingdom. There is no connection between a plant having bright flowers and an animal's power of walking about, yet they may, as we have seen, play the same part in the economy of the two lives.

In the life of animals the first needs that arise are supplied by certain instinctive movements. The young chicken only escapes from its egg by some such movements. Mr. W. Marshall has also shown that the chrysalides of certain moths possess instinctive movements by which they escape from the cocoon or outer case. In one case a sharp spike is developed, sticking out from the side of the chrysalis, and as the latter rotates the spike saws the cocoon all round, so that the top lifts off like a lid. Again, in young chickens Spalding has shown the existence of an instinctive power of obtaining food, and instinctive recognition of the hen by sound only. This was proved by a newly-hatched chicken, which had never heard or seen its mother, running towards a cask under which a clucking hen was hidden. The powers of growth which exist in young seedlings would certainly be called instinctive if they existed in animals, and they are quite as indispensable as those just mentioned in supplying the wants which first arise.

These two instincts are the power of directing the growth in relation to the force of gravity, and in relation to light; the first being called geotropism, the second heliotropism. As soon as the young root emerges from the seed-coats, it turns abruptly downwards, perceiving like the chick in what direction the earth, its mother, lies. Thus the young plant fixes itself firmly in the ground as quickly as possible, and is enabled to begin to make arrangements for its water supply. At the same time the young stem grows upwards, and thus raises itself as much as possible over its neighbours. The power of directing itself vertically upwards is also a necessity to the plant, because without it no massive growth like that of a tree would be possible. It would be like a child trying to build a wooden house with bricks that did not stand straight. Thus, both the young stem and the young root have an instinctive knowledge as to where the centre of the earth is—one growing towards the point, the other directly away from it. This fact is so familar to us, that we fail to think of it as wonderful; it seems a matter of course, like a stone falling or a cork floating on water. Yet we cannot even generalize the fact so far as to say it is the nature of all stems to grow up, and all roots to grow down, for some stems, such as the runner of a strawberry, have a strong wish to grow down instead of up, and side roots that spring from the main ones, though their method of growth is identical with that of the main roots, have no wish to grow downwards. We can find no structural reason at all why a root should grow down and a stem up. But we can see that if a plant took to burying its leaves and rearing its roots into the air, it would have a bad chance in the struggle for life. It is, in fact, the needs of existence which have impressed these modes of growth on the different organs of the plant in accordance with their various requirements. On the other hand, the plant is not absolutely tied down by geotropism, it is not bound to grow *always* in a vertical line, but is ready to be turned from its course if some other direction can be shown to be more advantageous. Thus Sachs* planted peas in a little sieve, and as the roots emerged underneath, they were enticed from the vertical by an oblique damp surface. This power of giving up the line of growth for the sake of a more advantageous position, must be of great service to roots, by enabling them to choose out damp places in the earth which a blind adherence to rule would have caused them to pass by.

(To be continued.)

Reviews.

EPITOME OF SKIN DISEASES. By TILBURY FOX, M.D., F.R.C.P., and T. C. FOX, B.A., M.B. Second edition. Renshaw. 1877.

Although not written to supersede "larger works" on the same subject, this little book has been correctly named an epitome, as it contains in a small compass a large amount of information on the causes, diagnosis, and treatment of skin diseases, rules for diet, and a very comprehensive "Cutaneous Pharmacopœia."

The formulæ are so important that they merit more careful revision and the adoption of more uniform nomenclature. To justify our criticism and recommendation we will take preparations of *lead* for example In formula 14 "lead water" occurs; elsewhere we find "solution of lead," "solution of subacetate of lead," and in 77 "lead." Again, in formula 48B oil of almonds is ordered: is essential or fixed oil intended? As it stands a dispenser would use fixed oil and be justified in doing so; a fault not very important possibly, yet recognizable. Formula 92 puzzles us as to the quantity of yolk of egg, as does 75 with regard to the quantity of sulphate of zinc intended. These may probably be (we conclude ʒi of vaschine is in 134) typographical errors, yet they may leave prescribers in doubt, which is not desirable. In making "iodide of starch," is it advisable "to boil together" the starch, glycerine, and water?

The "Diet for Skin diseases" with which the book concludes will doubtless prove of service and be read with interest as the expression of opinion on such a subject by such eminent dermatologists as the authors of this valuable "epitome."

* 'Text Book of Botany,' Eng. Tr., p. 764.

A GUIDE TO THERAPEUTICS. By ROBERT FARQUHARSON, M.D. ED., etc. London: Smith, Elder and Co. 1877.

The comparatively small size of this work and the absence of anything absolutely new in it might naturally lead to the inquiry, for what class of readers is it intended? An examination of the title page and a dip into its pages will soon unravel the mystery. The way in which the whole subject is condensed into as small space as possible, and, with few exceptions, rendered in simple and lucid wording, exhibits such practical knowledge as would only be attained by considerable experience as a lecturer in a medical school. The work is evidently intended as a text book for medical students and by no means as a classical work of reference. The author is well aware how necessary it is to impress upon the student the most important facts and principles. That this is the case is further proved by the arrangement of the drugs in the same order as that in which they are found in the works in materia medica, so that the two subjects can, as it were, be studied in parallel lines. The preliminary chapter on therapeutics is exceedingly valuable and should be read and re-read until thoroughly appropriated, by every student of medicine who aspires to succeed in his practice. In one point in this chapter it is, nevertheless, difficult to agree with the author. He states that in these enlightened times, "the cases are very rare in which it is necessary to conceal from patients the presence of any particular drug in their mixture." If this be so, the practice of physicians at hospitals and elsewhere is at variance with the statement. The strong common sense, however, which runs through the preliminary chapter may well be illustrated by the following quotation.

"Tablespoons, teaspoons, and all domestic measures, are absurdly variable in size, and we shall do well to steadily discountenance their use in all cases, and to insist that our patient shall carefully regulate his dose by means of those graduated glasses which are within the reach of all but the very poorest."

The way in which prescriptions are scattered irregularly throughout the work, nearly always without directions as to the special circumstances in which they should be used, appears inexplicable. Of these an example will best illustrate their apparent uselessness, at least in the way in which they are presented to the student in this work.

"℞ Tincturæ hyoscyami ♏xxx; potassæ carbonatis gr.x; syrupi papaveris ʒij; aquæ camphoræ ad ℥jss. Misce fiat haustus horâ somni sumendus. Narcotic."

This prescription follows a paragraph in which hyoscyamus has been recommended in lunacy practice, in affections of the bladder, and for cough mixture, and not long after another paragraph in which a remark has been made as to the peculiar property of fixed alkalies of acting as antidotes to the narcotic properties of belladonna, which are known to apply equally to stramonium and hyoscyamus. It must be confessed too that the heading for veratria is exceedingly puzzling, as it stands "SABADILLA, VERATRIA (THE ALKALOID OF CEVADILLA)." This, as well as the substitution of the name of Professor Attwood for Professor Attfield on p. 282, and the fact that coca, on almost the last page of the volume, is included among the substances yielding caffeine, seem to point to the author becoming a little careless as the work approached completion. The book is, however, closed with an excellent series of questions, which are not only carefully framed so as to be eminently practical and adapted to bring out as much knowledge as possible in the answers to them, but are highly suggestive of the directions in which the student should prosecute his reseaches. The medical student who has but limited time at his command and who wishes to acquire a practical knowledge of therapeutics will do well to peruse carefully this work before entering upon such classical treatises as Ringer's or Bartholow's, or Wood's.

Dispensing Memoranda.

[80]. I should have ventured to have answered this last week, but was in hopes of some one kindly suggesting a better way, at least one that would do away with the large amount of trituration that this ointment undoubtedly requires to ensure success. I have made large quantities of this ointment, from the fact that Professor Lister's antiseptic treatment is practised at this hospital, and seemingly with great success. I make it thus: First dissolve the wax and block paraffin in the almond oil; then transfer to a mortar "previously warmed;" then add the boracic acid finely powdered and rub well together for some time until it presents somewhat the appearance of whipped cream; then transfer to a cold mortar in pieces of about an ounce at a time and continue the trituration until a smooth ointment is formed, which I generally succeed in producing in appearance like the zinc ointment of the B. P. This ointment will keep good any length of time.

J. A. CULFE.

Ipswich.

[80]. If "Quærens" will rub the Boracic Acid with a few drops of Spt. Vini Rect. to reduce the acid to a fine powder he will have no difficulty in preparing a smooth ointment with his recipe.

I also send the following formula, which is easily and quickly prepared, and answers its purpose:—

℞ Acid. Boracic. . . . . . 1 part.
Spt. Vini Rect. . . . . . q.s.
Adipis Præpar. . . . . . 5 parts.

T. WALTON.

[84]. NERVINE BALSAM.—In answer to "Spes'" inquiry, I beg to enclose him formula for "Nervine Balsam":—

℞ Oil of Mace . . . . ℥iv.
Beef Marrow . . . . ℥iv.
Melt and add—
Oil of Rosemary . . . . . . ʒij.
Oil of Cloves . . . . ʒj.
Balsam of Tolu . . . . ʒij.
Camphor . . . . ʒj.
Dissolved in—
Spt. Rectif. . . . . ʒiv.

"AN ASSOCIATE."

[84]. NERVINE BALSAM.—

Beef Marrow . . . . ℥4 } melt.
Oil of Mace . . . . ℥4 }
Balsam of Tolu . . . . . . ʒij.
Oil of Cloves . . . . ʒj.
Camphor . . . . ʒj } dissolve.
Spt. of Wine . . . . ℥ss }

M. S. A.

[84]. NERVINE BALSAM.—In answer to "Spes" I beg to hand the following recipe for Nervine Balsam—

℞ Beef Marrow, Expressed Oil of Mace each ℥iv.
Balsam of Tolu . . . . ℥ij.
Oil of Cloves, Camphor . . . . each ʒj.
Rectified Spirit . . . . ℥ss.
Mix.

Nottingham. W. W. TALBOT.

[85]. Extract of Gentian, if of soft consistence, will be suitable. It would have been better if a copy of the prescription had been given, the size of the pills being intimately connected with the excipient required.

WM. DUNCANSON.

[85]. Glycerine Mucilage to soft consistence.

J. B. L. M.

[87]. I should imagine the first dispenser read the number as xvi. instead of vi.; at least this would account for the size.

J. B. L. M.

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[88]. GLYCERINE OF BELLADONNA.—

℞ Glycerini . . . . ℥ss.
Ext. Belladonnæ. . . . . ʒj.

Misce.

It should form a thin paste. ℥iss of the belladonna is sometimes used. Triturating the extract with a very few drops of water before adding the glycerine will facilitate the combination.

WM. DUNCANSON.

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[88]. GLYCERINE OF BELLADONNA.—In reply to Mr. Cleland's inquiry two formulas are given in Squire's 'Pharmacopœia of the Hospitals,' either of which I presume may be termed "Glycerinum Belladonnæ."

The formulas are

1st. Extract. Belladonnæ . . . . . . ʒj.
Glycerini . . . . ʒiv.

This is the London Ophthalmic Hospital formula.

2nd. Extract. Belladonnæ,
Glycerini, āā partes æquales.

This is the Middlesex Hospital formula.

AN ASSOCIATE.

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[88]. GLYCERINE OF BELLADONNA.

℞ Ext. Belladon.,
Glycerini, partes æquales.

Misce bene.

JOHN W. TINDALL.

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[88]. GLYCER. BELLADONNÆ is made of different strengths, the most useful being one part of Ext. Bellad. rubbed smooth with three parts of glycerine.

THOMAS WALTON.

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[88]. GLYCERINE OF BELLADONNA.—In reference to this query in the Journal of 23rd inst., I shall be glad if you will insert the following answer.—At University College Hospital we use a preparation of glycerine and belladonna which is made as follows—Extract of Belladonna 4 parts, to which is added 1 part of water. This being rubbed into a smooth paste an equal quantity of glycerine is added. The water is added to satisfy the hygroscopic action of the glycerine, as if no water be added it is rather troublesome to get the preparation of a smooth consistence.

H. J. PAVEY, *University College Hospital.*

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[91]. The rosewater has absorbed carbonic acid, which is the cause of the turbidity of the mixture. In making distilled water I reject all that does not stand the test of liquor plumbi diacet.

GEORGE THOMPSON.

Alston.

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[91]. If freshly distilled rosewater free from carbonic acid be used, and the lead solution likewise be clear, the resulting lotion would be free from opacity or precipitate.

J. B. L. MACKAY.

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[92]. Will you kindly insert the following prescription in the next issue of the Journal under "Dispensing Memoranda"?—

℞ Magnesiæ . . . . ʒj.
Aquæ Anisi . . . . ad ℥vj.
Spirit. Ammon. Aromat. . . . ʒij.
Tinct. Card. Co. . . . . . . ʒij.
Chlorodynii . . . . gtt. xx.

M. Capiat cochl. ampl. ij. bis. in die.

In dispensing the above, which B. P. preparation of magnesia would be the correct one to use?

T. F. E.

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[93]. How can I dispense the following prescription which may be called "A Puzzle"?

℞ Potassii Iodidi . . . . ʒij.
Ext. Cinch. Flav. Liq. B. P.
Aquæ . . . . āā ℥iss.

M. Capiat coch. min. j. bis die c. aqua.

I have tried several methods, but find in every case I fail, for directly the pot. iodid. is added the bark separates and sticks to the side of the bottle, and violent shaking has no effect upon it; in fact I gave it up as a bad job, besides spoiling three ounces of ext. cinch. flav. liq. Perhaps some of your readers can enlighten me. I used aq. destill.

30, *Highbury Park.* FREDK. HEATH.

Notes and Queries.

[578]. HOPGOOD'S SEDATIVE OINTMENT.—Can any one inform me what the formula for this is?

WM. DUNCANSON.

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[579]. Can any of your readers kindly give me the formula for making Mist. Ferri Comp. Conc. so that one drachm of solution with two and a half grains of Ferri Sulph. shall be equivalent to one ounce of Mist. Ferri Comp., B.P. I have obtained preparations from two different wholesale houses; one sends me a thick solution to make it with, the other a clear one—which is correct?

BETA.

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[580]. SAFFRON PASTE.—Will some reader kindly give information concerning Saffron Paste, its nature, its value, and its uses?

HARVEY, *Margate.*

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[581]. IRISH SLATE.—Will any of your English correspondents say what is supplied when "Irish Slate" is asked for?

W. L.

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[582]. ESSENCE OF GINGER.—Will you kindly inform me through the medium of the Journal the best method of making Gingerade with Essence of Ginger without rendering it turbid?

F. W. ANDREW.

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[583]. CELLAR LABELS.—Can any reader suggest a reliable Label Varnish for ordinary written labels for cellar stock, to prevent damping and falling off?

Stony Stratford. H. J. W. COX.

Obituary.

Notice has been received of the death of the following:—

On the 9th of March, 1878, Mr. Charles George McCarthy, Chemist and Druggist, Cardiff. Age 43 years.

On the 21st of March, 1878, Mr. George Hick, Pharmaceutical Chemist, Bradford, Yorkshire. Age 26 years. Mr. Hick had been a Member of the Pharmaceutical Society since 1872.

Correspondence.

**** No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Patent Medicines.

Sir,—I was glad to see three letters in the last week's issue having reference to the sale of patent medicines. I think it is high time the vast body of chemists and druggists were bestirring themselves in the matter, and getting the sale of patent medicines confined only to persons who are on the register. That a licence costing only 5*s.* can be obtained by any person who chooses to apply for it, thus enabling him to sell medicines containing poisons, ought not any longer to be allowed, as it not only robs us of what is the legitimate right of a qualified and registered chemist, but also materially interferes with our returns.

As to the scandalously low prices which grocers and drapers charge for patent medicines, the practice is too well known to need any remarks from me.

In these days of competition and great depression in trade it behoves us to look very sharply after our interests, for what with Adulteration Acts, etc., we are harassed more than our position (since the passing of the Pharmacy Act) justifies. In conclusion, let us bear in mind that "Unity is strength," and try our utmost to get the excise authorities to refuse to grant patent medicine licences to unqualified persons

"Tento."

Discrepancy of Examination Results.

Sir,—Will you allow me, through the medium of your columns, to promulgate a few remarks upon the above subject.

I thoroughly indorse and concur with the letter by Mr. Boa which appeared in your last issue.

The Preliminary is essentially an elementary examination; the questions asked are evidently selected with this object in view, and nothing is required but what should and ought to be forthcoming from every would-be student of the Society. Apropos of the subjects for examination, I think these were fully and sufficiently explained and treated upon by Mr. Boa, and therefore need no additional remarks of my own.

I have it upon most reliable authority that a youth who has passed his respective standards at a national school, or at any other school under the new Educational Code, would pass readily and most satisfactorily both in the English and the arithmetic required for the Preliminary. The Latin, as previously shown by Mr. Boa, is a minor consideration, and would not involve the expenditure of very much time in preparing for it.

The following came under my cognizance a year or two ago. A youth educated at a middle-class school, who had a moderate general knowledge, together with a slight groundwork of Latin, but had never read an author, after having left school two years, during which time all studies were neglected, prepared for one month only, presented himself for examination, and passed creditably.

Obviously, the standard is not so high that the requirements are not within the reach of any ordinary student, consequently there are no grounds to warrant the lowering of it.

"Examination" is universally acknowledged to be a very inefficient and insufficient test of knowledge and education, notwithstanding there are those who not only do not scruple to avail themselves of the advantages afforded by its deficiencies, but also wish to dishonourably augment the general defects by proposing that the standard be lowered (no personal allusion is here made to any previous letter writer). Such a procedure would be irrational and *mal à propos*, egregiously incompatible to all sound sense, and an irreparable wrong to the pharmaceutical community at large.

If persons desirous of becoming chemists fail to see the necessity for adopting some fair and sensible standard, or find themselves incompetent to pass the necessary examinations, let them quietly withdraw from the "chemical world" and not disturb the general peace by superfluously complaining about such trivialities.

Sutton-in-Ashfield. George Daubeny.

The Election of Council.

Sir,—It has been my privilege to vote at recent elections of the Council of the Pharmaceutical Society. Under the existing plan I think it more than probable that I have each time voted for some candidates who entertain different views from myself on various subjects of interest to myself and chemists generally, to obviate which I propose that each candidate should issue a short address stating the principles he intended advocating if elected. The addresses might be issued on one sheet as a supplement to the *Pharmaceutical Journal*.

A Provincial C. and D.

Note on Boa-tam-paijang.

Sir,—In a note in the last issue, Mr. J. R. Jackson points out that this drug is the seed of *Sterculia scaphigera*, Wallich., and implies that this fact was not known to the late Daniel Hanbury, apparently having overlooked Mr. Hanbury's paper in the *Pharmaceutical Journal* (2nd series), vol. iv., p. 106, which is also copied into 'Science Papers,' pp. 289, 290. In the 'Hist. des Drogues,' 6ième ed., vol. iii., p. 646, published in 1869, it was also referred to *Sterculia scaphigera*, Wall.

The identification of the drug appears to be due in the first place to M. Decaisne, who requested, in May, 1862, the late Daniel Hanbury to compare it with the above-named plant. In the Hanbury herbarium, now in the possession of the Pharmaceutical Society, is a specimen of the leaves of the seedling plant raised at Bangkok by Sir R. H. Schomburgk in 1859, and a seed with the large leafy follicle attached, accompanied by a letter from the late Dr. A. O. Black, bearing date Royal Gardens, Kew, May 19, 1862, and stating that the seed, with follicle attached, was one of Mr. Griffith's specimens from Malacca. It would thus appear that on receipt of M. Decaisne's letter Mr. Hanbury at once compared the drug with the herbarium specimens at Kew, and, being convinced of their identity, published the note above alluded to in the *Pharmaceutica Journal* in August, 1862. E. M. Holmes.

A Correction.

Sir,—Will you allow me to correct an error made by the compositor in setting the type for my letter bearing on the examinations in last issue? I refer to p. 763, col. i., lines 35 and 40 from top, where what I penned as "Mr. S——" has been inserted as "Mr. Schacht."

James B. L. Mackay.

D. A.—See an answer to a similar question in vol. iv., p. 1011 of the present series of this Journal.

"*Neglected.*"—You are recommended to consult the Secretary, 17, Bloomsbury Square.

W. Blain.—You are mistaken in supposing that the regulations concerning the examinations are kept "'neath a mystic covering," since they are printed in the published Calendar of the Society, besides which we believe a copy of the Regulations is supplied to any person making a proper application for one to the Secretary.

J. B. L. M.—We believe the publication is only partial. You could obtain the information from the Librarian of the Institution.

"*Dispenser*" is thanked for his communication.

"*Exposition.*"—The office of the *Moniteur de la Pharmacie* is at 6, rue Git-le-Cœur, Paris.

A. P. S.—Apply to the Secretary, 17, Bloomsbury Sq.

"*Aberdonia.*"—Strictly speaking there is a difference, but the two terms are frequently used to designate the same substance, as in the case of the ordinary chloral hydrate.

T. H. North.—The formula of the preparation has not come under our notice; perhaps the maker might give you the information you ask for.

"*Oleum.*"—We cannot find in the Petroleum Act any such provision as that described by you.

"*Member of the Pharmaceutical Society.*"—The fi meeting was held at the Crown and Anchor on the 15th February, 1841.

A. Billington.—A letter addressed to the Company at Newcastle-on-Tyne would reach them.

Communications, Letters, etc., have been received from Mr. Hardwick, Mr. Hick, Messrs. Hogarth, Mr. Hudson, Professor Landerer, Mr. Troughton, Mr. Andrews, An Assistant.

NOTE ON SALICYLIC ACID.*

BY JOHN WILLIAMS, F.C.S.

Having had occasion during the past few months to prepare some quantity of salicylic acid from the natural source, namely, the oil of wintergreen (*Gaultheria procumbens*), an oil of American origin, and much used as a scent in the United States, I have been led to make some practical observations on this acid, which, although still very incomplete, I will venture to lay before the Society.

Salicylic acid is now so extensively made by the artificial process discovered by Professor Kolbe, and has proved of so much importance both in medicine and the arts, that the comparison of the natural acid with the artificial, tending as it must to throw light upon the real nature and purity of the artificial article, is a matter of great interest, not only to members of the Pharmaceutical Society, but to the medical profession and scientific chemists generally.

It is not my intention to give any account of the chemical constitution or properties of the acid; that has been done so well and so fully by others, and reported in our Journal, that I shall not take up the time of the meeting by entering into any details of that nature.

The oil of wintergreen is, as is well known to chemists, mainly composed of salicylate of methyl, a natural combination of salicylic acid and methyl alcohol (or wood naphtha); it is accompanied in the oil by a small quantity of another essential oil, not acted on by caustic alkalies, and possessing a very pronounced and characteristic odour, not at all like the wintergreen oil from whence it is derived.

When the wintergreen oil is treated with a solution of caustic potash and distilled the compound salicylate of methyl is decomposed, the salicylic acid uniting with the potash, while the methyl alcohol, together with other volatile matters, distil over. The salicylate of potash thus produced is decomposed by hydrochloric acid, which precipitates the very insoluble salicylic acid; this is subsequently recrystallized several times from boiling water, treated with pure animal charcoal, and finally recrystallized from weak spirit (one part of alcohol to four or five of water); in this way the acid is produced in fine crystals, large, white, and distinct. The methyl alcohol which has been distilled over in the first part of the process can be recovered and purified; it must be largely diluted with water to separate the neutral oil, then filtered several times through charcoal to remove the last traces of that oil and afterwards rectified, and finally distilled from dried carbonate of potash, and, if required absolutely anhydrous, from fresh quicklime. In this way methyl alcohol is obtained quite free from the empyreumatic flavour which is generally associated with the idea of naphtha! Samples of the salicylic acid, the methyl alcohol, and the undecomposable essential oil are on the table.

The artificial salicylic acid is made from carbolic acid; and in very few words, for the benefit of the younger portion of those present, I will give an outline of the process, which is one, I may add, of very great interest to chemists from a purely scientific point of view, as well as important in a commercial sense.

Simply stated, the process consists in uniting carbolic acid with soda to form a neutral salt. This is subjected to a temperature of about 200° C. when a current of dry carbonic acid is passed through it. Half the carbolic acid united to the soda combines with the carbonic acid to form salicylic acid, which remains united with the soda, the remainder of the carbolic acid distils off. The resulting rough salicylate of soda is decomposed by hydrochloric acid, and the salicylic acid thus separated purified by suitable recrystallizations.

It is a remarkable fact that if potash be substituted in the above process for soda, no salicylic acid is produced, but another closely allied body, named paraoxybenzoic acid, is the result; this acid is described as being very different in its chemical properties to salicylic acid and is stated to be quite inert as an antiseptic.

When we consider the nature of this process we readily see that there are many practical reasons why the resulting product should not prove uniform, and that it is very necessary to check the result by comparing it with what we know ought to be obtained.

In the first place, the carbolic acid employed is a body of very varying constitution. We know it is offered commercially of very different melting points, due to the proportion of cresylic acid contained in the sample and also at very different prices, according to the quality. Being a product of coal tar it cannot, without great difficulty, be obtained absolutely pure, and if it could the price would be too high for its use for the purpose of making salicylic acid artificially. The ordinary carbolic acid being thus a mixture of that acid and cresylic acid, and probably other bodies, it is quite natural that the salicylic acid produced from such a mixture should vary much in quality. There is another source of impurity in the difficulty of perfectly purifying the salicylic acid from the last traces of what I may call carbolic residue. It is true the acid may have no perceptible smell of carbolic acid, but I have been given to understand that when given internally frequently great pain and irritation in the stomach are produced, which is not the case when a perfectly pure acid is administered.

Now, again, when we compare the physical and chemical properties of the artificial acid with the natural, made from wintergreen oil, we are much struck with a great difference in appearance, and when we proceed further to subject the two to comparative chemical tests we discover still stronger indications that the two substances are not in every respect identical. Different samples of the artificial acid, as imported from abroad (mainly Germany), differ considerably in colour and appearance; some samples are brownish powders, still clearly possessing the characteristic carbolic acid smell; others are white and without smell. The best samples I have seen are fairly white, free from smell, and crystalline, but the crystals when compared with the crystals of the natural acid are very different, being quite small and indistinct.

I intend in the present note to limit my remarks mainly to better qualities of the artificial acid; the lower qualities need hardly occupy our time, as they are obviously not suited for any medicinal purpose, and should, I should say, hardly be employed in the arts.

If we attempt to recrystallize this crystalline artificial acid we fail in getting it to crystallize like the natural acid, even when the conditions are apparently

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, April 3, 1878.

exactly alike, the artificial still giving small and confused masses of crystals, and if the beaker in which the crystallization is proceeding be watched, it will be observed that the crystallization assumes different appearances as the liquid cools, the first crystals appearing much more needle-like than those deposited when the liquid becomes cooler. Crystallization from chloroform also fails to give the two acids an identical appearance.

It is a very instructive experiment, and I think teaches us a great deal as to the comparative purity of the samples of acid we are examining, if we take a known quantity, say one drachm, and observe what is the smallest quantity of boiling water capable of dissolving it. A drachm of the pure natural acid will be found to require just about three ounces of boiling water, the best quality of artificial (crystalline) acid about two ounces, very low qualities will frequently only require one-and-a-half. Now if to these hot saturated solutions about one-fifth of alcohol is added, and the liquids allowed to cool in beakers, we shall find that the pure natural acid will crystallize in separate distinct crystals, not cohering together; the best artificial in a fine network of needle-shaped, but very small, crystals, from which the mother liquor can be drained by simply inverting the beaker. The lower grades of artificial acid form a woolly looking mass of very small and indistinct crystals, which refuse to allow the mother liquor to drain from them, but hold it like a sponge. The mother liquor can, however, be absorbed from the mass by blotting paper and thus a dry white woolly like mass eventually obtained. I place samples of these results on the table; it will be observed how different in appearance are the various products.

I have also investigated the action of sulphuric acid upon these various qualities of salicylic acid; very different results were, as might be expected, obtained from the various samples. It is not, however, my intention to call further attention to this part of the subject at present.

The general result of my experiments to this point was to cause me to have considerable doubt as to the actual identity of the artificial with the natural salicylic acid, but further experiments now in progress are sufficiently advanced to allow me to clear up the difficulty and to prove that the artificial acid as supplied in commerce is really made up of two bodies having very different properties, and that when these two substances are separated all difficulties vanish.

To break up the artificial salicylic acid of commerce into its constituent parts, I have had recourse to the following process. The acid is dissolved in boiling water, and carbonate of lime added to neutralization. As the solution cools, the sparingly soluble salicylate of calcium is deposited; if the acid employed was of fair quality the crystals formed are pretty distinct and of light colour; if of low quality the crystals are very brown and indistinctly formed. The crystals of salicylate of calcium thus produced must be recrystallized several times from boiling water until they are white or nearly so and in hard well defined crystals, the salt decomposed with hydrochloric acid, and the salicylic acid thus produced purified by recrystallization and final crystallization from weak alcohol as described in the process for making the natural acid. Thus purified the artificial acid is obtained in large white well formed crystals absolutely identical in appearance with the natural acid, and as far as I can at present ascertain agreeing in every respect with it. For instance the salicylate of soda produced from the natural acid crystallizes in large pearly plates, very different in appearance to the salicylate of soda made from artificial acid usually employed in medicine. The soda salt of this purified artificial acid is also in white platy crystals, exactly like the salt produced by the natural acid both in appearance and taste.

By further concentration the mother-liquor from which the salicylate of calcium is obtained yields further quantities of crystals, consisting of salicylate of calcium in a very impure state; the final brown nearly uncrystallizable mother-liquor when decomposed with hydrochloric acid yields a large quantity of an acid quite distinct from salicylic. In appearance and in many of its properties it differs very much, and at one time I thought it must be paraoxybenzoic acid; but upon closer examination it proved to differ from the description of that acid. I am, at present in doubt as to its real nature, and am still investigating the matter and hope to be able to give a more perfect account of it in a short time. In the meantime I may state that when purified and crystallized in the same way as salicylic acid it crystallizes in silvery plates. It is much more soluble both in hot and cold water than the salicylic acid, but much less soluble than paraoxybenzoic acid is stated to be. Its solution with perchloride of iron does not give a yellow precipitate, characteristic of paraoxybenzoic acid, but still gives the so-called characteristic reaction of salicylic acid, but this may be due to my not yet having obtained the acid quite free from salicylic, and owing to the short time I have had this acid in my possession I cannot at present enter more fully into its characters. I place a specimen of it on the table, and would suggest that, as it is probably derived from cresylic acid, we might name it cresyl-salicylic acid, at any rate until a better name is found for it.

The quantity of this second acid contained in the various samples of commercial salicylic acid made by the artificial process, appears to vary considerably, but it is present in somewhat large quantities. I have not been able as yet to obtain anything like accurate results as the waste of working is very considerable, but I think from 15 to 25 per cent. may probably be taken as the proportion. Respecting the medicinal properties of this acid, I can say nothing as yet; it may be like paroxybenzoic acid inert, and would then be simply a diluent of the salicylic acid, or it may be active as an antiseptic, or it may be mischievous; whatever it be there can, I think, be no doubt that the artificial salicylic acid at present used for medicinal purposes is not as pure or as uniform as is desirable, and that it should be more highly purified and freed from this second acid I have described before it or its salts are used in medicine.

Before concluding, I may mention that if instead of carbonate of lime being used, and the liquid thus kept neutral, milk of lime is employed in excess, so as to render the liquor highly alkaline, nearly insoluble calcium salts are deposited, and the two acids cannot be separated by the fractional crystallization of their basic salts; the neutral salt of the cresyl-salicylic acid on the contrary is extremely soluble as described.

I cannot conclude this note without expressing my thanks to my friend Mr. Myles Smith, to whose suggestions and assistance I have been much indebted in carrying out the experiments detailed in this note.

[*The discussion on this paper is printed at p.* 796.]

NOTE ON GRINDELIA ROBUSTA.*

BY E. M. HOLMES, F.L.S.

Curator of the Museum of the Pharmaceutical Society.

In the report of the Pharmaceutical Meeting, at Philadelphia, on January 15th, Professor Maisch states that he had been examining commercial specimens of *Grindelia robusta*, and that he concluded that three species were sold under that name, much of it being *G. squarrosa.*

It therefore occurred to me that the specimens imported into this country would probably be found similar in character to the American drug and might be worth examination. I have, therefore, compared the specimens which have been presented to the Museum with the specimens in the Herbaria at the British Museum and at Kew, and with such descriptions of the species as have been published recently, and find that the drug as imported into this country is not *Grindelia robusta*, Nutt., but *G. squarrosa*, Dunal.

The genus *Grindelia*, according to Asa Gray, is one which is characteristic of the plains west of the Mississippi, extending to the Pacific coast and to Mexico, with two or three species in similar regions in South America. They are, however, most abundant in Mexico and Texas. The chief distinguishing character of the genus lies in the pappus, which consists of from two to eight rigid awns that a touch is almost sufficient to break off, and which in fact fall off early.

The species are very intricate, and run so much one into the other through a variety of forms that it is difficult to say how many of them have a right to that distinction. Consequently it is a difficult matter to define any good character by which the species may be distinguished. Those which have been chiefly relied on in describing these plants have been the shape and serration of the leaves, the character of the scales of the involucre, and the number of the awns of the pappus. The latter character is, however, of little practical value, since the number is variable in the same species, and the flowerheads are usually so resinous that it is difficult to examine a dried specimen without the pappus falling off.

The species which seem to possess this resinous matter, upon which it may be presumed the active properties of the plant depend, and which are most likely to be met with in commerce, are *G. squarrosa*, Dunal., *G. rubricaulis*, Dec., *G. robusta*, Nutt., *G. integrifolia*, Dec., *G. inuloides*, Willd., and *G. glutinosa*, Dunal. For pharmaceutical purposes these may be roughly distinguished as follows: *G. squarrosa* has leaves which are narrowly lanceolate, tapering downwards to a small cordate base, so that the upper portion of the leaf is the broadest, and the scales of the involucre are subulate, and strongly curled backwards. In *G. robusta* the leaves are oblong, broadest at the base, nearly twice the width of *G. squarrosa*, and obtuse at the apex; the scales of the involucre are similar to those of *G. squarrosa*, but are less squarrose. *G. integrifolia* has the leaves entire or very sparingly serrated, with the leaves longer and more tapering at the apex than those of *G. robusta*, which it otherwise resembles. *G. inuloides* is a very well marked species, the flowerheads being almost immersed in large leafy bracts so that they have a sessile appearance; the leaves are nearly as broad as those of *G. robusta*, oblong, and much wider near the base, and are furnished with short closely set teeth, which are more obtuse than in the other species. *G. glutinosa* has lanceolate leaves, broader than those of *G. squarrosa*, also tapering to the base, but the scales of the involucre are linear, with a short point, and are not bent backwards but erect. *G. rubricaulis* is easily distinguished by the hairiness of the involucre and purplish stem, and by the uppermost leaves being larger at the base, while the lower leaves taper towards the stem. It is this last species which, under the name of *G. hirsutula*, is mentioned in Wood and Bache's 'Dispensatory' as a remedy for the irritation caused by the poison of *Rhus Toxicodendron.*

The amount of resin developed in the plants appears to vary according to the situation in which the plant grows, those which are found in hot dry places being apparently most resinous.

Although it is probable that the resin does not differ in properties in the various species, it is at least satisfactory to know that although the one to be met with in commerce in this country is not *G. robusta*, it is quite equal to that species in the amount of resin it contains, and indeed appears to be one of the richest in medicinal properties of the whole genus.

[*The discussion on this paper is printed at p.* 797.]

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, April 3, 1878.

THE ALKALOID AND ACTIVE PRINCIPLE OF DUBOISIA MYOPOROIDES.*

BY A. W. GERRARD, F.C.S.,

Teacher of Pharmacy, University College Hospital.

The natural order in which the above named plant has been placed (Solanacæ), and its powerful physiological action, especially in dilating the pupil of the eye and causing dryness of the mouth and thirst, are facts which when considered together lead at once to the inference that its activity must be due to an alkaloid having properties in common if not identical with atropine. The drug having come somewhat prominently under my observation through my having made the preparations referred to in Drs. Ringer and Tweedie's paper on duboisia in the *Lancet* of March 2, and having heard Mr. E. M. Holmes's paper read before the Pharmaceutical Society, on March 6, I felt desirous to investigate it closely but the material at my command was insufficient to carry on a research for its active constituent, until through information conveyed me by Mr. Holmes I was able to obtain supplies of the extract.

The extract I received proved upon examination to be an aqueous one, and was submitted to the following treatment: one thousand grains when thinned by the addition of an equal volume of water were treated with alcohol till no further precipitation occurred; the alcoholic solution was filtered and the insoluble matter washed with alcohol; the alcohol was now distilled off and the residual extract diluted with a small portion of water, treated with ammonia in slight excess, and shaken with chloroform; the chloroform separated and distilled yielded a varnish-like residue having a powerful alkaline reaction. By re-solution in dilute sulphuric acid and addition of ammonia a dull grey precipitate was produced, imme-

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, April 3, 1878.

diately aggregating into oil-like drops heavier than the mother-liquor. The alkaloid was finally abstracted with ether, which yielded after evaporation 21 grains. The alkaloid appeared as a yellow viscous mass freely soluble in alcohol, chloroform, ether, benzol, and carbon bisulphide, fairly soluble in water, and imparting to it a decided alkaline reaction; solutions of the alkaloid in the preceding solvents upon spontaneous evaporation yielded no crystals. A portion of the new alkaloid converted into sulphate and treated with various reagents was found to give reactions so similar to atropine that I determined to test it side by side with that alkaloid, the better to observe their relations and differences.

Both duboisia alkaloid and atropine gave white precipitates with tannic acid and iodohydrargrate of potassium, those with tannic acid being soluble in hydrochloric acid. Hydrates of potash, soda, and ammonia gave white precipitates with both, soluble in excess; chloride of gold and perchloride of platinum yielded lemon-yellow precipitates; a common characteristic of the preceding precipitates was that they rapidly formed conglomerate masses. Neither sulphocyanide of potassium nor perchloride of mercury gave precipitates, unless with the latter reagent when the alkaloidal solutions were concentrated. Strong nitric acid causes no visible change with atropine, but with duboisia alkaloid a very slight brown colour is produced. With strong sulphuric in the cold, atropine remains unaffected, but on heating the mixture it darkens, evolving a pleasant aromatic odour which the addition of bichromate of potash intensifies, and at the same time yields a green precipitate of oxide of chromium and vapours of an acid reaction. Duboisia akaloid in contact with sulphuric acid behaves differently to atropine. In the cold it gives a reddish-brown colour, and when heated an odour unpleasant and suggestive of butyric acid; upon the addition of bichromate of potash no reduction of the chromium to its oxide was apparent, but the evolved vapour was of acid reaction.

Both duboisia alkaloid and atropine, when heated between watch glasses, partly volatilize, condensing as transparent varnishes; both their salts dissolve easily in alcohol and water, but with difficulty in ether.

I prepared small quantities of neutral solutions of sulphate, chloride, nitrate, phosphate, acetate, hydrobromide, and tartrate of duboisia alkaloid upon watch glasses, and left them to evaporate spontaneously; only in the case of the sulphate and hydrobromide were a few tufts of needle-like crystals observable. The material at my disposal did not admit of further attempts to obtain it crystalline. The neutralizing power of dilute sulphuric acid upon the new alkaloid was tested side by side with atropine, and found to be thus: two grains of new alkaloid required four drops of the acid, whilst the same quantity of atropine required three drops.

As no individual reaction which specially distinguishes atropine from other alkaloids had been applied to the duboisia alkaloid one was sought for with that object. I found in Gmelin's 'Chemistry,' vol. xvi., it is stated by Hinterberger that an alcoholic solution of atropine assumes a blood-red colour when cyanogen gas is passed through it. I have twice repeated the experiment, passing the gas ten minutes through the atropine solution, but no colour change whatever was observable; it was therefore useless to apply this test, and I conclude that the statement of Hinterberger must be an error.

Again, Selmi, in the *Gazetta Chimica Italiana*, vi., 155,* mentions that atropine boiled with barium hydrate in contact with air gives a pleasant odour of hawthorn flowers. Portions of atropine and duboisia alkaloids were treated with barium hydrate and boiled; the odour evolved by atropine was pleasant but rather more suggestive of oil of gualtheria than hawthorn, whilst the odour evolved by duboisia alkaloid was unpleasant and altogether different to the atropine odour. After a search through many chemical works I failed to find any other reactions of atropine worthy of a trial, and it is a matter for regret that chemistry should be at a loss for a reaction to indicate with certainty this powerful poison.

It being desirable to obtain physiological properties of the new alkaloids, Dr. Sydney Ringer and W. Murrell undertook the work, and to them I am indebted for the following notes:—

Physiological Action of the Alkaloid of Duboisia.

BY SYDNEY RINGER AND WILLIAM MURRELL.

Action on the Eye.—We find that it quickly and widely dilates the pupil. Mr. Blake dropped a small quantity of a solution, 1 in 120, into an eye. In ten minutes the pupil was widely dilated.

Action on the Skin.—Mr. Blake injected one-sixtieth of a grain under the skin of a patient troubled with night sweating. The sweating was much prevented.

Effect on the Mouth.—Mr. Blake injected one-sixtieth of a grain hypodermically into two patients. The injection caused great dryness of the mouth.

Antagonism to Muscarine.—We find also that like atropia it antagonizes the action of muscaria on the heart of a frog. We exposed the heart of a brainless frog, and applied a minute quantity of extract of aminita muscaria. The heart-beats had nearly stopped in five minutes, there occurring only an occasional pulsation. We then applied a small quantity of solution of the duboisia alkaloid, one in twenty, and in half a minute the heart beat strong and naturally thirty-four per minute.

Tetanizing Property.—Like atropia also this alkaloid produces tetanus after the lapse of some hours or days. We injected one-seventh grain, one-fifth grain, and one-seventh grain respectively, under the skin of three frogs. Slight but distinct tetanus occurred in two in twenty-four hours.

The preceding experiments show that in its physiological action duboisia alkaloid entirely agrees with atropine, but this agreement by no means proves that alkaloid to be atropine, for most alkaloids of the order Solanaceæ have common physiological actions, and at one time were considered to be chemically identical, but now they are generally understood to be different bodies, and although it has been shown that in the majority of its properties this duboisia alkaloid is like atropine, I am inclined, for the following four reasons, to the conclusion that it is not atropine:—

1st. Its solubility in water is twice or more than twice that of atropine.

2nd. It has more power in neutralizing acids than atropine.

3rd. Its behaviour to sulphuric acid in the cold,

* An abstract of Selmi's paper is contained in the 'Year-Book of Pharmacy,' 1877, page 114.

and also when heated with bichromate of potash, differs from the behaviour of atropine.

4th. When boiled with baryta the odour it evolves is entirely different to that given off by atropine under the same conditions.

I have submitted to Dr. Paul a quantity of this new alkaloid, and he has been good enough to undertake its examination; when this is accomplished perhaps a definite conclusion can be arrived at as to the name it shall bear. If it does not prove to be atropine, following the usual rule, it should be called duboisine; meantime it must remain an alkaloid without a name.

In conclusion, I think medical men and pharmacists in Australia may congratulate themselves that they have at their disposal, provided the supplies of the plant are abundant, a source from whence to obtain by the simple process I have here given a therapeutic agent of great value.

[*The discussion on this paper is printed at p.* 797.]

LIQUOR FERRI, PEROXYCHLORIDE OF IRON, DIALYSED IRON, CATALYTIC IRON.*

BY EMIL SCHEFFER.

The different views regarding the composition of dialysed iron, of whose preparation a great deal has been written in our periodicals for the last twelve months, induced the writer to make a series of experiments which will no doubt throw some light on the subject and also show the relation of peroxychloride of iron, dialysed iron and catalytic iron.

By precipitating a solution of ferric chloride with ammonia, the precipitate differs according to the quantity of ammonia used as precipitant. Ammonia added as long as a precipitate is formed yields an oxychloride, and the liquid above the precipitate has *acid* reaction. Ammonia added carefully until the supernatant liquid has become perfectly *neutral* produces a more basic oxychloride. Ammonia added *to excess* yields a precipitate free from chlorine, but containing ammonia. Of these three precipitates the first two are soluble in water, the third is insoluble.

In the following experiments 300 c.c. of the officinal ferric chloride solution were diluted with water to 1500 c.c., and 150 c.c. of this dilute solution were taken for each experiment. The ammonia was also diluted with water, but spec. grav. was not taken, as it was not deemed necessary.

a. To 150 c.c. of the dilute ferric chloride solution dilute ammonia was added, in small quantities at a time, to saturation, that is, to the point at which a further addition of ammonia produced a permanent precipitate. To effect this, 81·3 c.c. of ammonia were required; the smallest quantity of ammonia added now produces a copious precipitate, and on an addition of 1·7 c.c. more, or about two per cent. of the quantity needed for saturation, all iron was precipitated, while the clear, colourless liquid above the precipitate showed acid reaction.

The same experiment was repeated, but to the mixture obtained after the addition of respectively 81·3 and 1·7 c.c. of ammonia, ammonia was added to perfect neutralization of the supernatant liquid, 6 c.c. being required, making the total of ammonia 89 c.c. Although the liquid is perfectly neutral, the precipitate is not pure ferric oxide, but contains still a considerable quantity of chlorine.†

The precipitate of *a*, washed several times by decantation, until on addition of fresh water it settles slowly and remains suspended for a long time, is then collected on a filter and after thorough draining washed carefully with small quantities of water at a time. The liquid passes through very slow, and assumes, after a time, a yellowish colour, which becomes deeper yellow by continued washing; the precipitate on the filter changes thereby its appearance, shrinks considerably, and obtains at last a darker brown, almost black, colour, and has the consistence of a jelly. When all the precipitate is converted into a black jelly, which in thin layers is transparent and of a deep garnet-red colour, the wash water no longer passes through the filter unless a very large quantity is above the precipitate, when it may happen that it dissolves at once, forming a black-red liquid. If the jelly is taken from the filter, a small quantity of water added to it is sufficient to dissolve it entirely after some time. The solution has, in reflected light, a pure black colour, dissolves in more water to a transparent deep red solution, is neutral, but still contains ammonium chloride, as the jelly forms before it is all washed out.

A second precipitate, obtained in the same way, was, after draining off the supernatant acid liquid, subjected to dialysis. In the same degree as the acid and ammonium chloride is removed, the precipitate in the dialyser changes at first into a jelly-like black mass, and afterwards into a turbid thick liquid of the consistence of cream. Taken then (after three weeks) from the dialyser, it dissolves on the addition of a little water, after a few days, to a perfectly clear thin liquid, of a brownish-black colour.

By using more ammonia than is necessary to precipitate the iron, precipitates are obtained, which are also soluble in water, provided that ammonia was not added in excess. The more ammonia is used the more basic the precipitates will be; these have the advantage that the ammonium chloride can be more perfectly removed by washing before the precipitates begin to dissolve, which is evidenced by the yellow colour of the filtrate, so that they may be washed until the filtrate becomes merely opalescent on addition of silver nitrate, or keeps perfectly clear. It is of the greatest importance that these more basic precipitates be as free as possible from ammonium chloride, since a small quantity prevents their solution. (It is the presence of ammonium chloride, also, that causes the gelatinization of solutions of the less basic oxychlorides.)

These more basic precipitates do not form a jelly after being thoroughly washed, but finally form a thick blackish syrupy liquid, which when taken from the filter gives, on addition of a little water, a very turbid mixture, and, on standing several days, a thin clear liquid, of a brownish-black colour, or they only change their colour by washing to a somewhat darker but not black hue, without losing much of their bulkiness. This is the case with the precipitates that were removed from a neutral supernatant liquid. After they are washed until the filtrate remains clear on addition of silver nitrate, the precipitates are taken from the filter and transferred with a little water into bottles, so that they can be shaken from time to time. The colour of the mixture is then reddish-yellow or reddish-brown, but darkens from day to day as the precipitate enters solution. In the course of several weeks a clear thin liquid, of brown colour, is obtained. A temperature of 80° to 85° F. accelerates the solution of the precipitates, while a much higher temperature prevents it.

A few experiments were made by adding to the precipitates, in perfectly neutral liquids, respectively one-half and one per cent. of the ferric solution. Under frequent stirring the mixture was allowed to stand for two days, after which the washing was commenced, and concluded finally on a filter, as above mentioned.

The writer gives below the results of the analyses

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* Read at the February Pharmaceutical Meeting of the Louisville College of Pharmacy. From *The American Journal of Pharmacy*, March, 1878.

† By calculation it was found that 92·6 c.c. of the ammonia were necessary to bind all the hydrochloric acid in 150 c.c. of this dilute ferric chloride solution.

of different preparations obtained by the above explained methods, the analyses being made as follows:—

The solutions were thoroughly mixed with an excess of pure sodium carbonate and evaporated to dryness. After dissolving the excess of sodium carbonate and the sodium chloride in water, the filtrate was acidulated with nitric acid, and the amount of chlorine determined with a tenth normal solution of nitrate of silver; the ferric oxide was calcined and weighed.

a. Solution of precipitate obtained with 81·3+1·7 c.c. ammonia—·490 Fe_2O_3 + ·061 Cl = ·441 Fe_2O_3 + ·0953 Fe_2Cl_3=82·6 per cent. Fe_2O_3+17·4 per cent. Fe_2Cl_3.

b. Solution of precipitate obtained with 81·3+three times 1·7 c.c. ammonia—·365 Fe_2O_3 + ·0248 Cl = ·346 Fe_2O_3+·0385 Fe_2Cl_3=90 per cent. Fe_2O_3+10 per cent. Fe_2Cl_3.

c. Solution of precipitate obtained with 81·3+four times 1·7 c.c. ammonia—·614 Fe_2O_3 + ·0382 Cl = ·5853 Fe_2O_3+·0583 Fe_2Cl_3=91 per cent. Fe_2O_3+9 per cent. Fe_2Cl_3.

d. Solution of precipitate obtained with 81·3+4·5 times 1·7 c.c. ammonia—·411 Fe_2O_3+·0223 Cl=·3942 Fe_2O_3+·034 Fe_2Cl_3=92 per cent. Fe_2O_3+8 per cent. Fe_2Cl_3.

e. Solution of precipitate obtained by adding 1 per cent. of ferric chloride solution to the precipitate caused by 89 c.c. ammonia—·455 Fe_2O_3+·0308 Cl=·4318 Fe_2O_3 +·047 Fe_2Cl_3=90·2 per cent. Fe_2O_3+9·8 per cent. Fe_2Cl_3.

f. A precipitate formed by adding to 150 c.c. of the ferric chloride solution 91·5 c.c. of ammonia, and washed until the filtrate remained perfectly clear on addition of silver nitrate, gave on analysis—·416 Fe_2O_3+·00602 Cl =·4115 Fe_2O_3+·00917 Fe_2Cl_3=97·83 per cent. Fe_2O_3+2·17 per cent. Fe_2Cl_3.

This precipitate was transferred to a bottle, with a little water, and shaken occasionally. At the date of this paper it has stood a little over seven weeks, during which time over three-fourths of the original precipitate has dissolved. The writer is fully convinced, to judge from its appearance, that it will ultimately dissolve entirely.

g. Another precipitate, obtained with a little more ammonia than *f* gave—·424 Fe_2O_3 and ·00318 Cl.

This precipitate has, at the date of this paper, not shewn the least sign of ever dissolving, although it has stood as long and been shaken as often as *f*.

For comparison, the writer has examined several *commercial* preparations of *dialysed iron*:—

I. ·604 Fe_2O_3+·0371 Cl=·576 Fe_2O_3+·057 Fe_2Cl_3= 91 per cent. Fe_2O_3+9 per cent. Fe_2Cl_3.

II. ·255 Fe_2O_3+·01275 Cl=·2454 Fe_2O_3+·01947 Fe_2Cl_3=92·6 per cent. Fe_2O_3+7·4 per cent. Fe_2Cl_3.

III. ·534 Fe_2O_3+·0203 Cl=·5187 Fe_2O_3+·031 Fe_2Cl_3 =94·47 per cent. Fe_2O_3+5·53 per cent. Fe_2Cl_3.

IV. ·274 Fe_2O_3+·0125 Cl=·2646 Fe_2O_3+·0191 Fe_2Cl_3 =93·3 per cent. Fe_2O_3+6·7 per cent. Fe_2Cl_3.

Dr. Hager's *Liquor ferri peroxychlorati*, which he prepares by dissolving the ferric hydrate obtained from 115 parts of ferric chloride solution in ten parts of the same ferric chloride solution, contains, when all the ferric hydrate is dissolved, 85 per cent. Fe_2O_3 and 15 per cent. Fe_2Cl_3. No doubt a more basic preparation could be realized by Dr. Hager's method, that is, by dissolving ferric hydrate in ferric chloride solution, if the ferric hydrate were perfectly pure. But, as his ferric hydrate always contains ammonia, which cannot be removed by washing, this ammonia forms, when the precipitate is added to the ferric chloride solution, ammonium chloride, which sets a limit to the solution of ferric oxide. The basicity of this preparation stands in inverse ratio to the quantity of ammonium chloride in it.

Dr. Wagner, the originator of dialysed iron, does not communicate the method for making his later preparation, the *catalytic iron*, but asserts that it is not made by dialysis, and that it takes three months to make it. To judge by this, the supposition might not be far from wrong, that it is a solution of a basic oxychloride precipitate, obtained as above explained. The writer could not obtain any of Dr. Wagner's catalytic iron, and therefore cannot say how much chlorine it contains in proportion to the ferric oxide; that it does contain chlorine Dr. Hager has fully proven.

The above experiments teach us that the preparation of a perfectly pure ferric hydrate is very difficult, almost impossible, as in one case it is apt to contain chlorine, in the other ammonia. They prove that the precipitate of oxychloride of iron is soluble in pure water, and that in its more basic combinations it is only soluble when free of saline compounds.

They likewise prove that a solution of very basic oxychloride can be prepared without dialysis, and that the product may be made to contain a less per cent. of chlorine than that found in the best commercial sample of dialysed iron examined by the writer.

By referring to the precipitate of experiment *g*, it becomes evident that the solvent power of ferric chloride on ferric hydrate has a limit. This indicates at the same time that a pure ferric hydrate will not dissolve, and that in all the different iron solutions, whether they be called peroxychloride, dialytic or catalytic, the ferric oxide is kept in solution by ferric chloride. As the proportion of these two ferric compounds can be changed at will, a chemical combination of them cannot be well thought of.

TEST FOR ELATERIN.*

BY DAVID LINDO.

The active principle in elaterium affords a very beautiful reaction with carbolic acid, and concentrated sulphuric acid. The test may be applied as follows:—

Place a few crystals of elaterin in a small porcelain capsule, and add one or two drops of liquefied crystals of carbolic acid (Calvert's No. 1 liquefied by moisture).

The elaterin dissolves in the carbolic without production of colour; but if two or three drops of concentrated sulphuric acid are allowed to flow into the mixture, an intense and beautiful carmine colour is developed, changing at first to orange, and after some time to scarlet. Alkalies discharge the colour. I have not been able to obtain a reaction resembling this with any of the alkaloids and carbolic acid, nor with any other substance tried.†

If liquefied crystals of carbolic acid are not at hand the solid crystals can be used. After adding them to the elaterin, add a drop of chloroform or alcohol before applying the sulphuric acid. The addition of sulphuric acid alone to elaterin gives rise to no characteristic colour. The elaterin cakes together, dissolves slowly, and imparts a yellow colour to the acid. If the carbolic acid is now added the reaction is obtained very imperfectly. The reagents should therefore be added in the order stated above.

The test can be applied direct to some samples of the elaterium of commerce (dried sediment of the juice) if they are reduced to fine powder.

Other samples may require the powder to be agitated with chloroform and the solution filtered. A few drops of the filtrate evaporated to dryness by blowing on the surface will afford a residue for testing.

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* From the *Chemical News*, January 25, 1878.

† If a nitrate in the dry state is treated in the same way with carbolic and sulphuric acids, a deep green colour is developed, which changes to red on the addition of a little water.

The Pharmaceutical Journal.

SATURDAY, APRIL 6, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, *17, Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary, 17, Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE DENTAL PRACTITIONERS BILL.

THE close similarity between the section of the Duke of RICHMOND'S Medical Bill which relates to the examination, licensing and registration of dentists, and the Bill brought in by Sir JOHN LUBBOCK admits of the conjecture that the latter may eventually be abandoned if the Medical Acts Amendment Bill be proceeded with; but it is nevertheless deserving of mention that up to the present time it does not appear that any notice of amendment has been given with the object of carrying out the intention expressed by Sir JOHN LUBBOCK in his letter to the President of the Pharmaceutical Society.

The point urged by the President in his communication to Sir JOHN LUBBOCK was that the terms of the fifth section of his Bill might possibly be interpreted in such a manner as to preclude chemists and druggists who have been engaged in the practice of dentistry from continuing this branch of their business, inasmuch as it might be held that they had not been engaged in the practice of dentistry "either separately or in conjunction with the practice of medicine or surgery." Such an interpretation would certainly be a great injustice to those who have been in the habit of carrying on the practice of dentistry and in many cases it would be attended with considerable inconvenience to the public.

Sir JOHN LUBBOCK appears to have fully appreciated this view of the matter, and in his letter to the President of the Pharmaceutical Society he admits that the point urged against the section referred to seemed to him to have so much force in it that he should be happy to omit the words in question. It appears, therefore, somewhat remarkable that among the amendments to the Bill, of which notice has been given, there is no amendment which proposes to deal with the objections raised by chemists and druggists engaged in practising dentistry. It is true that the time fixed for the Bill to be taken in Committee is still sufficiently distant to afford ample opportunity for notice of the amendment desired by chemists and druggists being given, either by Sir JOHN LUBBOCK himself, or by Mr. RICHARDSON GARDNER, the member for Windsor, who has also expressed his intention of proposing an amendment calculated to meet the views of those chemists and druggists who are apprehensive that the fifth section of the Bill, as it stands, might operate to their prejudice.

On a previous occasion we mentioned that Mr. WESTLAKE, of Windsor, suggested the presentation of petitions by the chemists and druggists practising dentistry in every borough, town, or county throughout the kingdom, and he has undertaken the preparation of such a petition, which was signed by one hundred and twenty-nine chemists and druggists and presented by Mr. RICHARDSON GARDNER.

But whatever may be the ultimate fate of Sir JOHN LUBBOCK'S Bill, and whatever amendments may be proposed in regard to it, the danger apprehended in regard to the practice of dentistry by chemists and druggists still threatens them from another quarter, for, as we mentioned last week, the objectionable words of the Dental Practitioners' Bill are almost exactly reproduced in the twenty-third section of the Medical Acts Amendment Bill introduced into the House of Lords by the Duke of RICHMOND and GORDON. It will therefore be necessary to renew in the House of Lords the representations that have already been made in the interests of chemists and druggists engaged in the practice of dentistry, and to lay them before the Duke of RICHMOND in the same manner that they have already been urged upon the consideration of Sir JOHN LUBBOCK and other members of the House of Commons.

It will be noticed in the report of the Council proceedings that this course was recommended by the Law and Parliamentary Committee in the report submitted to the Council. The second reading of the Duke of RICHMOND'S bill is fixed for the 15th of April, and as the report of the Law and Parliamentary Committee of the Council was adopted the requisite steps will doubtless be taken in the interim to provide for the protection of chemists and druggists in respect to the practice of dentistry.

PHARMACY IN URUGUAY.

THE Republic of the Banda Orienta del Uruguay does not appear to present many attractions for pharmacists; but as it may be that the ubiquitous longings natural to the inhabitants of these islands occasionally turn the thoughts of some of the readers of the Journal in that direction, it will not only be interesting but useful to put on record some information received from a correspondent as to the position of pharmacy in that country.

In the first place, as the examinations of the Pharmaceutical Society of Great Britain are not recognized in Uruguay, a registered British pharmacist who wished to carry on business in Monte Video would have to pass an examination carried out under the authority of the Republic. The examination is conducted in the Spanish language, and the examinee if successful, is privileged to bear the title of "Apothecary of the Republica Banda Oriental," and also to pay for it the enormous fee of one hundred and eighty dollars, equal to £37 10s. In paying this large sum, moreover, he has not the consolation of hoping that any portion of it goes towards the promotion of pharmacy. Still as these fees are payable to the State, and the rulers who for a longer or shorter—but generally shorter—time direct the destinies of the republic, are generally quite able to appreciate the adage, to "make hay while the sun shines," they probably help to develop in high quarters an appreciation of the profits to be derived from the cultivation of science.

The examination being passed and the fee paid, the pharmacist must be prepared for hard work, for long hours appear to be prevalent in Monte Video. The pharmacies, our correspondent says, are as a rule opened at half-past six in the morning, and closed at eleven at night, while there, as here, there are nevertheless some which are earlier and later than others.

There is one respect, however, in which the Uruguayan pharmacist enjoys an advantage. He lives in the midst of a region specially rich in medicinal plants, many of which are already in use among the people, although unknown in the science of therapeutics, and their systematic examination would probably richly reward the chemical investigator.

PROFESSOR SCHWANN.

We learn from *Nature* that in the course of a few weeks a festival will be held in the city of Liége the object of which will have an especial interest for botanists and students of vegetable physiology. Theodore Schwann, the founder of modern histology and the originator of the cell theory, occupies the position of Professor of Physiology in the University of Liége and it is to celebrate the fortieth year of his professorship that it is proposed to hold the festival and to invite scientific societies and individuals to join in the expression of sympathy with the object of doing homage to the genius of Schwann. It appears that a committee has been formed in order to make the requisite arrangements, and to communicate with foreign societies, Professor Edouard van Beneden of Liége acting as the Secretary, and letters to be read at the celebration are to be forwarded to him or to Mr. Ray Lankester, Exeter College, Oxford. It is requested that those who have been occupied in the same field of research as that opened up by Professor Schwann should communicate with one or other of the above-named gentlemen and forward their photographs for insertion in an album which is to be presented to him on the occasion.

AMERICAN EDITION OF 'PHARMACOGRAPHIA.'

We learn from *New Remedies* that arrangements are being made by Professor Fluckiger with Messrs. Wood and Co., of New York, for the publication of an edition of the 'Pharmacographia' specially adapted to the materia medica of the United States, Canada, and the West Indies.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, April 3, 1878.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Gostling, Greenish, Hampson, Hanbury, Hills, Owen, Rimmington, Sandford, Schacht, and Shaw.

The minutes of the preceding meeting were read and confirmed.

Nominations for Council and Auditors.

The Secretary reported that there had been *thirty* nominations to fill the fourteen vacant seats on the Council, and the following *twenty-one* nominees had signified their willingness to accept office if elected :—

Andrews, Frederick, 34, Leinster Terrace, Hyde Park, W
Atkins, Samuel Ralph, Market Place, Salisbury.
Betty, Samuel Chapman, 6, Park St., Camden Town, N.W.
Butt, Edward Northway, 13, Curzon Street, Mayfair, W.
Fairlie, James Mitchell, Charing Cross Corner, Glasgow.
Frazer, Daniel, 113, Buchanan Street, Glasgow.
Gostling, Thomas Preston, Market Hill, Diss.
Greenish, Thomas, 20, New Street, Dorset Square, N.W.
Hampson, Robert, 205, St. John Street Road, E.C.
Hills, Thomas Hyde, 338, Oxford Street, W.
Mackay, John, 119, George Street, Edinburgh.
Owen, John, 51, Holloway Road, N.
Richardson, J. G. F., Houghton House, Stoneygate, Leicester.
Sandford, George Webb, 47, Piccadilly, W.
Savage, William Dawson, 4, Park Road East, Brighton.
Schacht, George Frederick, 7, Regent St., Clifton, Bristol.
Slipper, James, 86, Leather Lane, E.C.
Symes, Charles, 14, Hardman Street, Liverpool.
Williams, John, 16, Cross Street, Hatton Garden, E.C.
Wills, George Sampson Valentine, 62, Lambeth Rd., S.E.
Woolley, George Stephen, 69, Market St., Manchester.

The following *nine* nominees declined to accept office, if elected :—

Atherton, John Henry, Nottingham.
Brown, William Scott, 113, Market Street, Manchester.
Hills, Walter, 338, Oxford Street, W.
Hodgkinson, William, 127, Aldersgate Street, E.C.
Jones, Samuel Urwick, Chirton House, Leamington.
Mackenzie, James, 45, Forrest Road, Edinburgh.
Morson, Thomas, 124, Southampton Row, W.C.
Vizer, Edwin Bennett, Church Rd., Cliftonville, Brighton.
Whitfield, John, 113, Westborough, Scarborough.

Nine nominations for Auditors had been received, and the following *five* had signified their willingness to accept office if elected:—

Harvey, Edward, 6, Giltspur Street, E.C.
Hodgkinson, William, 127, Aldersgate Street, E.C.
Squire, William, 5, Coleman Street, E.C.
Stacey, Samuel Lloyd, 300, High Holborn, W.C.
Thompson, H. Ayscough, 22, Worship St., Finsbury, E.C.

The following had declined to accept office:—

Barron, Frederick, 2, Bush Lane, Cannon Street, E.C.
Horner, Edward, 20, Bucklersbury, E.C.
Watts, Wm. Manning, 32, Lower Whitecross St., E.C.

It was proposed by the President, seconded by the Vice-President, and resolved unanimously—

"That Mr. Frederick Barron having expressed a wish to withdraw his name on the present occasion from the list of proposed auditors, the Council cannot allow the circumstance to pass without recording its thanks to him for the valuable services he has rendered to the Society for so many years."

Elections.

Members.

Pharmaceutical Chemists.

Bouttell, Harold ....Edinburgh.
Maggs, Frederick Richard ......Yeovil.

Chemists and Druggists.

Drinkwater, Peter Bramwell ...Manchester.
Laird, George Hardie ....Edinburgh.
Polglase, Francis J. W. ....Newcastle-on-Tyne.

Associates in Business.

The following having passed their respective examinations, being in business on their own account and having tendered their subscriptions for the current year were elected "Associates in Business" of the Society:—

Minor.

Cooley, Walter Bromley.........Wolverhampton.
Hill, William ....King's Lynn.
Moon, Murray James ....London.
Moore, Joshua ....Preston.
Moses, Joseph ....Bishop Auckland.
New, Thomas Cheney ....Stratford-on-Avon.
Plumer, William Cork............London.
Richards, John Wesley ....Alnwick.
Shenstone, James Chapman ...Colchester.
Shepley, Frederick Thomas ...London.
Thomas, John Rush...............London.
Thornton, Edward ....Leamington.
Woodhouse, George...............Ludlow.

Modified.

Baker, John Thomas ....St. Helier's.
Bambridge, James Williams ...East Dereham.
Breton, Harvey Wolstenholme Leicester.
Lloyd, Thomas Edwin............Garston.
Lynn, Sam..........................London.
Wallace, William..................Glasgow.

Associates.

The following having passed their respective examinations and tendered their subscriptions for the current year were elected "Associates" of the Society:—

Minor.

Brown, Francis Arthur ....Liverpool.
Dingle, James Hender ....Penzance.
Hendy, Albert......................Bristol.
Hobson, Charles, jun. ....Windsor.
March, Richard ....Stamford.
Murdoch, James Wm. Aitken Dumfries.
Watt, George William ....Huntly.
Williams, William ....St. Clears.
Wood, Frederic Percy ....Bolton.

Modified.

Wrighton, Alfred..................Birmingham.

Apprentices or Students.

The following having passed the Preliminary Examination were elected "Apprentices or Students" of the Society:—

Bartlett, Geo. Fredk. Handel...New Wandsworth.
Charlesworth, Moorhouse ......Saltaire.
Cook, Wm. Richard...............Bath.
Dutton, Hugh Odard ....Rock Ferry.
Freeman, John Henry............Ipswich.
Gulliver, William Inchle ......London.
Harries, David ....St. Clears.
Hubbard, A. E. L. F. W. A....Downham Market.
McNay, David ....Thornhill.
Norfolk, John William ....Beverley.
Phillips, Albert William.........Notting Hill.
Remfry, Samuel Alfred ....London.
Shannon, Robert James ....Birmingham.
Wright, Robert.......................Buxton.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

The name of the following person was restored to the Register of Chemists and Druggists:—

James John Young, 8, Major's Corner, St. Hellen's, Ipswich.

Honorary Members.

The Council proceeded to select the names of persons for election as Honorary Members at the next meeting, and the names selected were ordered to be exhibited until that time in the library, in accordance with the Bye-law.

The President observed that there were at present forty-three honorary members, leaving seven vacancies to make up the number of fifty. He suggested that it was not desirable to fill up all the vacancies.

Reports of Committees.

Finance.

The report of this Committee was received and adopted and sundry accounts ordered to be paid.

Benevolent Fund.

The report of this Committee included a recommendation of the following grants:—

£10 to a registered chemist and druggist, formerly in business, now out of employment and suffering from paralysis.

£10 to a registered chemist and druggist, formerly in business, now out of employment.

£10 to an applicant, aged 62, who has received four previous grants of like amount.

£15 to a pharmaceutical chemist and former member, now suffering from paralysis, and entirely dependent on his friends.

£5 to a female registered chemist and druggist, now out of business and in distressed circumstances. The case to be further considered.

The Secretary reported the death of Mrs. Goldfinch, one of the annuitants, and of Mrs. Knight, who was an unsuccessful candidate at the last election.

The report was received and adopted.

The President thought the question would have to be considered by the Committee, whether a small grant should be made to assist in meeting the expenses incurred in respect of the last illness and funeral of annuitants. The time was often one of great pressure, and he thought the suggestion he had thrown out would be worth consideration.

Mr. Hampson said the difficulty would be to place the money in the right hands.

The President said that could be left to the judgment of the Committee. When the person applying was a near relative of an annuitant the Council might make a small grant.

Mr. Greenish said there were many applications of this sort, and the subject was well worth consideration.

It was unanimously agreed that the Committee should take the matter into consideration.

Sub-Committee to consider proposed Amendments to the Pharmacy Act, 1868.

Mr. Betty, in accordance with the notice he gave at the last meeting, moved—

"That the report of the Sub-Committee appointed to consider and report on any amendments which may be expedient in the Pharmacy Act be received, adopted, and acted on at a suitable opportunity with such additions or modifications as may at that time be resolved upon."

Mr. Hills moved that the discussion should take place in committee.

Mr. Betty said his remarks would be so general that he thought it would be rather beneficial to the Pharmaceutical Society that they should be published.

Mr. Sandford said the resolution was clearly that the amendments proposed should be adopted and acted upon, and therefore would require such detailed discussion as could only properly take place in committee.

Mr. HAMPSON said the question Mr. Betty was about to introduce arose out of a report from the Sub-Committee appointed by the Council to consider any proposed amendment of the Pharmacy Act. The advisability of appointing this Committee and entertaining the question of any amendments at all was considered openly by the Council and freely discussed, and he could not see why when the report of the Committee was brought forward in the form now adopted the discussion should be held with closed doors. It looked as if the Council was afraid to discuss the Pharmacy Act at all. He maintained that there was nothing at all to conceal, and any action that might be taken in connection with the amendment of the Act of 1868 was a fit subject to discuss openly. Nothing was wanted from the Legislature but what was for the public benefit as well as for that of the trade.

Mr. BETTY assured the Council he would not say one word which might not with advantage be published, and he was sure that the same judgment which would guide him would operate with other gentlemen round the table. Therefore he thought the Council might safely discuss the question openly.

Mr. ATKINS asked if anything on this matter had already been published, or was it then starting *de novo.*

The PRESIDENT said none of the proposed amendments had been published.

Mr. BETTY said the matter was referred to in the proceedings of last month.

Mr. CHURCHILL saw no reason for going into committee.

Mr. HILLS said his only ground for proposing to go into committee was that he did not think the time was ripe for taking any action.

Mr. SANDFORD said the manner in which this question arose was as follows:—There were certain measures expected to come before Parliament in which Mr. Hampson thought the Council might get certain clauses inserted for the benefit of pharmacy, and he proposed that a committee should be appointed to consider the question when an opportunity arose. That led to a long discussion, and Mr. Atkins proposed as an amendment that a committee should be formed to consider what alterations were necessary in the Pharmacy Act, without confining it to any opportunity which might arise. The Committee was appointed and that was all that was published at the time. Then the Committee came to certain resolutions which Mr. Betty now proposed to consider, and therefore he said that if the discussion were published it would go forth entirely as a new publication. He thought there were some things which it might be wise to try for and some which it would not, and therefore he thought it would be unwise to discuss them publicly.

Mr. HAMPSON said Mr. Sandford was entirely mistaken in saying that the view he took in introducing the question was that there was some probability of a Bill being introduced. His efforts were not entirely directed to making use of that opportunity.

A vote was then taken on the motion that the Council resolve itself into committee to consider Mr. Betty's motion, with the following result;—

For—Messrs. Bottle, Cracknell, Gostling, Greenish, Hills, Rimmington, Sandford, Savage.

Against—Atkins, Betty, Churchill, Hampson, Owen, Schacht, and Shaw.

The motion was therefore carried, and the discussion was taken in committee.

On resuming, the following resolution was carried unanimously.

"That the report of the Sub-Committee of the Parliamentary Committee appointed to consider and report upon any amendment that may be considered expedient in the Pharmacy Act, be received, approved, and recorded, as a basis to be acted upon at a suitable opportunity, with such additions and modifications as may at that time be resolved upon."

LIBRARY, MUSEUM AND LABORATORY.

This report included the report from the Librarian, stating that the average attendance in the library during the preceding month had been, day, 27; evening, 12. Circulation of books, town, 155; country (21 places), 37; carriage paid 12*s.* 10½*d.* The following donations had been made to the library:—

'Pharmacopœa generalis.' By J. R. Spielmann. Venice, 1785-6. From an Associate, per Mr. R. Reynolds.

'Cataract and other Eye Affections.' From Jabez Hogg, Esq. (Author).

Cooley's 'Cyclopædia of Practical Receipts.' 6th Ed. Part 1. From the Publishers.

'Des Quinquinas,' and ten other pamphlets. From Professor Planchon (Author).

'Remarks on the Ipecacuan Plant.' From Professor Balfour (Author).

'Chemische Beiträge zur Pomologie,' and three other pamphlets. From Professor Dragendorff.

The Committee recommended that the sum offered to Professor Redwood for editing the 'Historical Sketch of the Progress of Pharmacy' be increased in order that he might employ assistance and get the work completed in the shortest practicable time. Also that a general index to the Journal for the last ten years be prepared by the Sub-Editor. The Committee had had an interview with the Editor of the Journal with regard to the resolution passed at the last Council meeting that authors of papers read at the North British Branch should be supplied with reprints of such papers when published in the Journal, and it was recommended that the number of such reprints should be limited to twenty-five.

The Curator had reported the average attendance in the museum to have been, day, 16; evening, 4. That he had received a letter from Dr. Keik enclosing a list of 1237 herbarium specimens, besides eight special collections for disposal, and that he had selected about 200 specimens which he thought it would be desirable to obtain for the museum.

The Committee recommended that these be purchased.

The Curator had also reported the donation to the museum of the specimens reported in the proceedings of the last evening meeting; also that Professor Planchon, of the School of Pharmacy in Paris, had made arrangements with him to exchange duplicate specimens of drugs; that Professor Bommer, of Brussels, had forwarded a list of duplicate specimens of drugs and desiderata; that he had received a list of desiderata from Herr Oberdorffer, of Hamburgh, and that he had prepared a list of duplicate specimens in the museum for disposal.

The Committee recommended that the list be forwarded to Edinburgh for selection of specimens, and that a list of the remainder be published in the Journal.

The Curator had also laid before the Committee numerous letters from eminent men acknowledging the receipt and approving of the Catalogue.

The Professors had reported favourably of their respective classes.

An application from the Honorary Secretary of the Chemists' Assistants' Association for the use of a room in the Society's house for a lecture had been considered, but the Committee did not recommend compliance with the request.

The Committee had also prepared the draft annual report.

The report and recommendations of the Committee were received and adopted.

Reprints of Papers.

Mr. BOTTLE said last month Mr. Mackay reported that the Editor had refused copies of papers read by gentlemen at evening meetings of the North British Branch, such copies having formerly been given. He then moved that such gentlemen should be entitled to the privilege they had hitherto enjoyed, but it appeared from inquiries made of the Editor that it was not twenty-five copies which he refused to supply, but requests for a much larger number. Such requests seemed to him to be unreasonable, and with a view to limit it, he would move—

"That twenty-five copies of each paper read at evening meetings of the Society in London or Edinburgh and published in the Journal be sent to the authors of them, and that no further copies be supplied."

Mr. GREENISH asked if this would prevent the author of a paper from obtaining twenty-five more copies if he were prepared to pay for them.

Mr. BOTTLE thought it well to preclude gentlemen from getting more copies from the Journal printing office, which should not be made a convenience for trade purposes. On some occasions papers were read with a view to being subsequently advertised. Twenty-five copies was as many as a man could want for distribution amongst his friends, and those who required them for trade purposes should publish them themselves.

Mr. HANBURY suggested the addition of the word "gratuitously" at the end of the motion.

The PRESIDENT said that involved the principle whether further copies could be had on payment.

Mr. GREENISH said there were very few papers which could be considered as being read for trade purposes.

Mr. BETTY said the Committee had gone carefully into the matter, and the rule was proposed to prevent abuses.

Mr. SHAW thought this resolution would limit the privilege to papers read at London and Edinburgh; but he thought papers which were read at other provincial societies if inserted in the Journal should be entitled to the same privilege.

The PRESIDENT said he believed this privilege had never been extended to provincial societies.

Mr. SHAW said he had himself some years ago received copies of a paper he had read at Liverpool.

The PRESIDENT explained the different considerations which applied to papers read in London and at provincial societies.

Mr. SCHACHT said he had hitherto received on application copies of any papers he had read, and as he understood the present resolution it would preclude him ever asking for them and offering payment. As to the objection to advertising, the mere insertion of a paper in the Journal was a grand advertisement and a few more copies more or less afterwards could be of no material consequence.

Mr. HAMPSON supported the motion as it stood. He did not wish to undervalue any papers read at provincial associations, but he must admit that the papers read in London and Edinburgh in connection with the Society stood on somewhat different footing. When the large number of copies of which the circulation of the Journal consisted had been distributed he thought all had been done that could be expected. It would be better to have a definite rule to follow.

Mr. SANDFORD did not think the motion would in any way prevent the supply of papers such as had been referred to by Mr. Shaw and Mr. Schacht. The question of provincial societies was raised last month, when Mr. Mackay disclaimed any intention of touching it at all, and confined his attention to the papers read at the North British Branch. It seemed to him the motion only followed that.

Mr. SHAW said the motion mentioned two places only, and by inference all others would be excluded.

The PRESIDENT said copies were hitherto only sent to those who applied for them. No doubt that would be continued.

Mr. SHAW said it would be satisfactory if that expression of opinion were recorded.

After some further conversation, it was decided to refer the matter back to the Library Museum and Laboratory Committee for further consideration and report.

The Annual Report.

The Council then went into Committee to discuss the draft report, which with certain verbal alterations was agreed to in order to be presented to the Council at its next meeting.

HOUSE.

The report of this Committee referring to certain matters of detail affecting the repairs and furniture of the house, and recommended certain painting, cleaning, etc., to be done in the autumn recess, was received and adopted.

The PRESIDENT remarked that next year the International Pharmaceutical Congress would meet in London, and therefore it would be desirable that the house and premises should be put in good condition so as to exhibit a good appearance. It would be a question for the Committee to determine whether specifications and estimates should be obtained or not.

LAW AND PARLIAMENTARY.

The report of this Committee referred to some alleged cases of breaches of the Pharmacy Act, and to the usual report from the Solicitor. It also suggested that a letter should be sent to the Duke of Richmond with reference to the Medical Act Amendment Bill, in similar terms to that sent to Sir John Lubbock with regard to the Dental Practitioners' Bill.

The report was received and adopted.

GENERAL PURPOSES.

At a meeting of this Committee reports from the Professors had been laid before it as to the Prize Examinations.

Professor Redwood had reported very favourably of the regularity and attention of his class. The weekly *vivâ voce* examinations had been attended by all the pupils, and to this he attributed the more than usually satisfactory results of the examination. The number of competitors was fifteen, and fourteen completed papers were produced. Six papers had an aggregate of values attached to the answers of more than 75 per cent., the highest being 90 per cent. of the full value.

The Committee having opened the six motto envelopes containing the names of the successful competitors recommended the following awards:—

Chemistry and Pharmacy.

Bronze Medal ....William Brandwood Mason.
Certificate of Merit ...John Graham Sangster.
" " Henry Allen.
" " John Goodwin Cox.
" " Fredk. Wm. Collinson.
" " John Sydney Ashweek.

Professor Bentley had reported that eighteen candidates had competed for the bronze medal and certificates, and the results were most satisfactory, especially in the case of the first four. From some experiences in other educational institutions he had no hesitation in saying that such a high average of marks was but rarely obtained. The number of pupils had been about the same as at the same period of last year, and the proverbial good character of the school had been thoroughly maintained. He had still further developed the system of examination by testing the progress of the pupils after each lecture, and examining them in rotation on the subjects treated in the preceding lecture, so that practically each lecture now occupied from one and a half to two hours.

The Committee having opened the motto envelopes containing the names of the candidates who obtained the highest number of marks recommended that the following awards be made:—

Botany and Materia Medica.

Bronze Medal ....Henry Allen.
Certificate of Merit ...John Goodwin Cox.
" " Wm. Brandwood Mason.
" " John Sydney Ashweek.
" " John Graham Sangster.
" " Fredk. Walmsley Warrick.

The report and recommendations were received and adopted.

THE CONVERSAZIONE.

A meeting of the Conversazione Committee had been held and arrangements made similar to those on the last occasison. The report was adopted.

PHARMACEUTICAL MEETING.

Wednesday, April 3, 1878.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

A number of specimens, of which the following is a list, were exhibited :—

Indifferent Resin of Gurjun Balsam ($C_{28}H_{46}O_2$) crystallized (see before, p. 725), from Professor Fluckiger; Herbarium specimens of *Urechites suberecta*, Muell. Arg., from Jamaica, Urechitin, amorphous and crystalline Urechitoxin, Distilled Essential Oil of Orange Rind, of Orange Leaves, and of Red Cedar, and Expressed Oils of the seeds of *Hura crepitans*, and of *Calophyllum Calaba* from Mr. J. J. Bowrey, the Government Chemist in Jamaica; Specimens of the Double Chloride of Iodine and Potassium (KCl,ICl_3), from Mr. W. R. Dunstan; Specimen of Mercuric Chloride in crystals, from Mr. J. F. Savory; Specimen of Ozokerine, and of Angica Gum, from Brazil, from Messrs. Hearon, Squire, and Francis; Specimen of Resin called "Copal," from the Fiji Islands, from Mons. C. Chantre.

The minutes of the previous meeting having been read and confirmed—

The CURATOR called attention to the specimens from Jamaica. The oils of cedar and of orange peel appeared to him to be of excellent quality; the latter although it was distilled two years ago was still as sweet and as fragrant as if it had been made recently by the cold process; it was very rare in commerce to find oil of orange peel keep fragrant so long. The oil of the sandbox tree (*Hura crepitans*), was a drastic purgative in doses of 4 or 5 drops; perhaps it might be turned to account in the form of pills. The glucosides urechitin and urechitoxin were probably the most powerful poisons known, since he had been informed by Mr. Bowrey that $\frac{1}{500}$th of a grain sufficed to kill a pigeon. A specimen of the plant from which it was procured (*Urechites suberecta*, Muell. Arg.), was also upon the table. He believed that a paper on its physiological action had been forwarded to the Royal Society, and another on its chemistry to the Chemical Society, by Mr. Bowrey, and it would therefore be premature to say anything more about the poison at present. The specimens had been presented on this occasion as the donor was shortly about to return to Jamaica. The pretty specimen of corrosive sublimate in crystals and the double chloride of iodine and potassium were prepared by gentlemen who were studying in the laboratory of the Society, and were very creditable specimens. The ozokerine was, he believed, intended to compete with vaseline and was offered at a cheaper price, but whether equal to the latter he was unable to say. It appeared to be free from odour and of a convenient consistence. The copal from the Fiji Islands appeared to him to be very similar to Kauri gum, but he had not as yet examined it carefully. He thought it was very important that the products of foreign countries should be sent home for trial, and this appeared to be now done to a much greater extent than formerly.

Mr. BOWREY said the oil exhibited was prepared from ripe Seville oranges, just as they were turning yellow. They were brought down to his laboratory from the hills, peeled as quickly as possible, cut up in a sausage machine, and then distilled by means of superheated steam, at 120° to 130°C. These specimens had now been made for two years and three months, and had been a year in England. The oil of cedar was from a large log, which was cut up with a hatchet, and twenty pounds yielded one pound of the oil.

The PRESIDENT asked if Mr. Bowrey had formed any theory why these oils kept so much better than those generally used.

Mr. BOWREY said the subject was quite new to him and he knew very little about it.

The PRESIDENT said that oil of orange peel, especially, soon underwent a change, and then had a turpentiny odour.

Mr. BOWREY said he had carefully dried these specimens with plaster of paris, and besides possibly the freshness of the fruit had something to do with it. One sample of peel which was kept for about a day gave an oil which soon underwent a change. When he returned he intended to experiment with the green fruit which he expected would yield a larger quantity of oil, and probably a more fragrant product.

Mr. HILLS having taken the chair, a paper was read on—

SALICYLIC ACID.

BY JOHN WILLIAMS, F.C.S.

The paper is printed at p. 785, and gave rise to the following discussion :—

The CHAIRMAN in proposing a vote of thanks to Mr. Williams said the Society would no doubt have a further paper from him on the same subject, as he was continuing the investigation.

Professor REDWOOD said the paper was an interesting contribution and one of no small importance. Mr. Williams had done a great deal towards affording the explanation of a fact which many had been aware of, namely that the artificial salicylic acid sometimes failed in producing the effects anticipated, such as would be produced by the natural acid. He had had very little practical experience of its use, but he knew that difficulties had attended the use of the artificial acid.

Mr. PLOWMAN could fully confirm what Mr. Williams had said with reference to the statement that artificial salicylic acid frequently caused considerable derangement to the system. It had been given in St. Thomas's Hospital in doses of 20 grains every two or three hours and the result had frequently been to cause delirium, so much so that in one case the patient got under his bed and moved about with it upon his back, and in another case the patient pulled the leg off the bedstead and threatened the attendant. The subject had been brought under his notice but he had not yet had time to investigate it. He was therefore interested to learn from Mr. Williams that there was probably a new acid existing in combination in the commercial artificial acid. The salicylic acid used in St. Thomas's Hospital was colourless and distinctly crystalline. He had not examined the nature of the crystals but they were somewhat minute, perhaps one-third or one-fourth the size of a pin's head. He did not know the history of the acid used, but he thought from the price paid it was probably artificial. Although it sometimes appeared to derange the system, at the same time it had the required effect of lowering the general temperature.

Mr. NAYLOR having given some attention to this subject would ask Mr. Williams whether he could explain to what the colour was due in the alkaline compounds of salicylic acid; was it to a chemical or a physical change? He had some reason to believe it was a chemical change. The way in which he had operated on a small scale, was to mix the salicylic acid with the alkali in contact with carbonic acid gas, and continue the current during the process of evaporation. By that means, after recrystallization, he got a fairly colourless body, but this process was too expensive to work commercially. He next tried to get the same effect by evaporating the solution *in vacuo*. But the dry salicylate of sodium had then a distinct rose tinge, and when exposed to the air at 120°F. the air being somewhat moist it deepened in colour. Then he tried if he could obtain this deep colour by exposure during evaporation to a limited quantity of air, and the same colour was produced. The coloured portion appeared to him to resemble rosolic acid, although the quantity was too small to enable him to be certain, but it answered to many of the tests. He could neither explain the reaction nor how the rosolic acid could originate except on the ground that the salicylic acid which he employed contained some carbolic acid. He carefully tested it, therefore, and found that the salicylic acid was commercially pure; at any rate, free from carbolic acid.

Mr. PLOWMAN asked how Mr. Naylor determined that the salicylic acid was free from carbolic acid.

Mr. NAYLOR said he was quite aware that it was very difficult to assure one's self that salicylic acid was free from carbolic acid, but he thought the process given in the Journal some time ago might be fairly relied upon, not the one by recrystallization, but by the action of hypochloric acid, or chlorinated lime, on a feeble alkaline solution. At any rate if it contained any carbolic acid it could not contain sufficient to give rise to rosolic acid.

Mr. CLEAVER said it was extremely difficult to evaporate a solution of artificial salicylic acid without decomposition taking place the carbolic acid being formed.

Mr. WILLIAMS in reply said the evaporation of the salicylic acid in water was not desirable or proper, for it was very volatile in the vapour of water and a great deal might be thus lost. He was in the habit of neutralizing it and making it into a soda salt before attempting to evaporate the mother liquor. Respecting the colour produced by salicylic acid in the presence of an alkali, it was a well known fact and there was some difficulty in preventing it. It would be found that if the process were begun, not in an aqueous solution but in an alcoholic, the colour would be avoided to a great extent. In fact he had found that it was better to use alcohol for the purpose of making white salts. The salicylic acid was chemically closely allied to gallic acid and pyrogallic acid, and others of a class which when united with an alkali absorbed oxygen and became brown.

Mr. HILLS then resigned the chair to the President, who called on the Curator to read a—

NOTE ON GRINDELIA ROBUSTA.

The paper is printed on p 787, and gave rise to the following discussion :—

Mr. MARTINDALE said he had received a letter some twelve months ago from Dr. Squibb, together with a present of some *Grindelia*. In the letter Dr. Squibb said the *Grindelia hirsutula* had been used as a remedy for rhus poisoning, but not for asthma, but the *G. robusta* was used for the treatment of that symptom, and he knew of one house which had sold over 1000 lbs., and during the last two years all sold more or less of it. He had, however, only heard of one physician who had used it, and did not know with what results. He inferred, therefore, that it was chiefly used in self-medication. With proper skill in diagnosis of the causes of asthma the plant would be well worth a trial on such as should be relieved by nitrite of amyl but were not. He had much pleasure in forwarding a sample, which he believed to be the plant as described by Torrey and Gray, their best botanical authorities, but whether gathered at the period of greatest activity he could not say. He (Mr. Martindale) had examined the drug a little, but not with any definite results, and whether it was the resin present on the flower-heads which formed the active principle he could not say. He had made an alcoholic extract, and, exhausting this with water, had tried it with different reagents to see if he could get any alkaloidal reaction. With a solution of iodohydrargyrate of potassium he got no result; with an aqueous solution of iodine there was a dark brownish precipitate, and perchloride of platinum gave a minute quantity of crystalline precipitate. With solution of ammonia this aqueous solution, obtained by treating the alcoholic extract, gave but little reaction, so that whether it was a neutral or an alkaline principle to which the action was due he could not say. A full abstract of a paper on this drug, by Mr. Steele, appeared in the sixth volume of the present series of the Journal. It was very difficult to treat the drug pharmaceutically, for it was very tough and difficult to reduce to a state of comminution, and it could hardly be percolated or macerated with success, the stems and other parts of the plants causing great waste. It had been used to some extent in America, but very little in England as yet.

Professor BENTLEY said that so far as he could judge from reading the American publications, this plant was worthy of more trial than it had yet received in this country. It was by no means a new remedy, for it was more than ten years since attention was first called to it in California as a remedy in asthma, and it had been used to some extent in the United States since. He was glad, therefore, that Mr. Holmes had called attention to the different species of Grindelia. Another question was that started by Mr. Martindale as to the active principle. At present it seemed natural to conclude that the activity was due to the resinous matter which covered the flowers heads. There was a very good paper on the preparations of Grindelia in the 'Proceedings of the American Pharmaceutical Association' about four years ago,* and he might add that this volume was a most valuable annual publication, from which he had received great assistance with regard to medicinal plants. Particular reference was made in that paper to the great benefit derived from the use of a decoction of the *Grindelia* in relieving the cutaneous eruptions caused by the emanations of the poison oak. The effects described were very marked, and probably the drug might be useful in other cutaneous affections.

The last paper read was a—

NOTE ON THE ALKALOID OF DUBOISIA MYOPOROIDES.
BY A. W. GERRARD, F.C.S.

The paper is printed on p. 787, and gave rise to the following discussion:—

The PRESIDENT said the paper had interested him very much, but he observed that the quantity operated upon was very small, and therefore many of the reactions mentioned as differing from those of atropine, might possibly be accounted for by the product obtained not being quite pure. He had worked a good deal on atropine and knew how difficult it was to get it to crystallize unless it were perfectly pure. He did not say that the alkaloid was atropine, because they now knew that daturine and other alkaloids of the same class, which were once supposed to be the same as atropine, were different, and it might be the same with this, but they could not feel quite certain about the matter without further experiments.

Dr. PAUL said some portion of the alkaloidal substance mentioned by Mr. Gerrard had been forwarded to him, and he had submitted it to some examination. He could confirm almost entirely Mr. Gerrard's statements with regard to the reactions and general chemical behaviour of this substance. It was in the state almost of a treacly mass, and so far as he had been able to work with it at all it refused to crystallize. There was so much vagueness about the chemical characteristics of atropine that it was somewhat hazardous to say whether this was identical with it or not; but his own opinion was decidedly that it was not. It was totally destitute of any signs of crystallization, and by any means he had been able to apply to it could not be provoked into crystallization. Again, its solubility in water was far in excess of that of atropine, and the alkalinity was also very marked, the reaction being almost as strong as that of a weak solution of caustic soda. Of course it was useless to attempt the combustion of such a material. He had therefore attempted to obtain a compound of it, but had hitherto failed in obtaining anything which could be called definite. The platinum chloride and the iodohydrargyrate were both oily, viscid masses which were very unpromising to deal with. The compound with auric chloride as he first obtained it was also of the same character, and it was not until after several trials that he succeeded in getting a crystallization of this compound. At first there was a considerable tendency to a reduction of gold, and on that account it was necessary to evaporate without heat. In looking at the solution on the previous day he noticed that there was a distinct crystallization

* See *Pharm. Journ.* [3], vol. vi, p. 566.

commencing, and that morning he found this was gradually developing as the evaporation went on. There was every reason to believe, therefore, that a definite crystallizable auric chloride compound was to be obtained from it, and that they might expect to get some definite data as to the composition and the relation of this alkaloid of atropine.

Mr. HOLMES said he had received a note that morning from Mons. A. Petit, of Paris, which might throw some light on this matter. M. Petit said that this alkaloid appeared to be different from atropine, being crystallizable with great difficulty, and ten times more soluble in water. He did not think this great solubility was due to impurity, because what he had operated with had been twice treated with ether in the presence of an excess of bicarbonate of potash. Aqueous solutions of this alkaloid were fluorescent and dichroic, being yellow by transmitted, and bluish green by reflected light. The double chloride of gold and of the alkaloid crystallized well and would permit of its being analysed and its constitution determined. The alkaloid was easily obtained by treating an aqueous solution of the extract with bicarbonate of potash until an alkaline reaction was produced, and then agitating with ether. He had obtained 1·10 gramme of the alkaloid from 60 grammes of the extract. Mr. Holmes further stated that Dr. Bancroft, of Brisbane, who discovered the properties of duboisia, was present, and he hoped would say something upon it.

Dr. BANCROFT was glad to find that the results just described agreed so well with those obtained by the chemist in Brisbane, who had worked hard at this question for six months for him. He could make no crystals, except that occasionally a chance crystal or two would appear. At first it was thought the extract had decomposed, and on one occasion the chemist worked with 50 lbs. of fresh leaves, but the result was the same. He (Dr. Bancroft) was not sure that the physiological action would not be found to be different from that of atropine; it was certainly much stronger, for the watery extract alone was equal, weight for weight, to atropine. One very peculiar physiological effect was this. If a dose were given to a dog subcutaneously, he would walk straight forward, and if he got into a corner he would struggle and cry for a long time, and paw at the walls, but it appeared never to occur to him to turn round. The same thing would happen if he got mixed up with the legs of a chair; he would fight with them for some time before he got out, and seemed to have no notion of going anywhere but straight forward. On cats, however, it had not this effect. *Pituri* was another very remarkable drug which he hoped before long to be able to bring before the Society. He believed it had more curious effects than any other drug. The natives chewed it before undertaking anything desperate, such as a fight. It was a strong poison, and a single drop of the prepared drug would kill a cat in a minute with symptoms very like tetanus. It was very difficult to get; the natives carried it about in bags ground up into a kind of powder, and traded with it in the interior. He had brought to this country a few ounces of the extract, but he hoped to get some seeds and grow the tree. It grew on the borders of Queensland, about a thousand miles from where he lived, and since 1872 he had been trying to get seeds and had not yet succeeded; but he still hoped to do so, and if he were able to cultivate it he had no doubt that a very curious medicine, which might prove of great value, would be obtained.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The twelfth general meeting was held at the Royal Institution, March 28, 1878. The President, Mr. T. Fell Abraham, in the chair. The minutes of the previous meeting were read and signed.

The donations to the library were duly acknowledged.

Mr. J. H. Owens, 52, St. Anne Street, was unanimously elected an associate.

The following paper was read on—

LIQUID DIFFUSION AND DIALYSIS.

BY CHARLES SYMES, PH.D.

The publication of Professor Graham's masterly paper on "Liquid Diffusion Applied to Analysis"* in which he not only brought together such meagre and disconnected facts as were already known concerning it, but added much original matter, the result of a large number of experiments and careful observations, establishing the whole on a sound and scientific basis, directed special attention on the part of chemists and physicists to the subject. Seeing the extensive field of inquiry which this appeared to open up it is rather surprising that so comparatively little has resulted from the investigations by others; and here we are, after sixteen years, with, as far as I am aware, very few new facts added and but little practical benefit accruing therefrom. It will not require much logic or argument to prove that this must be due either to the unsatisfactory nature of the process itself or the imperfect work of those who followed Graham in its investigation; be that as it may, one after another appear to have dropped the inquiry for an apparently more profitable, more interesting, or less worked field of inquiry. On reading the paper I was impressed, as doubtless were others, with its probable utility in toxicology, and in my own small way commenced a series of experiments in that direction which were not attended with a reasonable amount of success, and I arrived at the conclusion (correctly or otherwise) that as a means of separating small quantities of poisonous substances from large quantities of organic matter with which they were mixed and more or less combined, the process was not superior, and in most instances not equal to, already recognized methods; nevertheless I gained a conviction that it was a subject capable of further development, and want of time is my only reason for not having prosecuted the inquiry still further until a more recent date. I bring before you (prematurely perhaps) the following remarks, hurriedly put together, in the form of a paper, because our president had kindly placed this evening at my disposal for a short lecture on sound, accompanied by an exhibition of my phonograph, but up to the present it has stubbornly refused to give anything more than a faint mimicry of an articulate sound and that with some uncertainty.

Graham divides all substances into two classes; the first, such as sulphate of sodium, nitrate of potassium, sugar, etc., being more or less crystalline in character, readily soluble, and highly diffusive, are called crystalloids. The second, such as hydrated peroxides, silicic acid, gum, starch, tannin, gelatine, vegetable and animal extractive matter, etc., being marked by their low diffusibility, comparative inertness as regards chemical action, gelatinous character of their hydrates, and feebleness with which they are held in solution. Physically the first class possess more or less static, the latter dynamic, characters, always in a condition of change they readily pass into the pectous form, and from their plastic and impressible character they are permeated by crystalloids almost as readily as water itself; to this latter class the name of colloid has been given. In illustration of their permeable nature I have here a tall jar of gelatine in a hydrated condition, the lower stratum (which has been coloured red to distinguish it) forming one-fifth of the whole, contained when introduced five per cent. of sodium chloride. This was allowed to solidify, and on it was poured a cold solution of gelatine only, near its point of solidification, a tube funnel being used to prevent any disturbance or admixture of the two; it quickly set, and now at the expiration of five days we will examine it to different depths, and I doubt not but a little solution of nitrate of silver will reveal the fact that the chloride has risen at least through

* Philosophical Transactions, Part 1, 1862.

one half of the colloid without any change in the position of the latter. Here is another jar in which the sodium chloride has been replaced by potassium dichromate; in this we have ocular demonstration of the height to which the salt has risen by diffusion. No fixed line of demarcation exists between these two classes of bodies, but a peculiar property exists between any two strictly colloidal bodies of impenetrability to each other. What is it now which causes this denser body, in opposition to the laws of gravitation, to rise up through the lighter one in this remarkable manner? Can it be a special diffusive force existing in the crystalloid? We find that though possessed of chemical activity this class of bodies are physically static and more or less unchangeable. Not so the colloid; its molecules are loosely held together, its existence is a constant, though somewhat slow metastasis; and this has led me to the conclusion that it is no new force but a special form of a well recognized one; that it is in fact *molecular capillarity*, the molecules of the colloids being so feebly aggregated that the molecules of the crystalloid are drawn up between them, just as a fluid might be drawn up in a fine capillary tube, the only difference being that in the former we have capillarity between molecules, in the latter between masses of matter.

In gases we have Graham's well-known law that "the rate of diffusion is inversely as the square root of the density;" with the less mobile fluids under consideration no such law obtains. Hydrochloric acid is found to be amongst the most diffusible of bodies, and its time for the diffusion of a given quantity being taken as 1, that for a similar quantity of sodium chloride is found to be 2·33, for sugar and magnesium sulphate 7. As a rule, chlorides diffuse more rapidly than sulphates or nitrates; potassium salts more readily and rapidly than the corresponding ones of sodium. From these and other facts I have ventured to deduce the following law, which will doubtless be found subject to some, it might be many, exceptions, viz.:—*That the rate of diffusion is directly as the solubility of the crystalloid in the liquid atmosphere in which it is diffused.*

Diffusion in alcohol is much slower than in water; indeed alcohol is itself a crystalloid, although lower in the scale than the substances we have been dealing with. Here is an arrangment for diffusing coloured alcohol through an aqueous solution of sugar. Seeing that it is assisted by its lesser gravity it rises very readily, first forming small vortex rings and then spreading out into a laminated and finally arborescent appearance.

Let us now pass on to the second part of our subject, which has a more practical bearing on pharmacy, viz., dialysis. Certain substances possessing colloidal properties, such as hydrated metallic oxides, silica, alumina, etc., which under ordinary circumstances are insoluble in water, are by this means rendered perfectly soluble, but they are held in solution by a very feeble force and in consequence readily pectise or form an insoluble jelly.

The process consists, as you will be aware, of placing a liquid, in which the colloid is held in solution by the presence of a crystalloid, over a floating diaphragm or septum of a colloidal nature, when the crystalloid passes through and diffuses itself through the watery medium beneath, whilst the colloid (otherwise insoluble) is retained above in solution. The septum first recommended and that generally used is parchment paper, and Graham's view as to the rationale of the process is that it has no power to act as a filter and resist the passage of the fluid as a whole, but is permeated by crystalloid molecules capable of de-hydrating it; so that the process is one of continual hydration and de-hydration of a wetted membrane. Now if this view is correct, no such septum would be suitable for dialysis in any other than an aqueous medium and the process would exclude all substances soluble in alcohol only. But this theory has been challenged by M. Guignet, who obtained satisfactory results by the use of unglazed earthenware as a septum. Flat battery cells answer remarkably well for this purpose and a series of these arranged in a trough make a convenient and efficient dialyser. I have varied the septum by using asbestos cardboard, split sheepskins, thick French filtering paper, and also fine muslin saturated first with a solution of gelatine and subsequently with a solution of chrome alum, which renders the gelatine insoluble; at present, however, it would be premature to report on their comparative value. I have also substituted a hoop of glass for the ordinary one of gutta percha as being more cleanly and not liable to get out of shape, which is frequently the case with the latter after being a short time in use.

The chief preparation which has come into use as a medicine is dialysed iron. This, which is some ten or twelve years old, at least as a pharmaceutical preparation, has during the last few months been quoted in medical journals as a new or quite recent remedy. That it has been so largely prescribed of late is due I feel satisfied to an erroneous idea on the part of the medical profession as to its mode of preparation. Dialysis is performed either for the sake of the diffusate (the substance passing through) or for the dialysate (the portion remaining behind); these two have been more or less confused, and dialysed iron is not unfrequently prescribed under an impression that it will be readily absorbed into the system because it has passed through wetted membrane. Now the only merit possessed by dialysed iron, as far as I am aware, is that it is tasteless. But were it not that its condition becomes changed in the stomach it would pass through the system unabsorbed; but that some change does take place is certain, and at the request of several medical men I have undertaken to ascertain as far as possible to what extent it does so. The usual dose is one teaspoonful containing 3 grains of oxide of iron, and as far as my experiments take me at present, it is probable that the whole of this becomes converted into a crystalloid condition (chiefly perchloride) by the action of the gastric juice. A convenient and satisfactory working formula for its preparation is as follows:

Hydrated peroxide of iron is prepared by pouring, say four pints liquor ferri perchlor. B.P. (not the strong) into one pint liquor ammoniæ previously mixed with three pints of water (the exact quantities will vary somewhat according to the acidity of the iron solution), well wash the precipitate so obtained and drain on a calico filter; this is now dissolved to saturation in liq. ferri perchlor. fortior by the aid of a gentle heat. The necessary quantity will vary from half a pint to nearly a pint. The solution so obtained is placed in the dialyser to the depth of half an inch, and the latter is floated in a vessel of water where there is an arrangement for keeping up a constant flow underneath the parchment or other septum. The process is continued until the solution in the dialyser is almost or entirely free from styptic taste, and the strength should be such that on evaporating 100 grains in a tared capsule five grains of ferric hydrate remain, in other words it should be a five per cent. solution. In the *Canadian Pharmaceutical Journal* for October Mr. E. B. Shuttleworth writes an excellent paper on this subject, indicating a thoroughly practical acquaintance with the processes; he there gives two formulæ, one of which as nearly as possible accords with the one I have given. It is usual to place the dialyser on still water which is changed daily, but dialysis (a slow process at the best) is certainly facilitated by constant change of the liquid into which the diffusate passes. This I first proved experimentally in the following manner. Into two small dialysers, each possessing a superficial area of 100 square centimetres, was placed 100 c.c. of a two per cent. aqueous solution of common salt and gelatine; one of these was set to float on a litre of distilled water at rest, the other in such an arrangement as I have here, where a slow but constant current of water was passed under the diaphragm by means of capillary attraction. When one litre of water had flowed through, nearly the whole of the salt had been separated from the gelatine, whilst in the dialyser over the same quantity of still water about 30 per cent. of the salt remained. The experiment was repeated with similar results.

In France a successful application of dialysis is made to sugar refining. It is a well known fact that partially refined beet sugar contains a large percentage of potash and other salts. Now these (and the potash in particular) are not only objectionable as an impurity, but tend to prevent the sugar from crystallizing; its separation being somewhat difficult.

A saturated solution of sugar is placed to a shallow depth in large dialysers and a rapid current of water is made to flow underneath. So greatly superior is the diffusive power of the potassium salts to that of the sugar that the former is largely got rid of without any considerable loss of the water; indeed it is found an economic process for the purpose. Where the process is performed for the sake of, or with a view to preserving the diffusate, a large quantity of water cannot be used and the time occupied is increased. The purer the dialysed product the more readily does it spoil. Dialysed iron, as usually prepared for pharmacy, contains a small quantity of basic chloride, and it is this which enables it to remain unchanged for some length of time. Caramel might be dialysed till its colouring properties for a given quantity are considerably increased; but unfortunately it will not keep when thus purified more than a few days and will sometimes pectise in a few hours.

Dialysis is a process going on to a vast extent in nature, and is, I believe, capable of further development in the arts.

A lengthy discussion on the subject followed, in which the President, Messrs. A. C. Abraham, Michael Conroy, F.C.S., A. G. Haddock, Edward Davies, F.A.S., A. E. Tanner and others took part. Dr. Symes replied to questions asked and on the points of the discussion. A hearty vote of thanks to the author, which was carried by acclamation, brought the meeting to a close.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

March 30th, Anniversary Meeting, Dr. Gladstone, F.R.S. President, in the chair. The President in his address, after referring to the general history of the Society during the last twelvemonths, mentioned that the whole subject of the bye-laws had received the very careful attention of the council. The verbal alterations recommended were very numerous but the real alterations affected mainly the mode of electing fellows and of appointing auditors. The constitution of the publication committee has been entirely altered; it will for the future consist of six members in addition to the five officers of the Society. Various arrangements have been made for expediting the publication of papers, and the editor has made a successful effort to bring the work of abstracting up to date. This has involved the printing of an extra number of the Journal, which is on the point of being issued. As the duties connected with abstraction are increasingly laborious the Society has determined to appoint a sub-editor and has been fortunate in securing the services of Mr. C. E. Groves for the post.

The "Research Fund" now amounts to about £4000. Already two papers resulting from assistance rendered by its means have been received, viz.:—"On some points in Chemical Dynamics," by Dr. Wright and Mr. Luff, and "On certain Poly-iodides," by Mr. G. S. Johnson. It is to be hoped that many other chemists, especially those to whom the pursuit of chemistry has become a source of wealth, will contribute handsomely to this important fund.

Since the last anniversary meeting an independent institute of professional chemists has been formed and has been incorporated (October 2nd), under the title of the "Institute of Chemistry of Great Britain and Ireland," with the two following objects:—*a.* To promote and encourage a thorough study of chemistry and all branches of science allied thereto in their application to the arts, to agriculture, to public health, and to technical industry. *b.* To adopt such measures as may be necessary for the advancement of the profession of chemistry, and particularly for the maintenance of the profession of the consulting and analytical chemist on a sound and satisfactory basis. It will thus be seen that the two Societies are perfectly distinct, but may be mutually helpful; the President therefore wishes all prosperity to the new Institute.

Sixty-five papers have been read before the Society during the past year, and two lectures have been delivered. There are at present 965 fellows, 49 have been elected during the past year. The Society has lost by death one eminent foreign member, M. Regnault, whose name is so well known by his researches on specific heat, etc., etc., as well as R. Apjohn, late Prælector of Chemistry in Caius College, Cambridge, who died in his thirtieth year from the results of a fall from a bicycle; J. J. Griffin, the founder of the well known firm of chemical instrument makers; W. Gossage, alkali and soap manufacturer; J. Hall, late Science Master at the City of London School; E. L. Koch, M. Murphy, Dr. H. M. Noad, late Professor of Chemistry at St. George's Hospital, author of a 'Manual of Electricity;' and E. F. Teschemacher, of the firm of Denham-Smith and Teschemacher.

A vote of thanks to the President for his able address was proposed by Mr. De La Rue.

Dr. Frankland, in seconding the vote, referred to the establishment of the Institute, stating that he was at first anxious to have it founded in connection with the Chemical Society. This was found, however, to be impossible, and he was at one time afraid that a separate body might injure the interests of the Society. He was glad to say that his fears were groundless, and he had every reason to believe that the founding of the Institute would furnish the Society with many welcome fellows.

The vote of thanks was then put and carried.

The President, in returning thanks, said that he had endeavoured to do his best for the Society, and thanked the members of council, the officers and fellows for their constant and unremitting kindness to himself.

The Treasurer, Dr. Russell, then gave a statement as to the condition of the Research Fund.

At the conclusion of the report it was announced that Mr. De La Rue had offered a sum of £100 to be given to the Research Fund, on the condition that it was to be devoted to any one important research.

A vote of thanks to the Treasurer for his report, and to Mr. De La Rue for his handsome donation, was proposed by Dr. Odling, seconded by Mr. Neison, and carried unanimously.

The Treasurer then read his report of the condition of the funds of the Chemical Society.

A vote of thanks to the Treasurer for his lucid and satisfactory statements was proposed by Mr. Abel, seconded by Mr. E. Riley, and carried unanimously.

Dr. Odling then rose to move that the report of the President be received.

Mr. Neison, in seconding the motion, referred to the want of reagents in the preparation room, and the desirability of distributing the general index of papers to all fellows free of charge. He also made some remarks as to the present mode of electing and admitting fellows.

In reply, Dr. Russell said that there had been no demand for reagents, but if such a demand did arise there would be no difficulty in supplying them.

Dr. Armstrong also said that he always made a point of communicating if possible with authors, so as to have anything they might want ready for their use.

Mr. Crookes then proposed a vote of thanks to Mr. Watts, "our talented and conscientious editor."

Mr. Howard seconded the vote, which was carried unanimously

Before electing the council, etc., Dr. Odling asked the Secretary for information as to an alternative, which he ventured to designate an opposition list, which had been circulated; it was such an exact copy of the list issued by the council that many fellows thought that both lists had come from the same source.

Dr. Armstrong replied that the persons issuing the list were unknown to him.

Mr. Riley thought that the name of the fellow who issued the list ought to have been attached to it, to prevent mistakes.

Mr. Neison said that he had issued the list on his own responsibility, and that he much regretted if anyone had been deceived by it. He thought as he had proposed Mr. Kingzett at the last meeting that everyone would have known where the list came from, besides an additional name on the list would have rendered the balloting-paper illegal.

The election of officers was then proceeded with, Messrs. Beale and Thomson having been appointed scrutators. The following were elected:—President, J. H. Gladstone, Ph.D., F.R.S.; Vice-Presidents, F. A. Abel, C.B., Sir B. C. Brodie, W. De La Rue, E. Frankland, A. W. Hoffmann, W. Odling, Lyon Playfair, A. W. Williamson, T. Andrews, W. Crookes, F. Field, N. S. Maskelyne, H. E. Roscoe, R. Angus Smith; Secretaries, W. H. Perkin, H. E. Armstrong; Foreign Secretary, Hugo Müller; Treasurer, W. J. Russell; Council, Lothian Bell, M. Carteighe, A. H. Church, W. N. Hartley, C. W. Heaton, D. Howard, G. Matthey, E. Riley, W. A. Tilden, R. V. Tuson, R. Warington, C. R. A. Wright.

The meeting then passed the bye-laws as amended by the council with a few verbal alterations.

Parliamentary and Law Proceedings.

Opium Eating Extraordinary.

Samuel Wilkinson, a young man, not quite twenty, was on Friday, March 29, brought up before Mr. Huntriss and Captain Rothwell, at the Halifax Borough Court, on a charge of attempting to commit suicide.

The chief constable stated that the young man was an articled clerk to a solicitor, and was apprehended on Thursday night on a charge of attempting to commit suicide, but he had made inquiries since, and was under the impression that he had no such intent. It appeared that he was an opium eater, and could take 180 grains, which would be sufficient, he believed, to kill sixteen people. He went to a chemist's shop in Northgate where he bought some cocculus indicus as a substitute for opium, and took it on Wednesday night, in consequence of which a man with whom he lodged fetched a police-officer. He was found in a bad state, and taken to the Infirmary, but discharged on Thursday.—The Bench dismissed the case.—*Bradford Observer.*

Singular Action Against Mine Owners.

In the Nisi Prius Court at the Cornwall Assizes on March 27, before Sir James Fitzjames Stephen, a case of considerable importance to the owners of mines was tried. An action was brought by Mr. Reynolds, of Trevenson, near Pool, to recover £50, the value of a horse said to have been killed by means of arsenical deposits coming from the arsenic burning houses of East Pool Mine, and falling upon the grass in the field in which the animal was grazing. The stomach of the horse was analysed, and grains of arsenic were found in it, and evidence was called to show that there were not those arrangments existing in the mine which would condense the arsenic gases into arsenious acid, or the sulphuric acid, but that these escaped from the shaft, and poisoned the surrounding vegetation. The mine adventurers were made to be defendants, and they produced evidence to prove that no appreciable quantity of arsenic escaped, and that everything was done that could be done to prevent the outflow of any poison. It was also argued that there were scores of these works in the country, and that if they were subject to actions of this character, no mine could go on making arsenic or raising the tin stone from which the acid was obtained. Dr. Otland and Mr. Collins, the county analyst were examined in support of the defendants' case, and the jury gave a verdict for the defendants.—*Daily News.*

Alleged Adulteration of Soda Water.

On Wednesday, March 27, at the Borough Police Court, Humphrey Wood, South Street, Huddersfield, aerated water manufacturer, was charged with having, on the 8th inst., sold to the Sanitary Inspector three bottles of soda water which was not of the nature and substance demanded by the purchaser.—Mr. W. Armitage appeared for the defendant.

Mr. Kirk, the Sanitary Inspector, stated that on the day in question he went to the defendant's shop, at the corner of New North Road and West Parade, and asked to be supplied with three bottles of soda water. The defendant told him he had none there, and requested witness to accompany him to his manufactory in South Street, which he did. There the defendant supplied him with three bottles of soda water, and he offered the defendant a part, but the defendant said he did not require it, as he had plenty more in the works. Witness afterwards submitted the soda water to Mr. Jarmain, the borough analyst, who gave a certificate, showing that the sample he had analysed consisted of a solution of carbonic acid gas and there was no bicarbonate of soda in it at all. The solution contained lead amounting to about one-fortieth part of a grain, but it was in too small a quantity to have any injurious effect on health.—Mr. Jarmain gave evidence to this effect.

Dr. Cameron, the medical officer of health, stated that proper soda water should have thirty grains of bicarbonate of soda to each pint. If he ordered soda-water for a patient, he should expect to have certain definite actions as a result of the drug—actions which he never could expect to have from simply aerated water.

For the defence it was urged that the affair was the result of an accident, pure and simple.

Mr. Armitage explained the mode in which soda water and ginger beer were made, and said that after the ginger beer had been made some of the pure filtered water must have been left in the receiving pan, and when the soda water making was resumed the pure water got charged in the usual way, and was put into the soda water bottles without really having any bicarbonate of soda in it.

The defendant gave evidence to the effect that he bought the best bicarbonate of soda, giving 1s. per pound for it, and he put 12 ounces to 125 gallons of water. He said he had never manufactured soda water without soda knowingly, and he never knew an accident similar to this.

The bench fined the defendant 20s. and the expenses, but said they did not believe that the defendant had any intention of being dishonest, the affair having arisen more from carelessness that anything else.—*Leeds Mercury.*

Reviews.

Papers on the Plant Gynocardia Odorata, from which the Chaulmoogra Oil is obtained. By R. C. Le Page. Trübner and Co. 1878.

This little pamphlet is a compilation of papers relating to Chaulmoogra Oil from various sources. It is practically an advertisement of Chaulmoogra Oil, for on page 6 the author states, The first object of myself and those associated with me in making the sale of this oil a commercial adventure, will be to import it of undoubted purity." In the introduction it is stated that "the purport of this pamphlet is to bring together all that has yet appeared in scientific and other publications of the plant from which the Chaulmoogra Oil is obtained." Instead of containing a *précis* of all that is known of the plant, the author has simply extracted the papers as they stand, from various works such as the *Pharmaceutical Journal*, 'Pharmacographia,' etc., with the result of leaving the non-botanical reader very much puzzled as to what family of plants *Gynocardia odorata* really belongs. Thus on page 10 it is referred to Pangiaceæ; on pages 18 and 22 to Flacourtiaceæ; and on page 23, to Bixineæ, and to tribe Pangieæ (ord. Bixinæ). There can be doubt that the oil really possesses valuable properties, and that it has been found useful in leprosy, various skin diseases, and the incipient stages of consumption, and that it is well worthy of extended trial in this country. If the oil does come into use here Mr. Le Page's pamphlet will doubtless prove useful for reference. A few explanatory remarks, and a summary of the botanical details would, however, have much enhanced the value of the pamphlet.

New Commercial Plants, with directions how to grow them to the best advantage. No. 1. By Thos. Christy, F.L.S. London, 1878.

The author of this little pamphlet is known as an energetic contributor to the introduction of useful plants into new countries. Though it must be looked upon primarily in the light of a trade advertisement, it will be found to contain some useful information on the cultivation of the Liberian Coffee (*Coffea liberica*, Hiern), the West Tropical African Rubber Tree (*Landolphia florida*, Benth.), and Turkish Tobacco. The first-named bids fair to supersede the ordinary coffee in tropical countries, as it can be grown at the sea level, and yields a larger crop of berries, which, it is said, are also of a finer flavour; moreover the destructive coffee-fungus is not known to attack it. The Government of Liberia has recently placed a prohibitive export duty on the seeds and young plants, but the species is not confined to the small portion of West Tropical Africa occupied by that Republic. The pamphlet is illustrated by copies of the plate illustrating M. Hiern's original botanical account of *Coffea liberica* in the 'Linnean Transactions,' and of that accompanying the description of *Landolphia florida*, in Kotschy's 'Plantæ Linneanæ.'

Notes on the Treatment of Skin Diseases. By Robert Liveing, A.M. and M.D. Cantab., etc., etc. Fourth edition. Longmans. 1877.

When the first edition of Dr. Liveing's little work appeared it was very favourably received, and the fact of a fourth edition being so soon issued is convincing proof of the estimation in which it is held.

Clear and concise in its description and treatment, well printed and neatly bound, it constitutes a portable clinical guide, useful to practitioners and students. An index appears for the first time in the present edition, and adds materially to its value.

The collection of formulæ—from various sources—is a good one, and includes many convenient recipes for administration and application of medicaments, but we fail to notice the production of any novelties calling for special remark.

BOOKS, PAMPHLETS, ETC., RECEIVED.

Cooley's Cyclopædia of Practical Receipts. Sixth Edition. London: J. and A. Churchill. Parts 1 and 2. From the Publishers.

Dispensing Memoranda.

We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be considered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.

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[92]. In answer to T. F. E., I beg to state that I always use the heavy oxide (B.P., page 201), when magnesia is ordered.

A. Billington.

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[93] This is a case of undue concentration and cannot be dispensed satisfactorily, owing to the resin of the bark being precipitated. The only way I see out of the difficulty is to send out the solution of iodide in one bottle and the bark in another, with full directions for mixing each dose. If the prescriber could not be communicated with, a note should be made on the prescription for the guidance of future dispensers.

George Brown.

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[94]. Will some reader kindly give the best excipient for making carbolic acid pills?

Dispenser.

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[95]. I had the following prescription handed to me this week to be dispensed and am fairly puzzled by the second article. Can you or any of your readers enlighten me?

℞ Hydrarg. Bichlor . . . . . gr. iv.
Tr. Sap. Virid. Co. . . . . . ℥ss.
Aquæ . . . . ℥iss.

For external use night and morning.

I may add it was written in New York, but I cannot find any such article in the U.S. Pharmacopœia.

G.

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[96]. Will some one kindly give me a formula for the following prescription?

Ol. Hydrarg. et Morph. . . . ℥ss.
(Ten per cent.)

A. S. R.

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[97]. Will you kindly insert enclosed in the Dispensing queries?

℞ Potassii Bromidi,
Potassii Bicarb. . . . . . . āā ℥ss.
Sol. Taraxici . . . . ℥j.
Aquæ . . . . ℥iij.

Sig. Shake the bottle and take two teaspoonfuls three times a day in water after food.

What is meant by Sol. Taraxici? Does not "shake the bottle" seem to indicate something thicker than Succus Taraxici, perhaps a solution of the extract? Some of your correspondents may perhaps say what is intended, and oblige,

Glasgow, March 30, 1878. Euryowie.

Notes and Queries.

[581]. IRISH SLATE (LAPIS HIBERNICUS).—The following is the description of this Irish slate as given in Gray's Supplement:—"An argillaceous slate, said to contain iron and sulphur. It is found in different parts of Ireland, in masses of a bluish-black colour, which stain the hands. When powdered, it has a light bluish tint, which becomes darker with keeping. When exposed to the fire it acquires a pale red colour, and emits a sulphurous smell. The powdered slate is sometimes administered by the poor as a remedy for internal bruises."—F. P.

A similar answer has been received from J. F. R.

[584]. PREPARED SILICA.—Can any reader inform me where the fine levigated silica is to be obtained for cleaning plate, lenses, etc.?

A. D.

[585]. BALSAM OF ANISEED.—Would any reader be kind enough to inform me of the formula for balsam of aniseed as I am continually asked for it? With dose and how sold.

A. B.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE EXAMINATIONS.

Sir,—I have been expecting that some senior member of the trade in Scotland would take up in the Journal the defence of Scotch chemists and druggists against the literary missiles projected weekly by some from the south of the Tweed. Mr. Duncanson, Stirling, has been harshly criticized by some of your correspondents, and I am sure no one with any knowledge of that gentleman's status in the trade would venture to attribute to him motives having a tendency to introduce a lower class or a less educated set of youths to it. Our friends south of the Tweed apparently know very little of the exact position occupied by Scotch chemists and druggists, else we would have heard less about their "standard of perfection." The only gentlemen who have ventured to defend the position are Mr. Fairlie and Mr. Mackay. The latter gentleman is, I presume, a "real Mackay," and he deserves the best thanks of the Scotch druggists for his defence of them and the Edinburgh Examining Board.

It is intolerable to have slurs continually cast at this Board, and it appears to be only a *ruse* to get all the examining machinery removed to London, to further enrich and elevate the institution there and endeavour to lead members of the trade to believe that nothing is genuine unless what emanates from that great centre direct. Scotch druggists have managed their trade affairs very well in the past, and I can see no reason why the same may not continue. Of course the centralization system and tendency is in active operation, and it may be a "wire pulling" dodge, these insinuations against the Scotch Board of Examiners. However this may be, I say, let the examiners take courage and the Scotch chemists and druggists do the same, and insist on being left free from the literary projectiles from across the border. I have not one word to say against the examinations, but am rather pleased to know they are so fair and practical. We in Scotland cannot get genteel apprentices, as such prefer being bankers' or lawyers' clerks, for what reason I do not understand unless the short hours and the fact of being in an office instead of a shop. Provincial druggists in Scotland do not, as a rule, either from the nature or extent of their trade, keep a porter, and messages and the like have to be done by the younger apprentices. It will be at once understood, then, that we have to take our pupils from the working class, but not from that stratum of it which supplies "errand boys." It is almost impossible for a Scotch tradesman to afford keeping his son at school beyond the time he is between thirteen and fourteen years of age, which is the very time to set a lad to the study of higher education. Now what remains to be done—and I do it myself and can recommend it to others—is to enter the lad immediately he leaves school and arrange for him prosecuting the higher branches at certain hours under the same master to whom he is accustomed. I have found the plan work well, and those who have left my service to fill assistantships have all passed their Preliminary examination a year or more before their apprenticeship was finished. Of course they did not attend school as ordinary schoolboys, to put in the time and shirk their lessons when too lazy to learn them, but as with a well defined object in view, and by my interesting myself in their school work and encouraging them therein I have had the best results. It is a pleasant thing to turn out a young man well grounded in the rudiments of a business by which he is to earn his daily bread, and I feel that it is the duty of all those who train apprentices to provide for their passing the Preliminary examination before they are sent out as assistants. It may be that at the present time there is a little too much made of the scientific branch of our trade and too little heed given to being really useful and valuable assistants on the part of young men, but this is merely a personal matter, and employers usually succeed in weeding out suitable and profitable assistants only.

I hope these remarks may be taken in good part, and that they may assist in leading to good results is the sincere wish of

WM. R. KERMATH.

St. Andrew's, Fife, April 2, 1878.

THE PATENT MEDICINE QUESTION.

Sir,—In my opinion the only remedy to prevent patent medicines being sold by grocers, etc., is to have the sale of them restricted to registered chemists and druggists, and let the licence be increased. Here, in this city we have many grocers selling patents at $9\frac{1}{2}d.$ and 2*s.* 3*d*, sweet nitre, camphor, senna, and other drugs at the same proportionate low price, and injuring the fair legitimate trading of the chemist to a fearful extent; in fact, the sale of patents to our customers is becoming quite an unpleasant affair. Customers inquire how is it they have to pay 1*s.* $1\frac{1}{2}d.$ for a box of Cockle's pills at the chemist's while at the grocer's they only pay $9\frac{1}{2}d.$; any explanation is received with a "peculiar shrug of the shoulders."

Another source of mischief is, we unfortunately have among us some wholesale houses who do not hesitate to supply these and any other parties not connected in any way with the trade, and then they have the cool assurance to wait upon the "poor chemist" and solicit his orders, knowing they are at the very time supplying his "unfair" "cheap," and I may add, "illegal" rivals. Now, sir, I ask, is such a mode of doing business fair?—for my part I consider it scandalous. I should be glad to see a better "*esprit de corps*" spring up among both retail and wholesale chemists. I enclose you, sir, a list of prices at which patents are sold by these "cheap jacks" in this city.

Trusting the time will soon return when fair and legitimate trading will be the order of the day.

EXCESTRENSE.

Exeter, April 1, 1878.

Sir,—A great deal has been said of late with respect to drapers, grocers, hairdressers, printers, etc., selling patent medicines, cutting down prices, and, under cover of the patent medicine stamp, vending all kinds of poisons indiscriminately. This to a very great extent is carried on in this district, greatly to the annoyance of myself and brother chemists. When first commencing business, some six years ago, I strongly objected to lowering the prices peculiar to the district (for every county varies a little in a few things) of anything, as is done at the present time, but suffered so much from want of legitimate patent medicine retail, through a certain printer, nearly next door, who keeps the stamp office, cutting down the prices to 1*s.*, 2*s.* 6*d.*, 4*s.*, and so on, *i.e.*, taking off, as he said, the stamp duty, making the public believe he had not such duty to pay since he was the vendor by appointment of such stamps. My customers for 2*d.* of hair oil, etc., would bring in their hands 11*s.*

chlorodyne obtained of Mr. Printer, and for which was paid 10s. This sort of thing so annoyed me that in self-defence I commenced to sell below him and advertised well; now I may say I do a fair (but must own not legitimate altogether) amount of patent medicine trade. This is the only remedy, so far as I can see at present, left to us poor grumbling chemists; but so soon as an Act can be passed, either for the chemist's exclusive right of vending patent medicines or compulsion of selling at proprietors' advertised prices, I for one shall exclaim well done. Until then, laudanum, opium, etc., etc., will be sold, as it is done in this neighbourhood, to anybody and everybody by any one who pays 5s. for a licence, and under cover of the patent medicine stamp by some such name as So and So's opiate, opiates, mass, etc.

PATENT.

Sir,—I see in the Journal of the 30th March, some remarks of "Tento" on the sale of patent medicines by merely licensed persons, and no doubt what he says is true. Chemists and Druggists have a grievance in that as well as many other respects, and in my opinion it can only be remedied by an Act of Parliament; the country members suffer more, I think, than the town chemists and druggists. Will "Tento" say how, in his opinion, this state of things can be remedied?

No doubt he thinks, with many others, a chemist is to be found in every village; if so, so far as my personal observation goes, I can very soon dispel any such illusion if it exists. In one direction from here there are over seventy large villages besides numerous hamlets, and in all this number there are only eight registered chemists, and these are located in only five of these villages; in another direction from here, though not so large an area, having over forty villages, there are only two registered chemists.

I would ask "Tento" whether he would suggest a chemist in every village? If so, I may tell him that even in the larger of these villages it is not possible for a chemist to live, unless he deals in a most heterogeneous and sundry kind of goods as well as drugs, and in that case he must necessarily encroach upon many other trades,—and what would they have to say to those who want to monopolize the sole trade in drugs?—or would he suggest the "dog in the manger" policy, and neither serve them himself nor let others do so. He surely does not mean to say the public have no rights to consideration in this matter. I think they have, and all who know the country will, I think, agree with me. In many of these villages a person would have to send ten or twelve miles for a box of Cockle's pills, chlorodyne, or any other of this class of medicines. Can he show how this want can be met, as no chemist could (suppose no one else sold any medicine of any kind) live in these villages.

I would suggest an amendment of the Pharmacy Act registering some one, the most intelligent in every village, not only for the sale of patent medicines but poisons as well (what right have we as chemists to cause any persons to send ten or twelve miles for a pennyworth of laudanum or any other needful drug?), and none but registered persons should sell either patent or any other medicines.

Having met the public requirements, the chemists would have a good case to prevent any infringements on their business as chemists and druggists. I feel sure the public must be considered as well as the chemists, and till this is done any Act of Parliament, however stringent, will be a dead letter; the sooner this is understood the better it will in my opinion be for the trade. This I feel sure will never be done till we have a Council who thoroughly understand the country trade, and I would suggest all candidates for seats on the Council, as I did a year ago, should state their views. No one should, I think, vote for any member whose views he does not know. This is well put by a Provincial C. and D. this week, and deserves the consideration of all members and readers of the Journal. Many changes, I think, must be made the next few years, and the examinations be more practical and less scientific; by all means let those who have good attainments and higher aims get a higher class certificate.

Chesterfield, March 30. A. G.

Safety Matches.

Sir,—It may interest some of your readers to learn that these matches, if quite dry, may be ignited by friction on most hard rather smooth surfaces, such, for instance, as that of a composition mortar.

This fact was communicated to me some two years since by E. Tyler, Esq., F.R.S., but I do not know if he himself first observed it.

I am led to mention it now by the remarks in "The Month" of this week, which seem to show that the circumstance is not, as I supposed, a well known one.

Exeter. W. A. SHENSTONE.

To the Benevolent.

Sir,—I thought to have seen in your obituary a record of the melancholy death of Mr. George Dixon, aged forty-nine, who committed suicide at Bristol, with prussic acid, about a fortnight since.

I would fain enlist the sympathy of any who may be charitably disposed on behalf of his widow, who, left with eight children, is in great pecuniary distress. Five of the children are dependent upon her for support, the youngest of whom is three years old and the eldest thirteen, who has just been removed from school because of the mother's inability to keep him there.

Mr. Dixon was educated at Christ's Hospital. He carried on the business of a pharmaceutical chemist in Southampton for nine years, and during three of those years (1871–3) was a member of the Town Council. In 1864, owing to pecuniary difficulties, he was obliged to resign his business. For two years afterwards he obtained no employment, and during the past sixteen years the family experienced, more or less, much trouble and suffering. I am in a position to state that throughout all those sad years Mrs. Dixon has been most devoted as a wife and a mother. I will say no more than that any subscriptions on behalf of her and her family will be thankfully received by me, and with your permission, acknowledged in the Journal. Mr. Dixon was a freemason, and as members of the craft, and old blues, and pharmaceutical chemists are proverbial for their generous sympathy with distress and suffering, I feel sure I shall not have appealed in vain.

I have already received the following:—

	£	s.	d.
J. B.	1	0	0
H. J. Buchan, J.P.	1	0	0
R. C.	1	1	0
J. H. Cooksey, J.P.	0	10	6
O. R. Dawson	1	1	0
R. D. Ellyett	0	10	6
J. E. Le Feuvre, J.P.	1	0	0
Harry Hunt	0	10	6
H. Osborn, M.D.	1	1	0
W. B. Randall, J.P.	1	1	0
James Spearing	1	1	0
J. Beresford Turner	1	0	0

ROBERT CHIPPERFIELD.

Southampton, March 31, 1878.

"*Alpha.*"—(1) A small form of *Dicranum heteromallum*; (2) *Hypnum cuspidatum*; (3) *Trichostomum tophaceum*; (4) *Ceratodon purpureus*; (5) *Hypnum rutabulum*; (6) *Hypnum serpens*. All letters for the Editor should be sent to 17, Bloomsbury Square.

"*Aniline.*"—The change was probably due to the presence of small quantities of different aniline dyes, the colours of which were developed upon solution in alcohol.

"*A Member.*"—The exemption from serving on juries at present extends only to pharmaceutical chemists. It is probable, however, that in the next legislation on the subject of juries the exemption will be granted to all registered chemists and druggists.

E. H. S.—We think it will be advisable to drop the controversy for the present, as there appears to be a spice of personality mixed up with it.

W. R. Fowler.—Apply to A. Bel and Co., Maiden Lane, Covent Garden.

J. Hessell.—Notcutt's 'Handbook of British Plants,' published at 171, Fleet Street. For instructions as to drying and preserving plants see a paper in this Journal, vol. iv., 3rd series, p. 754.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Reynolds, Mr. Houghton, Mr. Mann, Mr. Wright, Conare iterum, H. J. B., R. S. T.

A FAST GROWING CINCHONA WHICH PRODUCES MUCH QUININE.

BY DR. J. E. DE VRIJ.

The last letter, dated April 6, 1876, which I received from my lamented friend, Mr. McIvor (deceased on June 8, 1876), contained in answer to a question of mine as to "which species of cinchona produces the largest amount of bark in a given time," the following reply:—

"Up to the present time *C. succirubra* has produced in the same period of growth more than twice as much stem-bark as any of the other species we have in cultivation, and *C. pubescens*, Howard, will produce nearly twice as much stem-bark in the same period of growth as *C. succirubra*."

When I received some weeks later a box containing amongst other specimens a specimen of *C. pubescens*, Howard, first renewal, I was much pleased by the possession of a bark produced by such a fast-growing species, variety or hybrid of cinchona, and very anxious to undertake its analysis. Unhappily, however, I have been obliged to postpone the analysis till a few weeks ago, when I contrived to perform it with the following result:—

Total amount of alkaloids in the dry bark, 9·47 per cent., yielding—

5·728 of pure quinine = 7·637 of crystallized sulphate.
0·926 of cinchonidine.
0·937 of cinchonine.
1·111 of amorphous alkaloid.

This result seems to me so satisfactory that it is desirable to know something more about this fast growing cinchona. As Mr. McIvor wrote upon the specimen of bark which he sent me, *C. pubescens*, Howard, I have some hope that the distinguished author of the 'Quinologia of the East Indian Plantations,' Mr. J. E. Howard, may be able to give some explanation about this interesting subject. This hope is based on the following sentence in the 'Quinologia,' page 79:—"I am watching with considerable interest the development of some young plants of the pubescent form sent me by Mr. McIvor, but I must confess that I am led to suspect in these the result of mixture of pollen of other plants of cinchona."

I am inclined to suppose that the fast growing cinchona in question is a hybrid with pubescent form, to which Mr. McIvor, in consequence of his correspondence with Mr. Howard on this subject, has given the name of *C. pubescens*, Howard. A botanical specimen of this cinchona, which was sent to me together with the bark by Mr. McIvor, is actually in possession of my friend, Dr. F. A. Flückiger, in Strassburg.

The Hague.

NOTE ON LUBAN MATI AND OLIBANUM.

BY PROFESSOR FLÜCKIGER.

In the course of the investigations intended for working out the 'Pharmacographia,' the authors were led to the conviction, as stated there (pp. 121, 131, and 135), that the *Elemi* of the mediæval writers agreed with the old gum of the "Ethiopian Olive," and that under the latter name not an *Olea*, but *Boswellia Frereana*, Birdwood, is to be understood. Although it is impossible to prove absolutely the correctness of our view, it was especially the firm belief of my late friend Daniel Hanbury that the *Luban Meyeti* or *Mati*, as described in 'Pharmacographia' (p. 135), was the drug originally designated Elemi. I may only add that I have no new facts to present in support of that opinion, but we had repeatedly considered the question and never met with any statement which would be in contradiction with our suggestion.

Luban Mati, so well known to-day in the East, must very likely have been used there in the remotest antiquity (see 'Pharmacographia,' p. 131). Probably it was sometimes confounded with Olibanum, especially by western authors. Neither Luban Mati, nor any sound resembling it, is quoted in the famous 'Periplus' of the Erythrean Sea (mentioned in Phcogr. 126, 541), but frankincense, Libanos, is enumerated as a product both of Arabia and Somali land. The author of the 'Periplus' alludes to the difficulty of reaching the trees (in the steep slopes, where they are growing?). Yet in the 'Periplus,' another incense, Μοκρότον, is spoken of as an aromatic, θυμιάμα, likewise exported from the Somali coast. Are we permitted to identify this substance with Luban Mati? I think there is some probability in favour of this idea; olibanum and myrrh are expressly and unmistakably mentioned; what else can Mokroton mean than Luban Mati?

It is to be supposed that the physicians and pharmacologists of the famous medical school of Salerno, in the early middle ages, were acquainted with elemi, yet, strange to say, I am not aware of any such evidence. In the history of drugs, elemi is interesting for the curious fact that its name was given in later times to other drugs coming from a far distant country, and that the various kinds of elemi of the new world, and again of the Philippine Islands, are yielded by trees of the order of the Burseraceæ, like Luban Mati. An analogous transmission of an appellation is exhibited by the word Brazil, originally applied to the wood of the Indian tree, *Cæsalpinia Sappan*, now attributed to that of *Cæsalpinia echinata*, and its native country the Brazilian Empire.

I have had the opportunity of getting some new information on the drugs under notice, not relating at all to their history but to their production, and on the other hand, Captain Hunter, now of Aden, has very obligingly supplied me with excellent specimens, not only of olibanum but also of Luban Meyeti. The latter agrees perfectly with that described in the 'Pharmacographia,' except the fragrance, which is more powerful in the fresh drug. The accurate description given in a few words by Mr. Holmes, in *Pharm. Journ.* vii. (4 Nov. 1876), page 383, likewise points out the characteristic features of Luban Mati. Captain Hunter, in the letters he favoured me with, once more states that Luban Mati or Maieti Amshat, is the product of the Yegaar tree, *Boswellia Frereana* of the Somali coast range, and that it is shipped from the ports east of Karam, or Kurrum, 45° 41′ E. long. In the year 1875 to 1876 there were imported into Aden 1928 cwt. of Luban Mati, of which one half went to Egypt and Trieste, one fourth to the Red Sea ports, one eighth to the United Kingdom, and the rest to Bombay and the Dankali (or Danakil) coast, north-west of the strait of Bal-el-Mandel, opposite Yemen. The latter statement leads to the supposition that the Yegaar tree is not growing on the Danakil coast, but only in the extreme north-eastern part of the African coast lands. The external appearance of Luban Mati, of the finest description, is on the whole very different from the various sorts of olibanum, its bulk being not constituted of separate tears, but of stalactitic masses. It is, moreover, different inasmuch as it is an oleo-resin, not a gum-resin. There occurs, it must be granted, in some specimens of Luban Mati, a very little gum, as I have ascertained since I stated in the 'Pharmacographia' (p. 135) the absence of gum. Water is able to extract from 2·5 to 3·8 per cent. of gum from various specimens of Luban Mati, especially from the inferior kind sent me by Captain Hunter, under the name of "Dookoo," or refuse. But the question arises whether this gum is really to be considered as a constituent of the drug; I doubt that it is so, for gum is occasionally found in form of *single grains* in the remainder of Luban Mati, which has been exhausted by alcohol. This refuse, amounting to about 5 per cent., consists, besides the gum just alluded to, of pieces of the thin papery cork which is so very characteristic of the Boswelliæ, and other fragments of the bark.

As an oleo-resin, Luban Mati is analogous to elemi, but as recently shown in papers of mine and Dr. Buri (see *Pharm. Journ.* 22 Aug. 1874; 19 Aug. 1876), the resin of elemi is constituted partly of crystallizable resins, one of them, which we term elemic acid (*Pharm. Journ.* Feb. 2, 1878, p. 601), being of undoubtedly acid properties. The amorphous resin of elemi is a mixture of a largely predominant indifferent substance and a small amount of an amorphous resinoid acid. But as to Luban Mati, it yields no acid constituent, nor is it capable of affording any crystallizable substance.

The fragrant essential oil of Luban Mati is briefly described in 'Pharmacographia,' (p. 135); the greater portion, boiling at 165°, is to be considered as one of the innumerable modifications of oil of turpentine. That under examination possesses in a high degree the agreeable odour of Luban Mati, reminding of lemons. The resin nearly agrees with the resins of the Coniferæ; I found it to contain on an average, C 79·55, and H 9·58 per cent. This answers to the formula $C_{20}H_{30}O_2$:

20 C	240	79·47
30 H	30	9·93
2 O	32	11·60

To the resin of olibanum Hlasiwetz assigned the formula $C_{20}H_{32}O_4$ (*not* as erroneously printed in the 'Pharmacographia,' p. 124, $C_{40}H_{30}O_6$). It would thus appear that these two resins are not identical; neither of them is probably an individual substance, both being, no doubt, mixed bodies. Many other amorphous resins, like those of coniferæ, of copaiba, elemi, mastich, and sandaraca, correspond with the above formula, or with $C_{20}H_{32}O_3$; all these belong to that class of resins which are unable to yield any aromatic compounds if melted with caustic potash.

Luban Mati is not an article of European trade, but as a chewing material it is quite familiar to eastern dealers and travellers. It is also mentioned —to point out only one instance—in a recent paper on the trade of the Arabs, by Goergens, in the German periodical 'Das Ausland,' 1877, Part. II., p. 668, without any further information.

Captain Hunter informs me, in the written remarks he obligingly sent me in transmitting the specimens of Luban Mati, that in Aden, in July, 1877, the price of Luban, that is common good olibanum, varied from ¾ of a dollar to 1¾ dollars per 28 lbs. (dollars in Aden = 3*s.* 6*d.*) Mati (Luban Mati) fetching from ¾ to 2 dollars for the same quantity. The latter would certainly prove to be well fitted for any purpose for which now common resin, common American frankincense, Burgundy pitch, or galipot and barras (see 'Pharmacographia'), are used. Perhaps larger supplies of Luban Mati will some day reach Europe, if the port of Berbera, now like the whole coast under the dominion of the Khedive, becomes a still more important and regular place than it is at present, for eight months every year, on account of its famous fairs.

As to recent information about Luban Mati alluded to above, there is to be mentioned the account of the German botanist, J. M. Hildebrandt, in the 'Zeitschrift der Gesellschaft für Erdkunde zu Berlin,' 1875 (p. 277). The paper is shortly abstracted in Just's 'Botanischer Jahresbericht,' 1875 (p. 752). Starting from Aden, Hildebrandt paid a visit to the district of the Wer-Singelli, one of the Somali tribes, and the Alh mountains near Cape Chansireh, 45° 41′ E. long. This is a very steep range, as high as 2000 metres, running parallel to the coast, towards which lower hills are gradually descending.

Near the little port or road of Dobbru, not far from Lasgori,* Hildebrandt met with the "Gekar" tree, the Yegaar of other travellers. Its thick low trunk grows out of the nearly perpendicular rocks; the branches were just blossoming the 25th of March. The Somali men and women reach the trees by very dangerous paths, make a large number of incisions in their soft stems, and allow the oleo-resin to flow out. Within the next six days it is collected from the bark, and afterwards each tree is in succession again visited and incised. It would appear that by heavy rains the exudation is sometimes swept away and lost. This kind of olibanum, called *Meithi*, by the people there, is sometimes thrown in the fire by the Somalis, in order to lighten and perfume their huts; they likewise chew it when they are tired. This, however, occurs but exceptionally; most of the commodity is brought down to the sea, and bartered for rice and other food offered there by Arabian merchants. These then sell the Luban Mati in Aden and Gedda (Djedda), whence it finds its way, principally as a masticatory, into the harems. Hildebrandt correctly adds that mastich, used in the same way by the inhabitants of Eastern harems, is a quite different substance.

In that journey to the Somali country, the author had not met with the true olibanum tree (*Boswellia Carterii* probably intended). He says that its exudation requires a fortnight for drying, a statement which appears perfectly intelligible with reference to the large amount of gum present in frankincense. Luban Mati, consisting only of resin and essential oil, will no doubt, much more readily exude and dry on the stems, as above stated. In the Somali country the best kind of olibanum, according to Hildebrandt, is called Nachu, that is pure; in Arabic, and commonly in commerce, it is termed Fusus, tears. The second kind is known under the name of Upis Katjar (middling). Bentley and Trimen, in their 'Medicinal Plants,' Part XX., No. 58, give a good figure of *Boswellia Carterii*, as collected, apparently in another journey, by Hildebrandt, in Somali land.

The position of the places just alluded to may be found in the large map of the Gulf of Aden, as com-

* Ras Gorce, 48° 20′, or another cape, 49° 45′, of exactly the same name (?). Probably the former. Dobbru is not met with in the map before me.

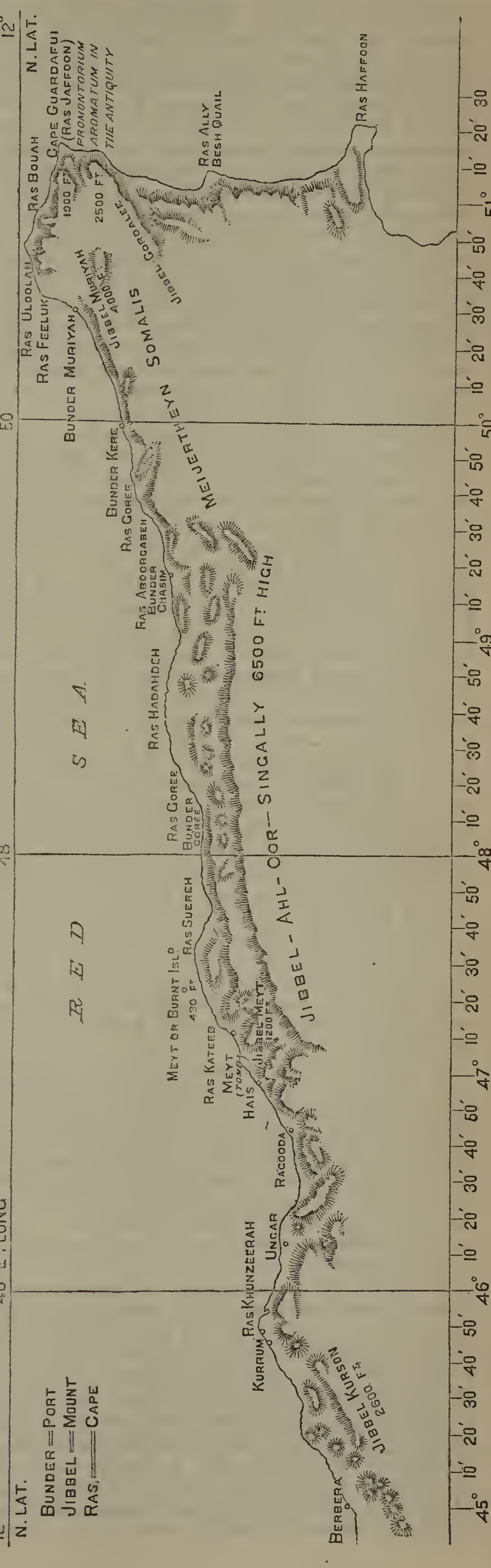
piled in 1874 by James F. Imray, F.R.G.S., chiefly from the surveys made by order of the East India Company. The rough sketch accompanying the present paper is an abstract of that map. The range, Jibbel-Ahl-Oor-Singally there extends from 49° to 47° E. only; Cape Khunzeerah is met with in about 45° 50′ E.

In this map the name of Meyt occurs three times near the western part of the said range: (1) Jibbel (mountain) *Meyt*, in 47° 10′, 1200 feet high, is one of the hills running down to the sea from the high range, which ascends as high as 6500 feet, according to the map; (2) a place *Meyt* is marked on the shore as a "tomb." North-north-east from this, in the open sea, there is (3) a cliff or small island, 430 feet high, called *Meyt* or Burnt Island—perhaps a volcanic formation. To these names, I presume, the appellation of Luban *Mati* or *Meyeti* may possibly bear some relation. In the pamphlet 'Botanische Erläuterungen zu Strabon's Geographie' (Königsberg, 1852, p. 135), Ernest Meyer, the learned author of an excellent history of Botany, also mentions Wellsted's account on Luban Mati (Travels in Arabia, 1833). Meyer then goes on to suggest that it is a superior kind of olibanum, for, says he, mati in Arabic means exquisite. But, as above shown, Luban Mati is not or not much more appreciated by the Somalis or Arabs than Olibanum. And as to the word Mati, it does not appear to belong to the Arabic idiom at all, and at all events, as I learn from eminent Arabic scholars, there is no such expression in the Arabic language meaning exquisite or excellent.

Some further particulars on olibanum are due to the unfortunate Swiss traveller, G. A. Haggenmacher. He had made an exploration in the Somali country shortly before he was killed, in the interior west of the gulf of Tedjura, by the Gallas, towards the end of November, 1875, together with our mutual friend Munzinger Pacha. Haggenmacher has devoted an interesting paper to the Somali country in the supplement, No. 47 of Petermann's 'Geographische Mittheilungen,' 1876, p. 19. In the coast region the more prominent plants are the Mimosæ, Euphorbiæ, Colocynth (Phcogr. 263), and *Calotropis procera* (Phcogr. 380). The hilly region exhibits the richer foliage of Sycomorus and Tamarinds (Phcogr. 197), and a lot of climbing plants growing amidst thorny shrubs. In the high lands of the interior, *Acacia arabica*, Willd. (*A. nilotica*, Desfont., Phcogr. 207) abounds, yet the most interesting plants, in the author's opinion, are the frankincense trees. According to him there are three kinds of it growing in the Somali country, viz.: (1) the tree called *Djau Der*, $\frac{1}{4}$ to $4\frac{1}{2}$ metres high, having a strong straight trunk, the foliage resembling that of the walnut tree, is equally abundant, and much appreciated on account of the dense shadow it affords. The bark is used for tanning, the wood as an incense; its resin constitutes the best kind of olibanum and is exported under the name of Liban Mascati or Liban Maheri. It appears that in summer a round incision is made through the bark into the wood. Towards the end of the rainy season the hole is found to be filled with the precious exudation. Haggenmacher does not state whether the wound or hole is stopped—as it is practised for instance in the collection of larch turpentine ('Pharmacographia,' p. 550).

It is not possible to identify Haggenmacher's tree Djau Der; this name does not occur in any other

Sketch of the Somali Coast.



account as far as I know. Luban Maheri or Mascati, however, no doubt refers to the coast of Arabia between Ras Fartak (52° 10′ E.) and Ras Morbat (54° 34′), where it is exported from the Somali coast. One of the varieties of olibanum, No. 9, sent me by Captain Hunter, is stated by him to be known in the Mahara country under the name of Sheehaz; the tree itself "Magharot." Whether it agrees with *Boswellia Carterii*, Birdwood, as I am inclined to think, must remain unsettled; Sheehaz is an Arabic name applied to that tree. Its exudation, also called Fasous Dhafari by Captain Hunter, is before me and agrees with the best commercial olibanum; he also tells me that Luban Shehri is no longer gathered in Arabia (49° 20′), but that this name is now applied to olibanum coming from the Somali coast. This is to be borne in mind in order to explain how it occurs that olibanum of the Somali coast bears the names of Arabian places.

(2) The *Beyo* tree, says Haggenmacher, is much more abundant than the Djau Der, and yields much more frankincense, which is collected twice a year. Its stem is never straight, but distorted, and only attains the height of a man; the umbelliform branches are bent down and touch the soil. The leaves are similar to those of the Djau Der, but larger. The exudation of this tree is of three kinds, distinguished by the designations of Fesus, being afforded by the first harvest; Naghua is that of the later season, and the impure drug picked out of both is termed Madjendel. Very likely the latter drug is the same which Captain Hunter has sent me under the name of Jandul, that is refuse (No. 11); it is indeed a variety of olibanum, consisting of brownish large fragments and tears, much papery bark (cork) adhering. Another variety (No. 8) is of better appearance and mostly consists of large bright tears; it is called Fasons Sehri in Arabia, and Nakwa on the Somali coast. The tree from which it is derived is known there as Beyo or Mohradd; probably Beyo means the same, and also perhaps Birdwood's *Boswellia Bhau-Dajiana* includes it. The exudation of the Beyo tree, according to Captain Hunter, is exported from the Somali coast, especially from the following small ports: Mait (above mentioned), Bunder Kassim (Ghasim, 49° 15′, in Imray's map), Bunder Khor (nearly 50°), Aloola (Ras Uloolah, 50° 46′).

(3) Muchos is the name of the third olibanum tree affording a resin, which is commonly sold under the name of Fesus, although it is not equal to that. The Muchos tree is nearly as large as the Djau Der; it has small white thorns (?) and a silver white bark.—I have no means of identifying the tree thus alluded to by Haggenmacher; his notice on it plainly shows that he was not a botanist.

The following notice is also in accordance with the above statements.

In an account on the trade of Berbera and the Somali coast, contained in the 'Preussisches Handelsarchiv,' 1875, Part II. 42, four varieties of olibanum are stated to be exported, viz.: (1) Fessous, a dry, pure drug consisting of tears, not chiefly of large fragments, of an intense odour. It is exported from Ongar (Ungar in Imray's map, 46° 16′ E. long.), being paid there 30 dollars (Austrian Maria-Theresa dollars = 32 Annas = 3*s.* 6*d.*) a bahar. One bahar = 14 ferasla; 1 ferasla = 28 robel = 12·73 kilogrammes. (2) Naghua, less pure, 20 dollars a bahar. (3) Wodjendel, very impure, containing much bark, 15 dollars a bahar. (4) Liban Maheri, quite white, a very rare article, fetches 3 dollars a ferasla (that is 42 per bahar). Myrrh is still more costly, being paid from 4 to 6 dollars one ferasla.

In concluding, I may say that the origin and nature of Luban Mati is now satisfactorily settled; there can be no doubt that it is produced by the Yegaar tree, which Dr. Birdwood has described as *Boswellia Frereana*; it appears to be confined to the Somali coast range. Its exudation is entirely different from olibanum by not being constituted of resin, essential oil, and gum, but almost exclusively of the two former. I have ascertained on the other hand, that all the various specimens of olibanum, for which I am obliged to Captain Hunter, the exquisite whitish tears, as well as the refuse, largely contain gum, and not resin and essential oil alone.

As to those species of *Boswellia* which afford olibanum, complete authentic and numerous specimens provided with leaves, flowers, fruits, and the exudation of the stems, collected with exact reference to the plants, are highly desirable, for, in its botanical aspect, the question is still remaining in the same state which I pointed out in the 'Pharmacographia' in common with my lamented friend. In the beginning of similar investigations, Dr. Birdwood had thought the Arabian frankincense trees to be identical with *Boswellia papyrifera*. I was originally of the same opinion until, in 1867, in my 'Lehrbuch der Pharmacognosie,' p. 31, I stated that this was an error, and I accordingly gave the name *Boswellia sacra* to the tree which on the Arabian coast yields olibanum.

Whether this tree is identical or not with that afterwards described by Dr. Birdwood as *Boswellia Carterii*, cannot yet be plainly decided (see 'Pharmacographia'). He was, therefore, not quite correct, when, in 1869 (or 1871) in 'Transactions of the Linnean Society,' XXXI. iii., he stated that I still indentified *Boswellia sacra* with *Boswellia papyrifera*. Nor is there the least reason for attributing any commercial kind of olibanum to *Boswellia papyrifera*, although in the recent French translation of the 'Pharmacographia,' I. p. 268, this is expressly alleged. I know of no authority in favour of this statement, and have even ascertained that the branches of *Boswellia papyrifera*, as contributed in 1867 from the Upper Nile to the Paris Exhibition, were provided with some tears of a resinous exudation, which, however, I found destitute of gum. Richard ('Voyage en Abyssinie,' 1839–1843), as well as Th. von Heuglin ('Reise nach Abessinien,' Jena, 1868, p. 174) were well aware of the abundant oleo-resin of *Boswellia papyrfera*, but without referring commercial olibanum to it.

THE VERATRUM ALKALOIDS.*

BY ALEXANDER TOBIEN.

This interesting essay, of which we can publish only a brief abstract, opens with an historical introduction citing the literature of the chemical investigations made with different species of veratrum. The poisonous properties of veratrum album were known in Spain in the sixteenth century, the rhizome being called *de balestera* or *de jerva*, and it is possible that the *charbak abjadb* of the Arabian

* Beiträge zur Kentniss der Veratrum Alkaloide. Inaugural Dissertation. Dorpat, 1877, 8vo., pp. 38. Translated in *The American Journal of Pharmacy*, March, 1878.

physicians was the same drug. Since veratrum is not indigenous to Greece, the helleboros of the ancient Greeks was most likely not identical with the former.

Pelletier and Caventou examined *V. album* in 1819, and announced the presence of veratria. In 1837, Edward Simon corroborated the presence of veratria, and found another alkaloid which he called *barytin* (from its behaviour to sulphuric acid), changing the name afterwards to *jervia*. H. Will (*Ann. der Phar.*, xxv.) examined jervia, and from his elementary analysis gave it the formula $C_{66}H_{45}N_2O_5$, which was changed by Limpricht *Grundriss d. Org. Chem.*, 1862) to $C_{60}H_{46}N_2O_6$. In 1842 A. Weigand confirmed the presence of veratria and jervia in *V. album*. The same results were arrived at by Herm. Weppen, in 1872, and in the same year Schroff, Jr., announced the presence of veratria in *V. Lobelianum*, while Dragendorff, in 1871, found the second alkaloid (beside jervia) to differ from veratria, and subsequently announced the presence of jervia also in *V. nigrum*.*

The author first examined the rhizomes of *V. Lobelianum*, partly collected from wild plants in Austria, partly from cultivated ones in Russia, in both of which Dragendorff had already found notable quantities of veratroidia. The process adopted was as follows:—

Two kilos of the coarsely powdered rhizome were mixed to a soft mass with sufficient water containing 36·8 grm. phosphoric acid, sp. gr. 1·23, macerated for twenty-four hours, mixed with 7·5 kilos alcohol of 95 per cent., the mixture digested in a water-bath for eight hours, cooled and expressed; and the press cake similarly treated with 12 kilos alcohol of 70 per cent. and 15 grams phosphoric acid. The united liquids were filtered, the alcohol distilled off *in vacuo*, the residue concentrated to a syrupy consistence, mixed with three times its weight of water, the resin filtered off after several hours, and the filtrate rendered alkaline by sodium carbonate. The precipitate was separated from inorganic salts by solution in alcohol, the filtrate diluted with an equal part of water, digested with recently ignited animal charcoal, and the faintly wine-yellow filtrate evaporated, when a yellowish crystalline mass, *a*, was left. The alkaline filtrate from the above precipitate was agitated with chloroform, this solution separated and the chloroform evaporated, leaving an amorphous light-yellowish residue, *b*.

A proved to be jervia, containing some veratroidia, while *b* was a mixture of veratroidia with some jervia. *A* was dissolved in dilute acetic acid, filtered and mixed with dilute sulphuric acid until a distinct turbidity appeared. The yellowish white granular precipitate, collected after several hours, was jervia sulphate not yet quite pure. The filtrate was rendered alkaline by ammonia and agitated with chloroform which left but a slight amorphous pale-yellow residue.

B was contaminated with wax, and contained so little jervia that its solution in acetic acid gave no precipitate with sulphuric acid; through an accident it was lost.

The resin collected as above from the concentrated liquid, after dilution with water, still contained alkaloid. To obtain this, Bullock's method (*Amer. Journ. Phar.*, 1876, p. 147) was tried with indifferent success. The powdered resin now mixed with an equal weight of lime, enough water was added to produce a soft mass, and this dried at 40° C. (104° F.). From the powdered lime resin soap the alkaloid could be extracted with ether, but hot 85 per cent. alcohol was also found serviceable. The alcohol was partly distilled off, then dilute acetic acid added and all alcohol evaporated; the filtrate was treated with sodium carbonate, the precipitate *c* washed, freed from lime by dissolving in alcohol, and this solution evaporated.

The alkaline filtrate from *c* was agitated with chloroform, which, on evaporation, left an amorphous light coloured residue, consisting of veratroidia with a little jervia.

C, consisting of veratroidia with larger quantities of jervia, was dissolved in dilute acetic acid, the solution divided into three parts, which were precipitated respectively with muriatic acid, sp. gr. 1·2, nitric acid, sp. gr. 1·13 and diluted sulphuric acid (1 to 7 water). The filtrates were mixed and marked *d*, the brown-red soft granular precipitates were, after Bullock's recommendation, freed from resin with 95 per cent. alcohol, and the residue dissolved by boiling in strong alcohol, previously diluted with an equal part of water. The filtered solutions left on spontaneous evaporation crystals agreeing with those figured by Bullock and by Wormley (*loc. cit.*).

Pure jervia was obtained from the nitrate by treating it with a warm solution of sodium carbonate, and purifying the alkaloid with strong alcohol, when it formed perfectly white needles, which by ultimate analysis gave results leading to the formula $C_{13}H_{23}NO_4$, or, more closely to $C_{27}H_{47}N_2O_8$ ($O=16$). The sulphate and hydrochlorate have the composition $C_{27}H_{47}N_2O_8$, H_2SO_4 and $C_{27}H_{47}N_2O_8$,HCl.

The acid filtrate, *d*, was precipitated with sodium carbonate, and the precipitate freed from jervia, as recommended by Bullock, by dissolving in acetic acid, and treating with potassium nitrate; the filtrate was rendered alkaline by sodium carbonate and agitated with chloroform; a small quantity of light yellow amorphous veratroidia was obtained, having the following reactions:—

Concentrated sulphuric acid gave a yellow solution, passing through light brown-red into deep raspberry red.

Concentrated muriatic acid yielded a light yellowish rose-red solution, which, on heating, became dirty yellow, and with sulphuric acid and heating brown-red.

Concentrated nitric acid produced a light yellow solution, which, with sulphuric acid and on being heated, turned transiently orange-red and passed into lemon-yellow.

The author observed that small quantities of veratroidia, also of veratria, will materially modify the reaction of jervia, and commercial jervia seems often to contain one or both of these alkaloids. Veratroidia is dissolved by cold concentrated muriatic acid with a pale rose-red colour, which, when heated, is rapidly discoloured. Veratria, on the contrary, dissolves in cold muriatic acid colourless, an intense and lasting red coloration being produced by heat, and this is likewise the case with sabatrina and sabadillia.

Veratroidia is rather freely soluble in water, freely in alcohol, ether and chloroform, little in petroleum spirit (gasolin), somewhat more in benzin and amylic alcohol. It dissolves in water to about the same extent as sabadillia, less than sabatrina, and more freely than veratria; it differs from sabadillia by its greater solubility in ether.

The two alkaloids, jervia and veratroidia, were also found in cultivated old and recent rhizomes, and in the young leaves of *Veratrum Lobelianum*, and in the dried rhizome of *V. album*, which yielded little jervia and more veratrordia.

Jervia is very sparingly soluble in water and in solution of sodium carbonate, freely in alcohol and in chloroform, less in amylic alcohol and benzin, very little in ether, and almost insoluble in petroleum. When pure it is dissolved by concentrated sulphuric acid with a yellow and finally light green colour. Concentrated muriatic and nitric acids cause no change in the colour, but muriate of jervia, thrown into concentrated nitric acid, produced an evanescent rose colour. Potassium nitrate indicates jervia when in dilution of 1 in 1200.

* The literature on the investigation of *V. viride* is given in full. We omit it here, since our readers are familiar with it from the papers of Ch. L. Mitchell ('Proc. Am. Phar. Assoc.,' 1874; *Pharm. Journ.* [3], vol. v., pp. 768, etc.), Chas. Bullock (*Amer. Journ. Phar.*, 1875, p. 449; *Pharm. Journ.* [3], vol. vi., p. 1009) and Professor Wormley (*Ibid.*, 1876, p. 1).

The elementary analyses of veratroidia point to the formula $C_{51}H_{78}N_2O_{16}$ or $C_{24}H_{37}NO_7$. Its action upon frogs is similar to veratria, but much more energetic than either sabadillia or sabatrina.

The composition of the above alkaloids, as ascertained by Weigelin and Tobien, is the following:—

Veratria	$C_{52}H_{86}N_2O_{15}$, W.
Veratroidia	$C_{51}H_{78}N_2N_{16}$,
or	$C_{24}H_{37}NO_7$, T.
Sabatrina	$C_{51}H_{86}N_2O_{17}$, W.
Sabadillia	$C_{41}H_{66}N_2O_{13}$, W.
Jervia	$C_{27}H_{47}N_2O_8$, T.

Even if the molecular value of the formulas should, on further investigation, be altered, this is evidently a natural group of alkaloids, somewhat similar to those of opium and cinchona. The first four show a great similarity in their behaviour to sulphuric acid, but with sugar and sulphuric acid pure veratria yields a green, afterwards blue, coloration, while veratroidia gives a black-brown colour, which lasts for some time.

Veratria, sabatrina, and sabadillia agree in their behaviour to muriatic acid, but veratroidia and jervia differ very widely from it. In their action veratria, veratroidia, and perhaps jervia, are nearest related to each other, but the latter is distinctly characterized by its behaviour to sulphuric, muriatic, and nitric acids.

THE BROMINE PRODUCTION OF THE UNITED STATES.*

BY HENRY S. WELLCOME.

The only available source of bromine supply in the United States is the residual liquor from the salt works, technically known as bittern.

A brief description of the process employed by our leading manufacturers in separating this important element from the salt liquors, may be of interest to you. The original salt liquor or brine is pumped out of the ground at 9° B., evaporated to about 15° in long iron pans; then allowed to settle, and is further evaporated in wooden tanks, heated by steam pipes, to the point of crystallization. The first crystallization yields the best salt of commerce; these tanks, five in number, are placed one above another; each day the liquor is run off from No. 1 to No. 2, next day to No. 3, and so on until it reaches No. 5, the crystallized salt being removed from each tank or so-called grainer, after draining off the liquor. The brine, when it reaches No. 5, is bittern, and consists chiefly of chlorides of calcium, magnesium, sodium, and some aluminum, with varying percentage of bromides of sodium and calcium.

Tank No. 1 is each day filled with fresh brine, and thus the process becomes continuous. The bittern marking 30° to 38° B., is evaporated to about 45° B. By this further evaporation an additional percentage of impure salt is removed, the liquor is then run into stone stills, material for generation of chlorine added, and heat applied by means of steam injected directly into the still, until all the bromine has been eliminated and vaporized, which is conveyed through a condenser into a receiver.

Several recent improvements have been made in the process of bromine manufacture, most of which consist in the form of the bottom of the still, and appliances for condensing the vapour. The most important of these are the devices of F. W. Arvine.

The principal bromine producers in America are: Victor G. Bloede and Co., Parkersburg, W. Va. (have recently disposed of their works); Herman Lemer, Mason City, W. Va.; John J. Jubler, Pomeroy, Ohio; Mason City Salt and Mining Company.

The production of bromine was first commenced in the vicinity of Parkersburg, by Hegeman, a Danish chemist, formerly employed by the Pennsylvania Salt Manufacturing Company.

Mr. Hegeman's operations were of an experimental character at first, and he produced but a limited quantity. As there was at that time very little demand, he realized four dollars to eight dollars per pound for all he made. Mr. Hegeman patented the use of stone stills and steam in the manufacture of bromine and preparations. His claims and patents, as well as the small demand, prevented others from attempting to enter into competition. However, as the use of the bromides became more general, others began to manufacture bromine, their processes varying but little from Hegeman's, though modifications in details have been introduced by each.

Herman Lemer is now supposed to be the largest producer of bromine. He was, formerly, a poor shoemaker at Natrona, Pa., of limited education, but with rare energy, and has developed fine executive ability, which has led him to his present position.

The Ohio and Kanawha salt region yields bittern at least twice richer in bromine than any other yet discovered, and hence holds the balance of power over the whole world.

It is a remarkable fact that the Syracuse and other New York and Western bitterns do not contain any or but a slight trace of bromine.

The quality of bromine produced annually varies greatly, due to the extreme depression and uncertainty of the salt trade, upon which the bromine business is entirely dependent.

The salt interests have suffered much during several years past, as more salt is made than can be sold, and for the last two years it has sold steadily for less than actual cost of production. The uncertainty of the salt furnaces working has induced bromine manufacturers to erect and operate bromine works at every furnace, so that when one shuts down on the production of salt, they may not be wholly thrown out of the production of bromine.

The capacity for producing bromine has risen, during the years 1875 and 1876, to about three times that of 1874 (owing to the facts given above), while the actual production has not materially increased. The capacity at present is estimated by manufacturers at 3000 pounds per day, while the actual production does not exceed 1000 pounds. These figures are intended to convey the average production. There are indications that the production will be lessened for a time, yet that it will be sufficient to supply all demand.

The exportation of bromine has been reduced to a very small matter. The cost and risk of transportation are so great that European makers of bromides cannot compete with the American manufacturers; no steamship company will carry bromine, and it is becoming very difficult to induce vessels to take it at any price.

Recently, owing to the very high prices at which bromides are held in the European market, several lots have been exported, in all about 50,000 pounds this year.

Owing to the great advantage possessed by American manufacturers in the production of the bromides, it is believed that the exportation of bromine will soon entirely cease. The consumption of bromine in the form of the bromides has greatly increased during the past twelve years, the bromide of potassium being the principal salt, but, during the last three or four years, the bromide of sodium, bromide of zinc, and several other bromides are becoming very popular.

The only really new and very recent application of bromine is its use by a Paris firm, within a few months, in the production of a new aniline colour.

I will here express my obligations to Mr. Victor G. Bloede, who has very kindly furnished me the principal points used in this paper, as also to other parties who have furnished me valuable information on the subject.

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* Paper read before the American Pharmaceutical Association. From the 'Transactions.'

NOTES ON INDIAN ROSES AND THEIR PRODUCTS.*

BY J. DOUGLAS, B.A.

In the ancient literature of India the rose is never mentioned, and its names in the modern languages of the country prove that the natives became acquainted with it much later than their neighbours of Persia and Arabia, by whom it was undoubtedly first introduced to their notice. The genus, represented by numerous species, is now generally met with in most parts of the country, and its extension is only restricted by high temperature and a moist atmosphere along with heavy clayey soil. In the Deccan, where they are favoured by a decrease in the tropical heat, roses are very common, and present many new forms in species and varieties. There is no similar increase of forms in the region of the Neilgherry Hills, where the rainfall is very large and the atmosphere excessively moist. In Bengal one of the commonest species is *R. involucrata*, Roxb., which is plentiful in a wild state; other species with numerous varieties are also widely distributed through this province, where they were probably introduced from the north-west. In the mountainous regions of Northern India and Thibet numerous species of the rose are found in a wild state, but, except in Cashmere, they are rarely cultivated either for profit or ornament, as the civilization of the natives of these regions is generally too low to admit a demand for gardens and flowers as such. The highest situation in which roses are found upon the northern side of the Himalayas is in Kumaon, about 13,650 feet above the level of the sea. The average annual winter and summer temperatures in Kumaon are 59°, 47°, and 76° respectively. Roses are very abundant in Thibet, where they present a great variety of forms, and are found at a much greater elevatiou than upon the northern slopes. Ladak and Gnari Khorsum, at heights of 14,625 and 15,112 feet above the level of the sea, are the highest situations in which roses are found in Thibet. The average annual winter and summer temperatures of Gnari Khorsum are 58°, 40°, and 75° respectively. The two species which are found at the greatest height in this region are *R. macrophylla*, Lindl., and *R. Webbiana*, Wall., both of which flourish in Ladak, while the latter extends to Gnari Khorsum. The greatest variety of forms within the species is shown by *R. Webbiana*, which varies markedly not only with the temperature and moisture, but also with the nature of the soil. The most striking differences in the size of the flowers are found in *R. macrophylla*. These differences are directly dependent on the climate, and the greatest dimensions are attained with the greatest degree of warmth and moisture consistent with the existence of the species. In Sikkim, at from 5850 to 7800 feet above the level of the sea, the flowers are more than $3\frac{1}{4}$ inches in diameter; but at their highest limit the surfaces of these roses are scarcely one-tenth as large, and their diameter is little over half an inch.

The production of rose-water and rose-oil is of great importance in India, where the art of preparing them was introduced by the Persians and Arabs. In Cashmere roses are largely cultivated, and the manufacture of their products is a very general branch of industry. They flourish up to an elevation of 5850 feet. In India rose culture is confined chiefly to the districts along the Ganges, and is especially vigorous in the environs of Ghazipore. The greater part of the large quantities of rose-oil consumed in Western and Northern India is imported to Bombay from Persia.

Rose-water is called in India "Gulab," which is the Persian word for rose. Sometines the word "Gulab" means rose alone, and then rose-water is styled "Gulab-pani." "Pani" is a Sanscrit word; but I am not aware of any corresponding Sanscrit term being used for "Gul" or "Gulab." In Pehlevi the rose is called "Rurd," the original meaning of which is "flower" or "flower-leaf." In modern Persian this word has undergone a phonetic change into "Gul," but it is still employed in its original form to designate the rose in Arabic, Armenian, and Hindi. The Western nations became acquainted with the word "Rurd" through the Phœnicians, and from the Arabic "Brovon" it passed into the Greek "Rhodon" and the Latiu "Rosa." The Arabic word "Atr" or "Hatr," meaning "fragrance," is the name of rose-oil in India. The commercial and general used form of the word is "Attur," and it is also found in the forms "Utter," "Odo," and "Otto."

Rose-water is obtained by means of distillation. The rose leaves are placed in clay or metal retorts, with water in the proportion of two to three. The metal retorts generally hold upwards of 100 lb. of water and leaves. The steam passes through bamboo pipes, and condenses in long-necked vessels, which stand in tubs filled with water, which is renewed as often as it gets too warm. About one-third of the vapour is lost, so that 1 lb. of roses is required to produce the same quantity of rose-water. The price of the best rose-water is from 1*s*. 6*d*. to 2*s*. per pound. The sorts usually sold in the bazaars are much cheaper, but are greatly diluted and mixed with various fragrant ingredients. Amongst the cheaper sorts is the liquid which remains after the extraction of the rose-oil. Rose-water is used by the natives of all India as a grateful perfume, and is also one of their commonest medicines. A favourite sweet preserve is also made from the rose leaves, which is called "Gulub-kand," or rose-sugar. The first process in the preparation of the rose-oil is the production of strong rose-water by mixing the results of one distillation with fresh rose leaves and then distilling a second time. The liquid thus obtained is poured into shallow metal basins, which are placed in holes in the ground, previously well saturated with water, and is then left to cool during the night. A thin layer of oil gathers on the surface, and in the morning is skimmed off by means of feathers or thin pieces of wood, and collected in phials. Another method of preparing this oil is to place layers of oiled cotton, or, better still, of oleaginous reeds, such as those of the sesame, between thick layers of rose leaves, and then to bruise the mass in an oil press. The oil prepared in this way contains comparatively little attar, although it generally smells very strongly of it. The quantity of roses required to produce 152 grains of pure attar is estimated at from 10 to 12 lb. In general the dark red varieties of rose are cultivated, *R. indica* and *R. centifolia* being the two favourite sorts. The colour of the oil is not, of course, affected by that of the leaves. When freshly collected it is thick and of a greenish yellow hue, but when it is clear and in a liquid condition it is sparkling and of a very bright yellow. The price of attar is very high, and generally much more variable than that of rose-water; the price of 1 tola, or about 184 grains of oil, has often been known to reach £8 or £9. The maximum is probably that mentioned by Hooker, who, in March, 1858, found the price of rose-oil in Ghazipore to be £10 per tola; the ordinary value of a tola is from £4 to £5, but the cheapest sorts are sold at 30*s*. These sums are not, however, to be understood as prices in the ordinary sense of the term, but rather as estimations of the value of pure oil. The quantity which is sold as quite pure attar is proportionately very small, as it is seldom bought, except as specimens by the wholesale merchants, or by the European inhabitants. The common cheap sorts of rose-oil, which are much used by the natives at their festivals and in their religous ceremonies, are greatly adulterated.

The climate of Ghazipore, which is situate 341 feet above the level of the sea, is subtropical, with intense heat from April to the end of August, the month of May being the warmest in the year. The roses are in bloom from the end of February to about the second week in April. The annual temperature averages 106°. At the end of February the average mid-day temperature is 101°, but at the beginning of April it reaches 108°. Benares is the chief mart for the sale of the rose products of Ghazipore.

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* From the *Gardeners' Chronicle*.

THE PRACTICAL USES OF ELECTRICITY.*

Dr. Siemens, in his recent presidential address to the Society of Telegraph Engineers, made the following remarks on recent practical applications of electricity other than telegraphic :—

Electricity has hitherto rendered service as the swift agency by which our thoughts are flashed to great distances, but it is gradually asserting its rights also as a means of accomplishing results where the exertion of quantitative effects are required. Much has been said about the application of electricity for producing light, and the French Alliance Company, as well as the Gramme Company, have, it is known, for some years been establishing magneto-electric apparatus to illuminate the lighthouses upon the French coast and for galvano-plastic purposes. By an ingenious combination of two magneto-electric machines with Siemens armatures, Mr. Wild, of Manchester, succeeded in greatly augmenting the effects produced by purely mechanical means; but the greatest impulse in this direction was given in 1866-67 by the introduction of the dynamo-electrical principle, which enables us to accumulate the current active in the electric circuit to the utmost extent permissible by the conductive capacity of the wire employed. Dr. Tyndall and Mr. Douglass, chief engineer to the Trinity Board, in reporting lately to the Elder Brethren upon the power of these machines and their applicability to the lighthouses, gave a table showing that a machine weighing not more than 3 cwt. is capable of producing a light equal to 1250-candle power per horse-power expenditure of mechanical energy. Assuming that each horse-power is maintained with an expenditure of 3 lb. of coal per hour (which is an excessive estimate), it would appear that 1 lb. of coal suffices to maintain a light equal to 417½ normal candles for one hour. The same amount of light would be produced by 139 cubic feet of gas of 18-candle power, for the production of which 30 lb. of coal is consumed. Assuming that of this quantity, after heating the retorts, etc., 50 per cent. is returned in the form of gas-coke, there remains a net expenditure of 15 lb. of coal in the case of gas-lighting to produce the effect of 1 lb. of fuel expended in electric lighting, or a ratio of 15 to 1 in favour of the latter. Add to the advantages of cheapness in maintenance, and of a reduced expenditure in favour of the electric light, those of its great superiority in quality and its freedom from the deleterious effects of gas in heating and polluting the atmosphere in which it burns, and it seems not improbable that it will supersede before long its competitor in many of its applications. For lighthouses, for military purposes, and for the illumination of large works and public buildings the electric light has already made steady progress, while for domestic applications the electric candle proposed by Jablikoff, or modifications of the same, are likely to solve the difficulty of moderating and distributing the intense light produced by the ordinary electric lamp. The complete realization of all the advantages of the electric light remains, however, a problem to be solved, and it would be extravagant to expect from applications on a small scale, such have hitherto been made, anything like the amount of relative advantage indicated by theory. The dynamo-electric machine has also been applied with considerable success to metallurgical processes, such as the precipitation of copper in what is termed the wet process of smelting. The effect of one horse-power expended in driving a dynamo-electric machine of suitable construction is to precipitate 21 lb. of copper per 24 hours, equivalent to an expenditure of 72 lb. of coal, taking a consumption of 3 lb. of coal per horse-power per hour. Electrolytic action for the separation of metals need not be confined, however, to aqueous solutions, but will take, perhaps, an equally important development for the separation in a state of fusion of the lighter metals, such as aluminum, calcium, and of some of the rarer metals, such as potassium, sodium, etc., from their compounds. Enough has been shown by Professor Himly, of Kiel, and others, to prove what can be done in this direction, although there remain practical difficulties (chiefly the rapid destruction of the vessels containing the fused masses), the removal of which will require patient perseverance, but they are not likely to prove of an insuperable character. In an inaugural address which I had occasion to deliver to the Iron and Steel Institute a twelvemonth ago, I called attention to another application of the dynamo-electric current, that of conveying mechanical power, especially the power of such natural sources as waterfalls, to distant places, where such power may find useful application. Experiments have since been made with a view to ascertain the per-centage of power that may thus be utilized at a distance, and the results of these experiments are decidedly favourable for such an application of the electrical conductor. A small machine, weighing 3 cwt. and entirely self-contained, was found to exert 2·3 horse-power as measured by a Prony's brake, with an expenditure of five-horse power at the other end of the electric conductor, thus proving that about 40 per cent. of power expended at the distant place may be recovered; the 60 per cent. lost in transmission includes the friction of both the dynamo-electric and electro-motive engines, the resistance of the conductor, and the loss of power sustained in effecting the double conversion. This amount of loss seems considerable, and would be still greater if the conductor through which the power were transmitted were of great length and relatively greater resistance; but, on the other hand, it must be remembered that the power of a natural motor is obtained without expenditure of coal, and that a small caloric motor, which the electric motor is intended to supplant, is inconvenient and very extravagant in fuel. The electric motor presents, moreover, this great advantage, that it requires hardly any installation, and would be available at any time by merely closing the electric circuit without incurring the risk and inconvenience inseparable from steam and gas engines. Without considering at present the utilization of natural forces, let us take the case of simply distributing the power of a steam engine of say 100 horse-power to 20 stations within a circle of a mile diameter, for the production of both light and power. The power of 100 horses can be produced with an expenditure of 250 lb. of coal per hour, if the engine is constructed upon economical principles, or of 250-20=1·25 lb. per station. In the case of the current being utilized for the production of light 2·3+1200=2760, or say, 2000-candle power, are producible at the station, whereas, if power is desired, 2·3 horse-power may be obtained, in both cases with the expenditure of 12·5 lb. of coal, representing 1*d.* per hour for cost of fuel, taken at 15*s.* a ton. The size of the conductor necessary to convey the effect produced at each station need not exceed half-an-inch in external diameter, and its cost of establishment and maintenance would be small as compared with that of gas or water pipes for the conveyance of the same amount of power. Electricity, which in the days of Franklin, Galvani, Volta, and Le Sage was regarded as an ingenious plaything for speculative minds, and did not advance materially from that position in the time of Oersted and Ampère, of Gauss and Weber, and not indeed until the noonday of our immortal Faraday, has, in our own times, grown to be the swift messenger by which our thoughts can be flashed either overland or through the depths of the sea to smaller or greater distances, circumscribed only by terrestrial limits. It is known to be capable of transmitting, not only language expressed in conventional cipher, but facsimile copies of our drawings and handwriting, and at the present day even the sound of our voices, and of resuscitating the same from mechanical records long after the speaker has passed

* From the *Journal of the Society of Arts*, February 1, 1878.

away. In the arts it plays already an important part throughout the creation by Jacobi of the galvano-plastic process, and in further extension of the same principle it is rapidly becoming an important agent in the carrying out of metallurgical processes upon a large scale. It has now appeared as the formidable rival of gas and oil for the production of light, and, unlike those inferior agents, it asserts its higher nature in rivaling solar light for the production of photographic images; and finally it enters the ranks as a rival of the steam engine for the transmission and utilization of mechanical power. Who could doubt, under these circumstances, that there remains an ample field for the exercise of the ingenuity and enterprise of the members of that society I have just had the honour of addressing?

COLLECTION OF CANADA BALSAM.*

In the Report of the Committee on the Drug Market to the American Pharmaceutical Association at its meeting at Toronto, are given the following interesting details respecting the collection of Canada balsam in the Dominion.

This article is largely collected in the province of Quebec, where the *Abies balsamea* grows in great abundance. It is gathered there not only in quantities sufficient to supply the needs of the Dominion, but also to export to a sufficient extent to form an important article of commerce. The writer is indebted to the kindness of Mr. W. E. Brunet, chemist, of Quebec, who is a large dealer in this balsam, for the following details in reference to the collecting of it:—

The whole family of balsam gatherers go into the woods in the Laurentine Mountains, at a distance of from seven to ten miles from the villages. There they encamp for two months, their baggage consisting of canisters, packages of pork, flour, a stove, and bed-covering. The mother remains in the camp to do the cooking and to strain the gum, and it is she who transports it, upon her back, in canisters of 5 gallons each to the village, where she sells it at the rate of one dollar twenty cents a gallon in exchange for flour and pork, which, on her return, she carries also on her back, to the camp. The father, with his boys, goes to pierce the trees, each furnished with a small can with a tube proceeding from it at the top. This tube is of iron, sharpened, and with this portion of the instrument the blisters of gum are pierced, one by one, the liquid flowing down the tube until the vessel is full. The children mount into the branches while the father works about the lower part of the tree. A large balsam tree, rich in gum, will yield as much as a pound of balsam; but one with another the yield of each tree is not usually more than eight ounces. The father, with the help of two children, can gather from sunrise to sunset a gallon of balsam, but the man who works alone has done a good day's work when he has collected half a gallon.

One cannot gather the balsam when it rains, or even on the same day, for the branches let fall drops of water, which, mixing with the gum, render it milky and unsaleable. The collection of the balsam is made from the 15th of June, or about the time that the snow disappears from the mountains, up to the 15th of August or 1st of September, the date when the snow usually begins to fall, or the weather turns cold and the gum no longer flows. Near the villages and upon partially cleared land it is gathered in May, but this is only in small quantities. It is only the poorest inhabitants and the Indians who do this business. There has been gathered in the mountains nearly 3000 gallons this year; the largest crop ever gathered was 5000 gallons. A tree should not be pierced two years running, and requires two or three years' rest before being tapped again, and then it always yields very much less than the first time.

Spirit of Turpentine and *Rosin* were made in Canada during the time of the civil war in the United States, when prices ruled high. They were prepared from the common red pine, *Pinus resinosa*, which grows in abundance in the northern counties of Ontario. The turpentine obtained from this source, although not identical with that made from the *Pinus palustris* and other pines of the South, yet served as a convenient substitute in the various uses to which that article is applied in the arts. At the close of the war, when Southern turpentine resumed its old figures, this manufacture in Canada was abandoned, because it was found impossible to produce it at a price to compete with that from the South.

* From the 'Transactions of the American Pharmaceutical Association.'

THE ROOT OF EPILOBIUM ANGUSTIFOLIUM.*

BY C. J. BIDDLE.

The *Epilobium angustifolium*, L., *E. spicatum*, Lam., is a common plant growing very abundantly in many parts of the United States, north of the 39° of north latitude, and in British America, as far north as Behring's Straits; it is also indigenous to the northern portions of Europe and Asia.

It has a simple erect stem, often branched above, from four to six feet high, leaves scattered, lanceolate, subentire, with a marginal vein, sessile, smooth, acuminate, with pellucid veins; flowers in a long terminal spike, numerous and showy, all parts coloured; petals deep lilac-purple; they appear in July and August. Seeds numerous, in linear four-cornered and four-valved capsules, to which are attached long silky hairs.

The root penetrates the soil quite deep, and is much branched; it is from three to six lines thick, and is covered with quite a thick bark; the ligneous portion is very tough and fibrous.

As to the therapeutic value of the root, as a remedy for the cure of aphthæ, there is no doubt.

It has been used by Dr. H. A. Smith, resident physician of the Philadelphia Hospital, with success.

The form in which it was used was the infusion, made one part of the contused root to sixteen parts of boiling water.

A qualitative analysis of the root was attempted, but owing to the difficulty of securing a large quantity I was unable to treat it as thoroughly as the subject requires.

The dried contused root, when treated with water, either hot or cold, causes small white crystalline masses to separate, which appear under the microscope to be close bundles of needle-shaped crystals; these were separated mechanically, and on testing proved to be a calcium salt.

No preparation of the root when treated with Mayer's test for alkaloids showed evidence that one existed.

A saturated decoction treated with the precipitants mentioned in the 'U. S. Dispensatory,' under Gallæ, page 430, produced very similar results. The root contains large quantities of tannin, gum, and mucilage; it also contains starch, sugar, resin, gallic acid, extractive, etc.

The tannic acid is the kind which produces a bluish-black colour with ferric salts. Its remedial action I do not think is to be attributed to any *one* principle in the root; in my opinion it is in its combined demulcent and astringent properties.

For the cure of aphthæ an infusion of any herb having the above properties is recommended, and as a never failing remedy of easy access we have the "mel sodii boratis" of the Pharmacopœia.

* Paper read before the American Pharmaceutical Association. From the 'Transactions.'

NOTES ON THE OLIVE.

Dear Mr. Editor,—The olive crop has now almost all been gathered in; perhaps a few notes on the cultivation of the tree, and preparation of the oil in this district, may not be without interest.

The produce of the tree forms the staple of the country, and although it is the fruit which absorbs the chief attention of the cultivator, it is not with it the useful products of the tree stops: the leaves have been used in medicine; the wood takes a high polish and is much valued by cabinet makers, and moreover forms the chief, almost the only fuel used by the people; the crushed stones of the fruit when washed and dried also are used for fuel, while the residue left after the extraction of the oil is excellent manure.

The whole country, covered as it is with these trees, possesses a character peculiar to itself. Everywhere the lower hills present the dark dead green colour of the leaves, but seen from an elevated point, when miles of olive groves lay below and the tree tops toss and wave in the wind, the scene can only be compared to the billows as they come rolling in from the sea, as the colour changes from green to grey and then to green again, as first the dark upper side of the leaf, and then the silvery grey of the under is presented to view. Much has been said of the monotonous effect of olives seen in masses, and the want of variety in the landscape, but soon the beauty of the view grows on the visitor, and such complaints die on the lips. The twisted and gnarled trunks would make capital studies for an artist. Nothing can be more beautiful than a vista of olive trees, with their variegated and fantastic shapes, covered as they are with a grey lichen.

On every available spot of ground a tree has been planted; terraces have been built on the hill sides to hold the soil and prevent it being washed away by rains. Every spring each tree is carefully examined and decayed branches cut off, and the earth round is dug so as to give air to the roots. At least once in three or four years the trees are well supplied with manure, the kind most valued for this purpose being the hoofs and horns of cattle, and woollen rags, of the latter those collected from amongst the Neapolitan lazzaroni are most prized, as having peculiar virtue. It will be seen from this that the cost of cultivation, together with the constant repairs needed by the walls of the terraces that support the soil, is no slight tax on the yield, while the expense of gathering the fruit and making the oil is calculated at twenty-five per cent. on the net produce.

From November to the end of March the work of gathering in the olive harvest goes on; the mode followed is to shake the trees and pick up the fruit that falls. This is done from time to time, and towards the end of the season the few drupes that still hang on the branches are gently thrashed off with poles, and very carefully must this operation be conducted, for the young wood formed one year bears fruit the next, so that if the shoots are destroyed by a merciless thrashing in the winter or early spring but little chance is left for a good crop the following season. In some parts the fruit is entirely hand gathered, so careful are the cultivators that the young wood shall not be injured.

Only once in three years is a good crop expected, and bearing in mind that the fruit hangs on the tree from April or May, when it forms, until almost the following March, and as the trees are of very delicate constitution, equally likely to be injured by extremes of climate, heat or cold, long drought, rain or wind, it is not to be wondered that two out of three crops should fail. An enemy is found also in a small insect which lays its eggs in the young fruit, the grub hatched from these feeds on the drupe and prevents it attaining maturity. Those trees occupying the higher grounds are in some degree free from this pest, but are at the same time more exposed to changes of the weather. For this insect plague the people have in a great measure themselves to blame; such is their love of sport that they stalk down every small bird they see, much in the same manner as we at home would stalk a stag in the wilds of Scotland.

The olives when gathered are taken to the mills, where they are first crushed under a stone to a pulpy mass, then placed in bags which, stacked one above another, are subjected to gentle pressure in a screw press; the oil thus obtained is filtered through cotton wool and forms the finest quality. The residue is again ground in a trough through which a constant stream of water is kept running; the stones of the fruit are by this process perfectly cleaned, and fall to the bottom, while the pulp and oil is held in suspension and washed away by the water, which is made to run through a series of cisterns. On the top of the water in each of these a scum rises, which skimmed off and pressed yields a second quality of oil used for lamps and machinery purposes; the residue of this second pressing is boiled with water and the oil as it rises is removed and used eventually by the soap manufacturer. The residue left is most excellent manure; the crushed stones removed in the grinding are sold as fuel. Hanbury, in the 'Pharmacographia,' mentions a report, that in some districts, the mill stones are so mounted as not to break the olive stones, but crush only the pulp. When making inquiries on this point, I was told such was the practice here, the oil yielded by the kernels being supposed by the manufacturers to have a bitter taste, but in the mills I have seen working the stones are broken in the first grinding.

The oil mills here are all worked by water, this scarce but necessary motive power being collected far up in the mountains and carried along the hill sides for great distances in channels or gutters, some foot wide by half that depth; this little stream is made to work the mill by an overshot wheel, is again collected and carried on to another mill lower down, and so performs its work three or four times over before being lost in the sea.

This season's olive crop has been very plentiful, though the drupes are smaller than usual, from the want of rain during the summer; those gathered from the higher grounds are somewhat finer than those grown lower, having been subject to the heavy dews and mists that sometimes cover the mountains in early morning.

I have been informed that the oil made here is of so fine a quality that the whole is exported, and only an inferior quality used for home consumption. How that may be I cannot say, but some twenty thousand quintals of oil are made annually in this district alone, a quantity which considerably exceeds four hundred thousand gallons.

March 20. San Remo.

The Pharmaceutical Journal.

SATURDAY, APRIL 13, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE ROYAL GARDENS AT KEW.

AMONG the institutions of which scientific Englishmen have reason to be proud none can justly lay claim to a higher reputation than the Royal Gardens at Kew. This is the more remarkable because their great reputation is of quite modern growth; for only about five-and-thirty years ago, when they were committed to the charge of the late Sir WILLIAM J. HOOKER, they were comparatively unknown. But, first under the able management of that celebrated botanist and subsequently under that of his no less distinguished son, the collections of plants, both living and dead, have been so perfected that it is scarcely exaggeration to describe them as the cynosure of the botanical world. To the establishment at Kew botanists in every country under the sun are continually making contributions of the rarest gems of the vegetable kingdom, and within its walls visitors from many lands meet to compare its treasures with their own. Moreover, some of the most important and practically useful works on botany published during recent years have been issued under its auspices.

But whilst the gardens at Kew have been growing more and more a household word with scientific men, they have also been steadily growing in favour with the public. The wonders of the palm and orchid houses, and the beauties of the flower beds, have been sufficiently obvious to afford even to non-scientific minds the most exquisite enjoyment, and for several years past this has been made increasingly manifest by the numbers of holiday folk who flock to see the gardens. Unfortunately this has led to temporary unpleasantness, and the very excellence of the service done to the public has virtually contributed to raise discontent in some quarters with those who have rendered it.

The point in dispute is quickly stated. The Directors of the Gardens have hitherto considered it necessary, in order to the furtherance of the objects which the gardens are primarily intended to serve, to keep them closed to the public until one o'clock in the afternoon. Against this practice there is just now a very strong current of public opinion running; meetings have been held, memorials have been presented, and the subject has been brought under the notice of Parliament. Indeed, Mr. GERARD NOEL fairly epitomized what may be presumed to be the official line of defence in a reply to a question put in the House, when he said that the opening of the gardens at an earlier hour could not be conceded without a large increase of expenditure and a material interference with the daily work in the gardens. In fact, it was urged that the change demanded would involve the question whether Kew should continue what it was originally intended to be, a scientific utilitarian institution, or become merely a resort for pleasure seekers. On the other hand, it has been argued that there would be nothing inconsistent with the gardens retaining their scientific character if they were opened at ten in the morning, and instances have been quoted, such as the gardens in Dublin, Edinburgh, and Paris, where the public are admitted at a still earlier hour.

The dispute with the public is hardly suitable for argumentation in these columns, and we would only express a hope that the strongly expressed view of the Director, whose name is so closely associated with the fame of the gardens, may not meet with an unfair antagonism in the shape of clamour about the rights of the people to use the public parks, a right that we presume is not all disputed by Sir JOSEPH HOOKER. But when the plea is put forward that it is necessary that the gardens should be closed during the early part of the day to enable students to pursue their studies unmolested we do feel warranted in asking whether such facilities are afforded to a large number of students as might be expected? For instance, the Royal Botanic Society acts in a most liberal manner towards students wishing to study in its gardens between the hour of opening and 1 o'clock, and the privilege is widely appreciated; but we know of no analogous facilities afforded in the public gardens at Kew. It is true that it has been stated that some such privilege is granted upon proper application, but it is evident from the number of failures that have been recorded that there is at least considerable obscurity as to the form in which the application is to be made.

Again, there is another direction in which we think the services rendered to science by the establishment at Kew might be profitably extended. For the proper illustration of the numerous courses of botanical lectures now delivered in the metropolis and its neighbourhood, in connection with medical and pharmaceutical schools and other institutions, a large supply of typical plants is requisite. For this we believe lecturers in the metropolis are chiefly again indebted to the liberality of the Royal Botanic Society at Regent's Park, and in some measure to the Apothecaries' Garden at Chelsea, but we are not aware of a single instance in which these wants have been supplied from Kew. This may be contrasted with the fact that in one of the suburbs of Berlin there is a garden under the control of the educational authorities from which upwards of four millions of fresh plants are supplied to the schools during the year. In our case no special garden is required, as in the immense grounds at Kew there is room for the cultivation of an ample supply for present requirements.

In conclusion, we need scarcely say that these opinions are not put forth in a cavilling spirit, but because we believe that the arguments of the Kew authorities would have been stronger had they rested on a wider basis.

THE PHARMACEUTICAL SOCIETY OF ST. PETERSBURG.

THE publication in the *Pharmaceutische Zeitschrift für Russland* of the Annual Report of the Pharmaceutical Society of St. Petersburg for 1877, furnishes some details that give interesting indications as to the position of associated pharmacy in the chief city of the Russian empire. But their bearing will perhaps be better understood if we repeat briefly some statistics that have already been quoted in these columns from the same source, to the effect that in 1874 there were in that city 54 free pharmacies and 3 branch establishments, giving employment to 4 magisters, 74 dispensers, 934 assistants, and 77 pupils, or just upon 1100 persons, and dispensing upwards of one million and a half of prescriptions annually.

At the close of 1877, according to the report, the Society consisted of 275 members, of whom only 122 were effective members, 46 were corresponding members, and no less than 107 were honorary members. Of the 122 effective members 65 were not resident in St. Petersburg. During the year, 21 new members had been elected.

In connection with the Society at St. Petersburg there is a Pharmaceutical School, but it does not appear to draw many pupils, only six having presented themselves at the commencement of the course. The report confesses that notwithstanding many attempts to infuse a greater amount of life into the School, these have hitherto been unsuccessful. There can be little doubt, however, that a great part of the unfavourable result last year is due to the fact that the number of practising pharmacists in St. Petersburg has been considerably diminished in order to supply the needs of the war department. The St. Petersburg pharmaceutical students appear also to be suffering under some disadvantage in consequence of obstacles that exist in the way of completing their course of education at the Medico-Chirurgical Academy.

The St. Petersburg Pharmaceutical Society further possesses an analytical laboratory, in which analyses in connection with legal investigations are made for the local authorities, the receipts on this account during the year amounting to 1165 rubles. It has also a library of about 5000 volumes, and a museum. The *Pharmaceutische Zeitung für Russland* is the organ of the Society for the diffusion of pharmaceutical information, and some admirable papers that it contained during the past year had been first read at the Evening Meetings of the Society. At biennial intervals a gold medal, known as the "Suworoff Medal," is awarded by the Society for the best memoir on a subject connected with pharmacy; the subject for the next competition, to be held in 1879, is a "Critical Review of the Methods used in the Separation and Estimation of the Different Cinchona Alkaloids." Finally, the Society has its Benevolent Fund.

The Report also incidentally reveals the effect of the war upon pharmacy in another direction. In Russia the pharmacist is protected to a much greater extent than in this country. For instance, the number of pharmacies is strictly limited, only one being allowed to, we believe, each twelve thousand inhabitants. On the other hand they are placed under considerable restriction, and as in Germany the prices for the articles sold or dispensed in them are fixed by the State. The commercial disturbance caused by the war has led to an enormous rise in the price of drugs, so that in some cases the price allowed to be charged does not cover the cost of the drug. A deputation from the Society therefore waited upon the Medical Council and asked that the tariff might be revised. The suit was, however, not granted, the revision being somewhat ironically deferred until the close of the war.

It is also not without interest to notice, in connection with the position of pharmacists in Russia, that in Russian Poland complaints have been made that the pharmacists do not always possess a sufficient acquaintance with the language of their conquerors. The Council of the Warsaw University has therefore ordered that each pharmaceutical student at the close of each course as well as at the final examination shall be tested as to his knowledge of the Russian language. Lectures in the Russian language are also to be obligatory at this institution in future.

THE DENTAL BILL.

IN looking over the amendments on the notice paper of the House of Commons we observe that Sir JOHN LUBBOCK has given notice of his intention to move the omission of the words "either separately or in conjunction with the practice of medicine or surgery" from the 5th clause.

THE ANNUAL MEETING.

IT is proposed that the Seventh Annual Dinner of the Members and Friends of the Pharmaceutical Society shall take place at the Grosvenor Gallery, New Bond Street, on Tuesday, May 14th, the day preceding the Annual Meeting of the Society. Gentlemen willing to act as Stewards on that occasion are requested to forward their names at once to the Honorary Secretary, Mr. RICHARD BREMRIDGE, 17, Bloomsbury Square.

PROFESSOR BENTLEY'S LECTURE.

WE would remind our readers that on Wednesday evening next, April 17, Professor BENTLEY will deliver a lecture at 17, Bloomsbury Square, on "Eucalyptus globulus and its Uses." The chair will be taken at half-past eight o'clock.

BEQUEST TO THE YORKSHIRE COLLEGE, LEEDS.

THE late Mr. HENRY BROWN, of Bradford, has bequeathed the sum of £5000, free of legacy duty, to the Yorkshire College. It is understood that this is intended for scholarships.

Provincial Transactions.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

A lecture was delivered in the Rooms of the above Association, at No. 4, Halford Street, on the 2nd inst., by J. E. Weatherhead Esq.; subject, "The house I live in."

The President, Mr. Garrett, occupied the chair and briefly introduced the lecturer.

The number of members present was very small, but the visitors, including several ladies, made up a fair audience.

Mr. Weatherhead, before commencing the lecture, presented to the Association a chart of the osseous structure of the lion. The chart was prepared by himself to explain the parts of a skeleton of a lion in the town museum. The lecturer then called attention to the human skeleton suspended against a black cloth, and spoke of the goodness and power of the Creator in producing such a structure, also of the usefulness of this special study to surgeons. Each bone of the skeleton was then fully explained, the bones of the head being illustrated by a skull taken to pieces so that the internal structure could be examined. The skull of a monkey also showed the same arrangement of bones as in the human skull. The teeth were named and described by diagrams, and a very large tooth of a rhinoceros was exhibited. The usefulness of the ulna and radius bones of the arm were shown, without which the hand could not turn as it does. The curved shape of the back bone was shown to be less liable to be strained or broken than if it was straight.

The lecturer, in concluding, illustrated the similarity of the bones of a horse's foreleg with the human arm. He called attention to the common error the public have got into by saying, when a horse has fallen down, that it has broken its knees. The knees he showed to be upon the hind leg close to the stomach, and therefore not liable to injury, the parts commonly called the knees in the horse being truly the wrist bones, the elbow being just under the shoulder, and the bone from the wrist downwards being the metacarpus bones coalesced into one. The toes, or bones corresponding to human fingers, terminate in the hoof.

A vote of thanks was proposed by Mr. Garrett, and seconded by Mr. Shuttlewood, and carried.

Mr. Garrett in announcing the next class, called the attention of the members present to the very small number attending the classes, and hoped to have a great improvement in the future.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

Assistants' Section.

The fifth meeting of the present session was held in the Andersonian College; Mr. Wm. Simpson, President, in the chair.

After the minutes of the previous meeting had been read and confirmed, Mr. C. Macmillan (Vice-President) read a paper on "Food."

He began by pointing out the necessity of food to the animal organism in order to repair the continual waste going on, and showed how the plant absorbed nutriment from the inorganic kingdom to form, with the aid of heat and light, its own tissues, and how it in turn contributed to the formation of animal tissues. He then went on to describe how a certain quantity of food represents not only so much material to repair the waste of the body, but has bound up in it a certain amount of energy, waiting to show itself as heat and mechanical force. After briefly describing the process of digestion, and the various theories regarding assimilation, he divided foods into five classes, viz., nitrogenous or tissue forming, fats, carbohydrates, mineral substances and water, and specified certain staple articles of food in connection with their nutritive value as articles of diet. He made some interesting observations on some of the more important beverages in common use, and concluded by showing how much knowledge concerning the functions of the different kinds of food had increased during recent years, chiefly owing to the investigations of the German school of physiologists, and how much there was yet to learn.

At the close of the paper, the reader was awarded the usual vote of thanks.

The Secretary then intimated that the Council had agreed not to proceed with the formation of a botany class this year, and recommended students to take advantage of the one about to be opened in the Andersonian College, as being perfectly sufficient to furnish all that was required by any one in the botany examination in the Minor. He also intimated that the final meeting of the present session would take place on the 10th April, when the new office bearers would have to be elected.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

The last ordinary evening meeting of the session was held in the Memorial Hall, on Monday the 8th inst., the chair being occupied by the President, Mr. W. S. Brown.

In the absence through illness of Mr. A. N. Palmer, who was to have read a paper, Mr. J. T. Slugg, F.R.A.S., Vice-President, delivered a short lecture on "Glass," treating especially of its application to the construction of optical instruments.

At the close of the lecture Mr. F. B. Benger showed and explained some new and interesting forms of Geissler's tubes.

A cordial vote of thanks to Messrs. Slugg and Benger having been passed, the President announced that owing to his numerous engagements in Manchester he had decided to decline to accept nomination for re-election as a member of the Council of the Pharmaceutical Society, but was glad to say that Mr. G. S. Woolley had consented to become a candidate. Alluding to the state of pharmaceutical affairs in 1870, when Mr. Woolley and himself had been elected members of the Council, and reviewing the subsequent legislation and events, he proposed the following resolution:—"That this meeting considers Mr. G. S. Woolley to be the most suitable person to represent Manchester and the surrounding district on the Council of the Pharmaceutical Society, and pledges itself to use every legitimate means to ensure his election."

Mr. Benger having seconded the resolution,

Mr. J. B. Payne begged to be allowed to support the resolution, as he considered that it was very important that Manchester and the district should be thoroughly represented. He took this opportunity of expressing his regret at the retirement of Mr. Brown, a feeling which he was sure was shared by every member of the Association, as they all knew what valuable assistance Mr. Brown had rendered to the Association. He (Mr. Brown) was a gentleman who had a large experience in committee and council work, and the Manchester Chemists' Association was especially indebted to him for the kind and able manner in which he had supported and assisted it in his capacity as a member of the Pharmaceutical Council. As he had just previously remarked it was essential that so important a district as this should be properly repesented. He supported the resolution, believing that Mr. Woolley, who had always taken a large interest in this Association, as well as in all matters connected with the trade generally, would prove a very able representative.

The resolution was carried unanimously, and the meeting then terminated.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

Thursday April 4th, Dr. Gladstone, President, in the chair. After the announcement of visitors, etc., the minutes of the last ordinary and of the anniversary meeting were read and confirmed. The following certificates were read for the first time: B. Gregory, A. E. Tucker, and T. Slinger. The undermentioned gentlemen were balloted for and declared duly elected: R. H. C. Nevile, R. H. Jude, T. H. Norton, A. K. Huntington, G. H. Rutter, S. S. O. Norris, J. Spencer, T. W. Drinkwater, A. N. Pearson, W. J. Macadam, W. A. H. Naylor, J. Tchermiac, M. Zingler, S. A. Goldschmidt.

Mr. H. C. Sorby, F.R.S., then delivered a lecture—

On the application of the Microscope to some special branches of Chemistry. The lecturer stated that he felt himself placed in a difficult position; if he gave a full account of his subject he feared that every one would be wearied; if on the other hand he contented himself with a summary he was afraid that he would not be understood. He did not propose to touch on the general use of the microscope for magnifying small crystals or examining the minute structure of larger ones, but to confine himself to an application of the microscope to certain branches of chemistry in which it had not hitherto been employed. He would therefore give a rough general sketch of this application and dilate on subjects which were especially interesting to chemists. Lines and circles have long been looked at through doubly refracting media, such as Iceland spar, but until lately no one seems to have systematically studied the appearances which present themselves when appropriate objects are observed with a *microscope* through various crystalline substances. These appearances are quite different because the object-glass of the microscope collects the diverging rays, and we have new conditions. Dr. Royston Pigott described in 1876* his refractometer. The principle made use of in this instrument was the increase of the focal length of the object-glass of a microscope, caused by looking through media of different refracting power. Dr. Royston Pigott measured this displacement by means of a micrometer screw fixed under the stage in such a manner that it became unsuitable for its ordinary use. The author has succeeded in contriving an arrangement which, while it gives sufficient accuracy of measurement, allows the microscope to be used for general purposes. Practically the application of this method is very simple. If an object be placed on the stage of a microscope and the focus adjusted accurately, on placing over the object a plate of some highly refracting substance the object will be invisible, and to bring it into focus the body of the microscope must be moved farther out. If this distance be d and the thickness of the plate be T, Royston Pigott has shown that—

$$\mu, \text{ the index of refraction} = \frac{T}{T - d}$$

Now this distance can be measured either by means of a scale and vernier attached to the body of the microscope or by having the head of the screw which works the fine adjustment graduated. To take an example, suppose we wish to determine the refractive index of water. A short piece of barometer tube is firmly cemented to a glass slide, and the cell thus formed filled with water; the cell is then covered with a cover-glass (which must be larger than the tube, and the surface of the cover-glass must be parallel with that of the glass slide). If the apparent thickness of water t (T-d) = 0·2360 inch, whilst $d = 0{\cdot}0790$ inch, then $\mu = \frac{\cdot 2360 + 0{\cdot}079}{\cdot 2360} = 1{\cdot}335$. A second determination gave 1·334. In order to determine "T" and "d," we proceed as follows:—First to get T, we focus to the upper surface (any dust or scratches will do for focussing) of the glass slide, and read off the position of the body of the microscope, then focus to the under surface of the cover-glass and read off: the difference between these two readings evidently gives us the thickness of the stratum of liquid, *i.e.*, T. Secondly, to obtain "d," the image of a grating or circle is formed under the cell by means of a condenser under the stage, and the microscope focussed to it; the cover-glass cell and slide are now placed on the stage so that the observer looks through the cover-glass and slide but not through the cell; the image is again focussed, the difference between this reading and the first gives the displacement due to the slide and cover-glass. The cell is now pushed over the image and the latter focussed; the difference between this reading and the second gives the displacement due to the stratum of liquid, *i.e.* "d." A two-third's inch objective and No. 2 eyepiece are usually employed. To obtain accurate measurements many precautions are necessary, but with care "T" and "d" can be determined to one-thousandth of an inch. Red light is employed. For small quantities of liquid the ordinary live box is most convenient. The author has determined the refractive index of water with a film one-fiftieth of an inch in thickness, and obtained the number, 1·338. In a similar way the refractive indices of solids can be determined, the only conditions being that suitable slices be cut which are transparent, more or less, and whose surfaces are flat and parallel. If we look at the image of a grating, *i.e.* two systems of lines at right angles to each other through a plate, with flat parallel surfaces, of glass, or any transparent mineral which has no double refraction, both systems of lines are seen at once. The image thus formed is said to be *unifocal* and the index of refraction thus determined is that of an ordinary ray. If, however, the mineral possesses double refraction, the phenomena presented may be totally different; the ordinary ray has the same properties and is strictly unifocal, but the characters of the extraordinary ray differ according as the section is cut perpendicular, oblique, or parallel to the principal axis. Let us take calcite as an example, if we examine the image of the grating through a section parallel to the axis when the extraordinary ray is alone transmitted, the ordinary ray being cut off by a Nicol's prism, it will be found that there are two points separated from one another by an interval somewhat more than one-eighth of the thickness of the section, at each of which only one system of lines can be seen at once; *i. e.*, at one focus, only the lines, say from right to left are visible, at the other only those from top to bottom can be distinguished. The image is thus truly *bifocal.* If we examine a circular hole, furnished by an iris diaphragm, through a unifocal and a bifocal crystal respectively in the first case, the image is seen undistorted and well-defined at one focus, whereas in the bifocal image there is no focal point at which the hole can be seen of its true size and shape; it is either drawn out into a long vertical band with curved ends, or a horizontal band, or forms a large circle without any definition. Crystals like aragonite, which have two optic axes, have no ordinary ray and no permanently unifocal images, but two bifocal images. With such a crystal a circular hole is drawn out into a cross. The lecturer then showed in what direction such crystals must be cut in order to obtain their true indices of refraction. The forms taken by gratings and circles were illustrated by models, and by means of the latter it was demonstrated how it was possible to tell at a glance in what direction a mineral had been cut, in order to furnish the sections under observation. The lecturer then proceeded to explain the application of this method of observation to rock sections, and showed how valuable and simple the process was for identifying minerals—even with sections one five-hundredth of an inch in thickness and one one-hundredth of an inch in diameter good results have been obtained. The sections must be flat and have parallel sides; they can be examined loose or mounted in Canada balsam, the method of observation being very

* 'R. S. Proc.,' xxiv., 393, and *Monthly Micros. Journ.*, xvi., 294.

similar to that described above in the case of liquids. Thus in the meteoric irons of Krasnogarsk and Rittersgrün a clear mineral was proved to be olivine; the three indices were found to be—

Krasnogarsk . . .	1·71	1·68	1·68
Rittersgrün . . .	1·70	1·68	1·66
Olivine . . .	1·70	1·61	1·66

In some cases it is better to compare the index of refraction of the unknown mineral with that of a known mineral, *e. g.*, quartz, which is lying close to it. Even with very black hornblendes good results can be obtained, by using very thin sections, although the mineral is in moderately thin sections quite opaque. As an instance of the marvellously delicate nature of the method, the lecturer gave the examination of a section of a dolerite from near Glasgow one-four hundredth of an inch thick. In this extremely thin section a zeolite, probably analcime, labradorite, calcite, and augite were identified with almost absolute certainty. In a similar way in sections of shells of Pinna $\frac{1}{1000}$th of an inch thick calcite was recognized, whilst in a section of the shell of *Haliotis tuberculata* arragonite was identified. In conclusion the lecturer referred to the connexion between the indices of refraction and chemical composition. The subject is beset with difficulties, principally from defective data, but some points come out clearly; the fluorides have low indices of refraction; all the zeolites have indices less than that of quartz. All the earthy carbonates, sulphates, and borates have indices between those of quartz and corundum. All minerals with an index greater than that of corundum are metallic or metalloidal; sulphur and sulphides have indices above 2·000 and the arsenides above 2·500. A mineral containing calcium instead of the alkalies has a higher index, *e.g.*, adularia 1·52, labradorite 1·61. Again, a mineral containing iron has a higher index than one in which calcium is substituted for that metal: thus in the lime garnet $\mu = 1·74$, in the precious garnet $\mu = 1·79$.

The lecturer finished by stating that much information might be obtained in a very short time by a qualitative examination of a mineral, *e.g.*, whether it was unifocal or bifocal, etc.

The principal appearances described above were illustrated by specimens exhibited.

The President said that he was struck with the great extension of power with which this beautiful research of Mr. Sorby had furnished us. Good results seemed possible with even one drop of liquid.

Mr. Duffy asked if the method had been applied to crystals, raphides, or liquids in vegetable cells.

Mr. Sorby replied in the negative, and pointed out that the cell walls would have to be perfectly flat in order to obtain results.

A hearty and unanimous vote of thanks was then given to Mr. Sorby for his elaborate and important communication, and the Society adjourned to April 18, when the following papers will be read: on Terpin and Terpinol, by Dr. W. A. Tilden; the Poisonous Principal of *Urechites suberecta*, by J. Bowrey; on the Temperature at which a few of the Alkaloids Sublime, as Determined by an Improved Method, by A. Wynter Blyth.

THE SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held at 17, Bloomsbury Square, on Thursday evening, March 28, Mr. J. F. Savory, Vice-President, in the chair.

The first paper read was a "Note on the Various Kinds of Valerian," by Mr. W. R. Atkins. The paper opened with a botanical description of the valerians in general, giving the characters diagnostic of these plants, followed by the various varieties, and the peculiarities of these latter by which they may be distinguished from one another, including the marsh, common, and Pyrenean valerians, the plant known as American valerian belonging to the order orchidaceæ, and bearing no resemblance to the true valerian. *Valeriana officinalis* was, according to the author, extensively produced on the borders of Wiltshire and Dorsetshire. Of the chemical constituents supposed to be contained in valerian root, that known as valerianic acid was most largely treated of. Formerly obtained from the root by distillation, it is now artificially produced by the oxidation of amylic alcohol. The manufacture, tests for purity, and the products of decomposition of this acid were fully detailed. In its dry state the root appears to yield no volatile oil, but after treatment with water does, resemblance being here shown to the production of oil of bitter almonds in presence of water. The paper concluded with details for making the more important valerianates, and the therapeutical action they exert.

A paper by Dr. Senier and Mr. A. J. G. Lowe, on "The Action of Glycerine on Borax," was then read by Dr. Senier.

The Action of Glycerine on Borax.

BY DR. A. SENIER AND MR. A. J. G. LOWE.

Solutions of borax in glycerine are used in medicine, and have to be prepared by the pharmacist—indeed such, a solution finds a place in the British Pharmacopœia. It has sometimes been required to dispense sodium bicarbonate together with borax and glycerine, when effervescence has taken place. This phenomenon has been reported occasionally in the query columns of various journals. The authors of this paper have made a few experiments, which lead at least to a very probable explanation of this reaction, and these they think will be of interest to the Students' Association.

To a solution of borax in water a few drops of tincture of litmus were added, colouring the solution deep blue. The addition of some glycerine to this solution caused it to change from blue to red, the characteristic wine red of free boracic acid. An experiment was then tried using sodium monoborate in place of ordinary borax or biborate; in this case no red colour was developed. The ordinary acid borates of silver, mercuric-mercury, lead, barium and calcium were next employed. In each of these cases the red colour or acidity was developed in the same manner as when borax was employed. Water seems to act in a manner opposed to glycerine, for when added in excess to the acid solution the blue colour returns. It is said that a large excess of water renders even an aqueous solution of borax more alkaline to litmus. It is well known also that solution of sodium carbonate is decomposed by boiling with aqueous solution of borax. In this case carbon dioxide is evolved, and a more basic borate is produced. In like manner sodium bicarbonate or carbonate, or even calcium carbonate is decomposed by solution of borax in glycerine, and there can be little doubt that the reaction is the same; that is to say, that the glycerine separates the biborate into free boracic acid and a more basic borate. This more basic borate is probably not strongly alkaline in glycerine, at least our experiments show that while sodium biborate is acid in glycerine sodium monoborate is alkaline.

We next endeavoured to ascertain the amount of carbon dioxide evolved when carbonate of sodium is added to a solution of borax in glycerine. In these experiments the glycerine, borax, and sodium carbonate all free from notable impurities, were employed in the anhydrous state, it having been ascertained that water lessened the evolution of gas. Solutions of anhydrous salts in anhydrous glycerine are, of course, viscid, and as might be expected little action takes place until the temperature is raised to 100° C. At this temperature part of the carbon dioxide is evolved, but the greater part comes over at a somewhat higher temperature, and in order to ensure complete action the mixture was generally heated at the close to about 180° C. Using concentrated solutions we obtained carbon dioxide in the proportion of one-half an equivalent of carbon dioxide to one equivalent of sodium biborate. Using dilute solutions we obtained rather less carbon dioxide, that is instead of ·044 gram carbon dioxide we obtained ·038 gram. These experiments show that at least in concentrated solutions a sodium borate midway between biborate and monoborate would answer the requirements of the free acid, doubtless boracic, which exists in glyceroles of borax. Very many experiments, not here detailed, were conducted with the view of separating the free acid, either directly or indirectly, all of which gave negative results.

In answer to Mr. Naylor, Dr. Senier described the apparatus used and means employed to estimate the boracic acid liberated.

This was followed by a paper, by Mr. Mason, on "The Flame Tests for Boracic Acid." The author reviewed the flame tests for boracic acid in general use; first, by the use of sulphuric acid and spirit, secondly, by fusing with bisulphate of potash and fluoride of calcium; thirdly, by the use of glycerine; and fourthly, of sulphuric for other acids. All the tests appear to depend upon the liberation of boracic acid, and the author was in favour of the use of glycerine for this purpose.

In the discussion which ensued, however, in answer to a question from the Secretary, Dr. Senier remarked that monoborates will not show the green colour with glycerine, a fact which would limit the applicability of the glycerine test, and which would confirm the opinion previously expressed by Dr. Senier, that the action of glycerine on borax resulted in the liberation of boracic acid and formation of a more basic borate.

In replying to the discussion, Mr. Mason was of opinion that, all things considered, the use of strong sulphuric acid in the blowpipe or Bunsen flame was the best of the flame tests for boracic acid.

Specimens of the leaves, flowers, and fruits of *Eucalyptus globulus*, sent from San Remo by Mr. Hardwicke, a member of the Association, were exhibited by Mr. Parker, accompanied by a description of the plant and the uses to which it was applied.

The meeting was then adjourned till April 25.

LONDON INSTITUTION.

The Analogies of Plant and Animal Life.*

BY FRANCIS DARWIN, M.B.

(*Continued from p.* 781.)

The other tendency, which may be also compared to an instinct, is the power possessed by the growing parts of plants of perceiving the position of the chief source of light. This tendency of course interferes with the geotropic tendency, for if the tip of a growing shoot bends towards the light it deviates from its vertical course. This contest between two instincts is well shown by placing a pot of seedlings close to a lamp or a window, in which case the heliotropic beats the geotropic tendency and the young plants curve strongly to the light; now if the pot is removed to a dark room the geotropic tendency reasserts itself, and the seedlings become once more upright. One might fancy from this that the darkness of night would be always undoing any good gained by heliotropic growth in the day. An imaginary case in the life of a seedling will show that it is not so. A seedling germinates under a pile of sticks: having few competitors it makes a good start, but in consequence of the darkness it begins to starve as soon as it has exhausted the supply of food given it by its mother plant stored up in the seed from which it sprang. It starves because it is dark under the pile of sticks, and without light it cannot decompose the carbonic acid of the air and make starch; carbonic acid may be said to be the raw material from which a plant makes its food—but without the help of light the plant is powerless to make food—it starves in the midst of plenty. So that the power of knowing where the light is and of moving towards it may be just as necessary to prevent a young plant starving as the power of knowing a grain of corn when it sees one and of snapping it up are to a young chicken. Luckily for our imaginary plant a ray of light streams in between two sticks—if the plant insisted on growing straight up in obedience to the geotropic instinct it would lose its chance of life. Fortunately the other light-seeking instinct wins the day and the plant thrusts its summit between the sticks and reaches the light. And now it is clear that when the plant has once got between the sticks the tendency to straighten again in the night will not be able to undo the advantage gained in the day by heliotropism. Besides the tendency to seek the light, there is in some plants another exactly opposite tendency to grow away from it. Just as in the case of geotropism no reason can be given why two organs should be affected in exactly an opposite manner by the same cause; no difference of structure can be perceived and no difference in manner of growth can be found between a tendril which grows away from the light and one which grows towards it. The convenience of the plant seems to dictate the result. Thus the virginian creeper climbs by forming little sticky feet at the end of its tendrils, and as it climbs up a support each new tendril is enabled by its power of seeking for darkness rather than light to find out little dark crannies in which to place its feet. On the other hand a bryony climbs by seizing anything it can get hold of, and as each tendril reaches out towards the light the whole plant will tend to be dragged towards the lighter side of the bush or hedge on which it clambers.

It looks as if the case might be put thus: Given the fact that light produces some kind of movement, the convenience of the plant shall decide whether it be towards the light or away from it; or in other words, grant the plant the power of knowing where the centre of the earth is, and grant it the power of knowing where the light comes from, then the plant itself can decide what course of growth is most advantageous.*

We may find a kind of analogy for these cases of contradictory action—for they really strike one as contradictory.

The chameleon and the frog are both affected in a peculiar manner by light; they both change colour in accordance with variations in the intensity of the light. Moreover, the change of colour is produced by the same mechanism in the two cases; by a kind of contraction and expansion of certain coloured cells in their skin. But the curious fact is that chameleons† become darker in sunshine, while frogs‡ become pale in sunshine and darker in darkness. No doubt both these changes are in some way serviceable to the frog and the chameleon, and we may suppose that the whole phenomenon is really analogous to the opposite effects of light which occur in plants.

To quit the paths of science for those of another region of "Wonderland," it has been pointed out by Mr. Lewis Carrol that dogs wag their tails when they are pleased, whereas cats do so when angry. Seriously the principle is the same—given that emotion produces disturbance of the tail, it will depend on the surrounding circumstances in which the creatures live as to whether a given emotion shall produce a wagging or a rigid tail.

Let us once more consider what needs will arise in the life of an animal, and then see how the same needs are

* A lecture delivered at the London Institution on March 11 by Francis Darwin, M.B. From *Nature*, March 14, 1878.

* I have spoken as if the existence of positive and negative helio- and geotropism could be simply explained by considering the convenience of the plant. But in details many difficulties arise; for instance, some roots are heliotropic. (Sachs' 'Text Book,' p. 755.)

† Brücke, *Wein. Denkschrift*, 1851; v. Bedriaga, 'Die Entstehung der Farben bei den Eidechsen,' 1874.

‡ Lister, Cutaneous Pigmentary System of the Frog. (*Phil. Trans.*, 1858; v. Wittich, Muller's *Archiv*, 1854.)

supplied by plants. An animal needs to be alert to changes going on in the world around it; it needs delicate sense-organs to perceive the approach of enemies or the whereabouts of its food. In fact it is evident that to prosper in the varying conditions of life an animal must be sensitive to these changes. By sensitiveness one means that an animal must be capable of being affected by changes which, considered as mere physical agents, are insignificant. A fly living in the same room with an active-minded boy will depend upon its safety on its rapidly appreciating the approaching shadow of the boy's hand. Now the changes produced in the arrangement of forces in the universe are not perceptibly affected by this shadow—it is utterly insignificant—yet what a violent effect it has on the fly. It is because the nervous system of the fly possesses the property of magnifying external changes so that apparently slight disturbance causes large results.

The power of being strongly affected by apparently slight changes is a very important character of living matter. The processes which occur within the fly have been likened to the explosion of a pistol, the force used in moving the trigger being utterly insignificant when compared with the result produced. I do not mean that this exploding power is a distinguishing mark of living matter, but it certainly is a well marked feature. Besides the power of magnifying or intensifying external changes, which we have described as the exploding power of irritable tissue, there is another, the power possessed by nerves of transmitting a stimulus wave from one part to another. We will first look for this transmitting power as it exists in plants.

The leaf of the sundew, or drosera, consists of a shallow, slightly saucer-shaped disc covered over with short glands, and fringed all round with projecting tantacles which also terminate in glands. The glands secrete a sticky fluid, which hangs in drops on them, hence the name of sundew, because the leaves seem to be covered with dew in sunshine, when other plants are dry. Insects are caught by the sticky secretion, and are also embraced and held fast by the outer tentacles, which possess the power of moving. When the insect has been killed by being drowned in the sticky secretion, it is digested by the acid juice poured out by the glands and subsequently absorbed.

The external or movable tentacles may be made to bend inwards, either by insects alighting on the centre of the disc of the leaf, or on the sticky glands of the tentacles themselves. In the first case, when an insect is caught on the middle of the leaf, and the external tentacles bend in and surround it, we have a true transmission of stimulus, a message sent, like a message is sent along a nerve. The insect may be struggling to free itself, and will probably succeed in doing so, unless the external tentacles give their help. The external tentacles can be made to bend not only by insects or other objects placed on the centre of the leaf, but also by anything placed on the gland at the end of the tentacle itself. In this case the meaning of the movement is equally obvious. If a gnat or fly lights on one of the external glands, it will probably escape, unless carried to the centre of the leaf, where it will be also held by the small sticky glands. Here also there is a true transmission of stimulus. The message has to be sent from the gland at the top to the place where the tentacle bends; a message is sent from the gland to the bending part of the tentacle, just as a message goes through nerve tissue from our skins to our muscles.

In this case the tentacle always carries the fly it has caught to the actual centre of the leaf. But if a fly has been caught by the disc of the leaf, and not quite in the centre, then the messages are sent in accordance with the position of the fly, and all those tentacles within reach move to the point of irritation with marvellous precision. This transmission of messages is all the more wonderful, because, as far as our powers of observation go, there is no special structure to convey the stimulus. It is true that waves of stimulation do travel with special facility along the fibro-vascular bundles, or what are usually called the veins of the leaf. But in this case, where tentacles converge to a given point in the disc of the leaf, this mode of transmission is impossible, because the veins are few in number, and could not cause so nice an adaptation of movements. Moreover, stimuli can travel across a leaf of drosera after the vascular bundles have been cut through.* So that we have the wonderful fact of a wave of stimulation travelling with great accuracy transversely through a number of cells with absolutely no structure like nerve-fibre to guide the course in which the stimulus-wave shall flow.

One other curious phenomenon may be alluded to as showing the extraordinary power of stimulus-transmission. If a piece of meat is placed on an external tentacle, the gland on which it rests sends forth an acid secretion; and if a piece of meat is placed on the centre of the leaf, the tentacles, as before said, bend in and ultimately touch it; but if the external glands are tested with litmus paper before they reach the meat in the centre, they will be found to be covered with acid secretion, proving that not only had a message been sent to the moving part of the tentacles, but also to the secreting cells in the gland.

One might find a parallel to this in the action of the human salivary glands. The gland nerves may be excited either by the stimulus of food placed in the mouth, or by the voluntary action of the muscles of mastication. Here the saliva is poured out, although there is no food to act on, just as the drosera-gland secretes during the movement of the tentacle before there is anything for its secretion to digest.

Having briefly considered the transmission of stimulus-waves as shown in drosera I will pass on to consider what manifestation may be found of the other general property of nerve tissue, the property which I have called exploding power. It is chiefly manifested in drosera by the extreme sensitiveness of the glands on the external tentacles. It is found not to be necessary to place meat or insects on the glands, but that bits of glass, wood, paper, or anything will excite them. Smaller and smaller atoms were tried and still the glands were found to be sensitive to their presence.† At last a minute piece of a human hair, about one-hundredth of an inch in length, and weighing just over $\frac{1}{80000}$ of a grain, was placed on the gland of a tentacle and it caused unmistakable movement. The case is yet more wonderful than it sounds, because the piece of hair must be partly supported by the thick drop of secretion on the gland, so that it is probably no exaggeration to say that the gland can perceive a weight of one-millionth of a grain. This degree of sensitiveness is truly astonishing, it seems to us more like the sense of smell than that of touch, for to our most delicate tactile organ, the tongue, such atoms are quite imperceptible.

The power which drosera has of perceiving the presence of ammonia is perhaps still more astonishing. A solution of phosphate of ammonia in pure distilled water in the proportion of one part to over two million of water, caused inflection of tentacles.‡ One may form an idea of this result by making a solution of a single grain of the phosphate and thirty gallons of distilled water, and then finding out that it is not pure water. Considering the water-supply which we at present enjoy, we may well be grateful that our senses are duller than those of a sundew.

As examples of simple sensitiveness these facts are sufficiently striking, but the powers of discriminating between different kinds of stimuli are equally curious. The tentacles having proved so extraordinarily sensitive to light bodies resting on them, one would expect that the slightest touch would make them bend. But it is not

* See Batalin, 'Flora,' 1877, who has correctly pointed out the importance of the fibro-vascular bundles as conveying stimulus-waves.

† 'Insectivorous Plants,' p. 32.

‡ 'Insectivorous Plants,' p. 170.

so; a single rapid touch, though it may be violent enough to bend the whole tentacle, does not cause inflection. The meaning of this is clear, for in windy weather the glands must be often touched by waving blades of grass, and it would be a useless labour to the plant if it had to bend and unbend its tentacles every time it was touched. It is not excited except by prolonged pressures or quickly repeated touches. This is also quite intelligible, for when an insect is caught on the sticky secretion of the gland it will give a somewhat prolonged pressure, or a number of kicks to the sensitive gland, unless indeed it flies away after a single struggle, and in that case the tentacle will be also saved from uselessly bending.

In another carnivorous plant, dionæa, the specialization of sensitiveness is exactly the reverse; thick and comparatively heavy bits of hair can be cautiously placed on the sensitive organs without causing any movement, but the delicate blow received from a cotton thread swinging against the hair causes the leaf to close.* Dionæa catches its prey by snapping on it like a rat-trap—there is no sticky secretion to retain the insect as in drosera till the slowly closing tentacles can close on it. Its only chance of catching an insect is to close instantly on the slightest touch. The specialization of sensitiveness in dionæa is therefore just what it requires to perfect its method of capture.

In describing the sensitiveness of drosera and dionæa I wish rather to insist on a wide and general similarity to the action of nerves. There may be said to be an analogy between the specialization of extreme sensitiveness in drosera and dionæa and the nervous tissues of animals, because these properties play the same part in the economy of the plant that is supplied through some kind of nerve machinery in the higher animals. Closer analogies could be pointed out. There are, for instance, the well-known researches of Dr. Burdon Sanderson, in which he compares the electrical disturbances which occur in the leaf of dionæa to those which take place in nerve and muscle. Again Mr. Romanes has, in a recent lecture in this place, compared the peculiar sensitiveness of drosera to repeated touches with the phenomenon known in animal physiology as the summation of stimuli. But I have merely sought to show that we find in drosera a power of conduction of stimuli, an extreme sensitiveness to minute disturbances, and a power of discriminating between different kinds of stimuli which we are accustomed to associate with nervous action. To establish this analogy I believe that the examples already mentioned may suffice.

(*To be continued.*)

* 'Insectivorous Plants,' p. 289.

Parliamentary and Law Proceedings.

Sweet Spirit of Nitre at a Cooperative Store.

At the Huddersfield County Police Court, John Balmforth, manager of the Equitable Cooperative Store at Marsden, has been fined 10*s.* and the expenses for having on the 8th inst. sold to Mr. Superintendent Sykes four ounces of sweet spirits of nitre which on analysis by Mr. Allen, of Sheffield, analyst to the West Riding, was found to be 43·2 degrees over proof, whereas it should have been 52·4 degrees over proof.

Poisoning by Cyanide of Potassium.

On Wednesday April 10, Mr. W. Carter held an inquiry at the Duke of Clarence Tavern, Penton Street, Newington, as to the death of Mr. Stephen Stammers Austin, 47, who resided in apartments at Lambeth. On Saturday afternoon last, Mr. Austin entered the Queen's Head Tavern, Lock Square. After a short time he picked up a bottle from the corner near the fire place and drank a portion of its contents. He then said to a Mr Hughes, "I have drank some cyanide of potassium." He appeared to be sober and collected. He was afterwards attacked with a fit of trembling, and taking a document from his pocket he asked a man named Ross to hand the paper over to Mr. Cowley, the landlord. Mr. Austin then fell down and died. Mr. Carter read the following document written by the deceased, dated April 8:—"I die from the effects of partaking of cyanide of potassium, prussic acid. I take it through necessity, as I have been suffering from neuralgia of the brain. There is no necessity of making a *post-mortem* examination." The jury returned a verdict of "Temporary insanity."

Dispensing Memoranda.

[80]. Boracic Acid Ointment (Lister's).—The suggestion in the "Month" in regard to this to dissolve one ounce of "boracic acid in a little water" (three ounces of boiling or twenty-five ounces of cold water would be required) "in a test tube," add to five ounces of melted fatty basis "and stir constantly till cold," is impracticable. The formula is quite correct unless specially ordered by Professor Lister to be made with half the quantity of boracic acid. It is applied more like a plaster than an ointment as a dressing to burns, etc. The use of spirit as suggested by one of your correspondents is inadmissible. Let "Quærens" try labour and let him *warm* his powdered boracic acid before adding to it the melted fats. Wm. Martindale.

[92]. T. F. E. will find on referring to the B. P. that there is only one preparation designated "Magnesia;" the other identical in composition but differing physically is described as Magnesia Levis. The former of course would be the correct one to use in dispensing the above prescription, and neither Magnes. Carb., Magnes. Carb. Levis, nor Magnes. Levis could be substituted with propriety. E. Mann, *Halifax*.

[93]. H. G. C. thinks the mixture will answer if the ext. cinch. liq. be first shaken with a little mucil. acaciæ and the water, and the potass. iod. be then added. He has found this plan answer well in mixtures containing tr. cannab. indic. and tinct. tolut.

[94]. A good excipient is a mixture of one part of powdered soap and five parts of powdered liquorice root. Three grains of this will take up one grain of carbolic acid or one minim of creasote, or of any essential oil, without any other addition, making a firm pliable mass, easily rolled. Moule.

[95]. It is quite evident that "Tr. Sap. Virid. Co." (New York prescription), as given by "G." in the "Memoranda" of April 6, is either some proprietary article or, what is more likely, the Tr. Verat. Virid. is the preparation meant. Some men are so careless in writing, and some so ignorant of the Pharmacopœia and its preparations, that many do not know the difference between a compound and a simple tincture. This will account for the very stupid prescriptions so constantly written. The prescription (95), besides the Tinct., contains Hydrarg. Bichlor. and Aq. It is evidently for some skin affection, such as acne, and the Tr. Verat. Virid. is used as a discutient and anodyne preparation externally, as well as in various diseases internally; but with its internal use we have nothing to do at present. Sap-green, the juice (succus) of buckthorn evaporated with lime so as to form a solid, cannot be meant, and I never heard of a tincture of green soap. I therefore think the compounder would be justified in using Tr. Verat. Virid.

The U. S. formula is stronger than that usually made in England. I know of no tincture prepared from any of the sapotaceæ or sapodilla order of plants that could be meant. The seeds of *Achras sapota* are aperient and the bark used as a febrifuge. *Bassiă butyracea* furnishes a kind of oil or butter; *Chrysophyllum* supplies fruit for dessert. *Isonanara gutta* is the gutta percha tree in Singapore; and the kernels of *Lacuma mammosa* abound in hydrocyanic acid, etc.—H. BROWN.

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[95]. In reply to G., I beg to say that Tr. Sap. Virid. Co. is a solution of green soap in spirit of wine (one of soap in two of spirit), scented with oil of lavender (ʒij in Oj). As green soap is seldom to be procured in this country I use freshly prepared soft soap, B.P. The form as given by G. I have often prepared for some kind of ringworm and scabies. C. J.

Bury St. Edmunds.

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[96]. A. S. R. asks for the formula of Ol. Hydrarg. et Morph. I may state it is prepared of various strengths after the formulæ of Mr. John Marshall, F.R.C.S., and was prominently brought before the notice of the medical profession in a lecture delivered by Mr. Marshall on the 16th of March, 1872, and reported in the *Lancet* of the 25th of May following.

In the said lecture a full history is given, but, perhaps, A. S. R. may not have easy reference to the above-named source. Mercury is dissolved in nitric acid, and caustic potash or soda added, and the yellow impalpable oxide well dried. It is found that the precipitated oxide readily dissolves in oleic acid at a temperature of 300° F. A 5 per cent. solution is clear and fluid as olive oil, a 10 per cent. is as clear but dark as linseed oil, and a 20 per cent. unctuous, and not unlike resin ointment. To each drachm one grain of the muriate, acetate, or meconate of morphia is added, and constitutes the Ol. Hydrarg. et Morph. It will be observed the 10 per cent. applies to the oxide of mercury, not to the morphia. The oleate is applied instead of the old Ungt. Hydrarg. by means of a brush to inflamed joints, etc., or the stronger preparations are smeared over the affected parts by the finger. Strong preparations require caution.

Northallerton. HENRY BROWN, L.R.C.P., etc.

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[96]. OLEATE OF MERCURY.—The following formula for oleate of mercury, first introduced by J. Marshall, F.R.S., and manufactured by Messrs. Hopkin and Williams, is from the University College Pharmacopœia. To each drachm of it add one grain of morphia (pure alkaloid) for Ol. Hydrarg. et Morph. (10 per cent.):—

15. *Linimentum Hydrargyri Oleatis* (10 *per cent.*).
Precipitated Peroxide of Mercury . 1 drachm.
Oleic Acid . . . . 10 drachms.

To the oleic acid, kept agitated in a mortar, sprinkle in the peroxide gradually, and triturate the mixture frequently during twenty-four hours until the peroxide is dissolved and a viscid solution is formed.

WM. MARTINDALE.

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[97]. This is another instance of stupidity in writing a prescription. Sol. Taraxaci is evidently Liquor Taraxaci, a preparation at one time largely used. Some wholesale houses send out a very elegant Liquor Taraxaci.

HENRY BROWN.

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[98]. Would some reader kindly inform me how to dispense the following prescription?—

℞ Liniment. Opii post Bowes . . ℥iss.
M. Sig. For external use.

EDINBURGH.

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[99]. TINCT. QUINÆ.—Can you inform me through the medium of the Journal why tinct. quinæ, B.P., after being made and bottled some time, forms a feathery-looking sediment round the bottom and neck of the bottle?

R. S. T.

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[100]. CREASOTE PILLS.—Can any one inform me as to the best method of dispensing a prescription, of which the following is a copy?—

℞ Creasoti . . . . gtt j.
Panis . . . . q.s.
Mucilag. Acaciæ . . . . . . gtt j.
Ft. pil. mitte xij, silvered.

The bread on coming in contact with the creasote immediately becomes dry and crumbles.

R. S. T.

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[101]. AQUA MENTHÆ.—When aqua menthæ is ordered in a prescription should aq. menth. pip., or aq. menth. virid. be used?

DUBIUS.

Notes and Queries.

[579]. MIST. FERRI COMP. CONC.—Just make the Griffith's Mixture (Mist. Ferri. Co., B.P.) eight times stronger, omitting the ferrous salt. If made with the "fat gum" the solution is somewhat milky. But an inferior quality gives a reddish-coloured fluid more clear than the above. Probably the addition of spirit caused the increased transparency of one of the samples.

J. B. L. M.

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[581]. IRISH SLATE.—The question of your correspondent, W. L., in the Journal of March 30, is not replied to in the statements of F. P. and J. F. R. in the Journal of April 6. I have noticed the description in Gray's 'Supplement' referred to, but my answer would be, "Irish Slate!" I should give what is asked for. Having about two cwt. of the article in stock, I shall be happy to send W. L. some if he will apply to

W. T. MARTIN.

16 *and* 17, *Cliffe, Lewes.*

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[582]. GINGERADE.—Use Essence of Ginger deprived of its resin. Such a preparation by several makers is now before the public. That manufactured by Mr. Hay of Hull, advertised in Journal, No. 405, I have seen. It is very good and has been well recommended.

J. B. L. M.

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[583]. CELLAR LABELS.—In my experience sized writing paper, coated (after inscription) with solution of orange shellac, has most effectively resisted damp.

J. B. L. MACKAY.

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[584]. PREPARED SILICA can be obtained from the principal wholesale houses or from the importers, Read and Co., Cope Street, Coventry.

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[586]. ESSENCE OF GINGER.—Will any one oblige with a recipe for making a strong Essence of Ginger, to be miscible with water without being opaque?

ASSOCIATE.

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[587]. COD LIVER OIL EMULSION.—May I ask through the medium of the *Pharmaceutical Journal* for any good recipe for Cod Liver Oil Emulsion that will not separate?

H. T. B.

Correspondence.

**** No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Patent Medicines.

Sir,—Permit me to offer a few remarks in reply to the letter of A. G. in the Journal of last week. He admits the truth of what I said in my letter of the 30th March, and that the "Chemists have a grievance in that as well as many other respects, which he says can only be remedied by an Act of Parliament." I quite agree with this, but to the insinuation, that "I with many others think a chemist is to be found in every village," I have only to say that I never for a moment entertained such a thought; nor do I think any chemist in his right senses would.

As to the seventy large villages and hamlets which A. G. says exist in his neighbourhood, I do not doubt but that the eight registered chemists there will be fully competent and able to supply all patent and other medicines without the interference of any unqualified person.

I would not suggest a chemist for every village, as it would neither be sufficiently remunerative, nor necessary, and I would inform A. G. that it is not only the country chemists who are obliged to deal in a "most heterogeneous and sundry kind of goods as well as drugs" to make a living, but many of his town brothers also; a state of things to be deplored, and for which it is difficult to find a remedy. But I believe if we were to get our full and legitimate trade (which at the present time we do not) many would confine themselves purely to dispensing and the sale of drugs. I myself have a strong objection to selling groceries, hardware, and other things foreign to our calling.

The purport of my letter was simply to advocate the sale of patent medicines by qualified and registered persons only, and in doing that I think I am not only considering the rights of the chemists, but the wellbeing and safety of the public.

What I am most grieved at, is the low prices for which patent medicines may be obtained; in fact it is extremely unpleasant to be told by customers that they can save threepence by getting a box of Holloway's pills at so and so's the draper; and it is only a week ago that a lady told me that she had got two 2*s.* 9*d.* bottles of Eno's fruit salt at my shop, but that a friend had got another bottle for her at 2*s.* 4*d.* elsewhere. Now, sir, I ask if this is not interfering with our interests, what is? Surely the chemists might agitate, get an Act passed, or do something to put an end to this sort of things, which if allowed to go on, must certainly lead to very serious results, as far as the pockets of chemists are concerned.

Tento.

Sir,—I have been astonished by the reasoning and conclusions of your correspondent A. G., who, after remarking that in his neighbourhood in one direction there are seventy large villages, besides numerous hamlets, wherein there are only eight registered chemists; and in another direction forty villages with but two registered chemists; goes on to say that because of competition and the difficulty of making a living in those large villages, the registered chemist must needs retire from the field of competition and allow his friends (also registered), who style themselves wholesale druggists, to amend the Pharmacy Act and register the most ambitious man in every village, not only for the sale of patent medicines, but poisons as well, and thereby legislate not for the educated pharmacist, but for some one or other whom he is unfortunate enough to come into collision with in his legitimate calling as a chemist and druggist. Now, I do know this much about the matter, that if our brethren on the register were true to one another, and that if it were not the fact that in all those villages in question the carts of small wholesale druggists are to be seen delivering their goods, including poisons, during several days of every week; and that if they did not compete so eagerly with one another by sending their young men into every one of those places for orders, life would soon become to the chemist more of a pleasure, and we would hear less of those distressing appeals to the

Manchester. Benevolent.

Sir,—I am glad to find that the "patent medicine question" is beginning to be fairly discussed. It is a matter of the greatest importance to the majority of chemists, and I consider it is the duty of all chemists to use their influence to gain by Act of Parliament the sole right of vending patent and all other medicines. If necessary let the cost of licence be increased or even doubled. It may be urged that inconvenience would be caused to the public by their not being able to get pills, castor oil, etc., in country villages. I do not consider this would be the case as in emergency a surgeon would be called in and as a rule simple medicines would be kept at hand, and very few places are without railway communication or carriers once or more a week to the market town. To show the necessity of legislation on this question, I enclose a list of patent and other medicines sold by an advertising "tailor" in Liverpool at prices which would prove a bait that many would greedily swallow. I trust our representatives on the Council of the Pharmaceutical Society will bring this matter under discussion and endeavour to stop this evil and injustice.

Lancaster, April 4, 1878. Treu und Fest.

To the Benevolent.

Sir,—In addition to the sum of £10 16*s.* which you kindly announced in last week's Journal that I had received on behalf of Mrs. Dixon and her family, I have since received the following contributions:—

	£	s.	d.		£	s.	d.
Frederick Barron	3	3	0	P. C.	0	5	0
John Attfield, Ph.D	2	2	0	W. H. Rogers, J. P.	0	5	0
George Dowman	1	1	0	J. S. B.	0	2	6
Thomas Summers	1	1	0	J. D.	0	2	6
W. Patterson	1	1	0	J. Pearce	0	2	6
Thos. Juves	1	0	0	B.	0	2	0
Miss White	1	0	0	L. C. "domestic servant"	0	1	6
William Barron	0	10	6	"Sundries"	0	2	0
G. B.	0	10	0	J. Adams	0	1	0
H. Abraham	0	5	0				
"Charity"	0	5	0				

I desire to express my best thanks to all the kind donors.

Robert Chipperfield.

Southampton, April 9, 1878.

H. G. C.—Messrs. Hopkin and Williams, Cross Street, Hatton Garden.

A.P.S—The paper on Physic Mass will be found on p. 481 of the present volume. We do not think the time has yet arrived for republication of the formula.

W. R. Fowler.—The Act makes it penal to wilfully and unlawfully administer or cause to be administered to horses, cattle or domestic animals "any poisonous or injurious drug or substance," but it does not contain a poison schedule or any definition of what is to be deemed a "poisonous or injurious drug or substance."

G. C.—St. Ignatius' Bean is official in the United States Pharmacopœia. Its physiological action is described as being very similar to that of nux vomica seeds, but more energetic. The dose of the powdered seed, according to the American Dispensatory, is one or two grains.

"*A Swedenborgian.*"—The bearings of the subject are too purely medical to allow of its discussion in this Journal.

A. G. R.—The Paris Society's formula for Syrup of Bromide of Potassium is printed on p. 68 of the present volume.

W. Wing.—The specimen appears to be a variety of lancifolia bark.

H. L.—A formula for an emulsion of cod liver oil and the hypophosphites will be found in vol. v., p. 770 of the present series of this Journal.

H.—The letters F.C.S. can be used only by members of the Chemical Society.

Communications, Letters, etc., have been received from Mr. Howard, Mr. Cathcart, Mr. Wright, Mr. Rayner, Mr. Kitchen, Mr. Barnes, Mr. Blaikie, Mr. Buck, Mr. R. F. Smith Alpha, Nepos, H. G. C., R. S. P., H. M. H., S. W.

THE FAST GROWING VARIETY OF CINCHONA CALLED PUBESCENS.

BY J. E. HOWARD, F.R.S.

I send a few facts to complete (thus far) the history of the above promising sort, to which Dr. de Vrij has very properly called attention in your columns; and respecting which I had much correspondence with the late Mr. McIvor.

It is about ten years since this skilful cultivator raised from seed two sorts of *officinalis*, which for some reason he considered to be hybrid with *C. succirubra.* The two were alike distinguished by strong and vigorous habit of growth, and at a little distance it was difficult to discriminate between them. As they developed, however, it was found that the one with slightly pubescent leaves yielded much more quinine in the bark than the other. I suggested, for distinction's sake, calling this the *var. pubescens*, which has unfortunately since become changed into *C. pubescens*, How., an entirely erroneous designation.

Referring to the bark sent both to Dr. de Vrij and to myself in 1873, Mr. McIvor says, "This bark is taken from a hairy leaved variety of *C. officinalis.* It is a tree of wonderful growth. It produces enormously thick bark, and the tree is not injured by wind. The tree from which I now send you the bark is only five years old. It is twenty-six feet high and has a stem of sixteen inches in circumference at the ground, and the bark now sent you is taken in a strip from the stem to the height of about twelve feet from the ground. This tree grows at least twice as fast as *C. succirubra.* The bark of this variety which I sent to Dr. de Vrij was taken from a tree grown at a high elevation and with a N. W. exposure. The bark now sent you is taken from a tree growing at a low elevation with a N. E. exposure. Dr. de Vrij found the bark of this species to yield 10·67 per cent. of total alkaloids with 4·72 of crystallized sulphate of quinine. If under all conditions this bark is found to yield this amount of alkaloids, and especially quinine, it is certainly the best plant we can grow; being hardy and of rapid growth and perfectly free from canker and other diseases to which the *officinalis* and especially the *calisaya* are liable. I therefore sincerely hope that you will be able to confirm Dr. de Vrij's results, and if this occurs in the two barks taken from different positions of elevation it will establish the value of the species beyond doubt."

The examination which I made quite confirmed and even surpassed the results obtained by Dr. de Vrij, as the notes I have preserved indicate a produce equal to 6·00 sulphate of quinine, 5·00 sulphate of cinchonidine, cinchonine and amorphous alkaloid 1·20 per cent. Even this was exceeded after an additional year's growth. In June 1874, Mr. M. writes, "I take the liberty of again sending you some bark of *C. pubescens.* This sample is of the narrow strips left on the same tree from which I took the bark sent to you in December last. If not giving you too much trouble I would very much like to know what this bark yields, the more so [as some persons] have been trying to impress on the Government here that mossing does not improve the bark on the tree generally and that the renewing bark draws the alkaloids from the natural bark adjoining, *i. e.* that the alkaloids in the natural bark are transferred to the renewing bark. I do not believe this to be the case, but if it is so in any degree the bark now sent you will show exactly to what extent this takes place; as the narrow strips of bark were surrounded on all sides by renewing bark."

The examination of the above "strips" was therefore of special interest in connection with an important problem in vegetable physiology. They gave equal to—

	Per cent
Sulphate of Quinine	6·94
" Cinchonidine	4·48
" Cinchonine	0·20
" Quinidine	0·14
Amorphous alkaloid	1·14
	12·90

Thus disproving the transferrence theory.

It will be noticed that my friend de Vrij has recently obtained more quinine and less cinchonidine than I have done. This is no doubt owing to his having described the results of examination of renewed bark. I have also a small specimen of this, but have not subjected it to examination.

It is obvious that a plantation of this kind is likely to be very profitable. Mr. McIvor wrote me in August, 1875, that 20 acres had been planted in the previous year, and that in the year above named they had planted out 60 acres on the Kartairy estate. The next year occurred his lamented decease, and I am unable to continue my record in consequence.

The great question is, how far is it possible to count upon the propagation of this sort. Mr. McIvor speaks with a varied amount of certainty. In the last letter I had from him he says, "You are quite correct as to the danger of relying on plants raised from seeds of our hybrids; of course to be certain we must propagate from cuttings only, but *pubescens* comes pretty true. Still I would not rely on a plantation formed by seedlings even of this variety."

In 1874, Mr. M. sent me a few seeds, from which I have one plant * remaining which reproduces all the character of vigorous growth and promising aspect of the parent plant. It is already between six and seven feet in length, and the leaves reach the length of 9 or 10 inches by 6 inches in width. The plant may be a hybrid; but if so, as admitted by Mr. McIvor, it has much more the characteristics of *C. officinalis* than of *C. succirubra.* I send for the Museum of the Pharmaceutical Society a section of a tree of this sort sent me by Mr. M., from which those who are conversant with the characteristics of the wood of these different species will easily discern what I have stated to be true. A good botanical specimen in a collection given me by McIvor does not appear to settle the question of hybridity.

It remains that I add a parting word about *Cinchona pubescens.* This very distinct species was named by Vahl, and has been described and figured by Dr. Weddel. Not much is known about the β form, but in its form *Pelletierana* it is the source of the bark from whences aricine was procured, and from whence I have myself many times obtained this much contested alkaloid. Its whole chemical constitution is distinct from other cinchonæ, the cinchona red being superseded by an intensely yellow substance. It is no longer to be met with in commerce, as it is useless except for scientific investigation, and has certainly never been introduced into India. So I hope we have heard the last of *C. pubescens*, Howard, though not of the promising sort of *officinalis* which obtained this erroneous name.

* Another has diverged.

COMPARATIVE ANALYSES OF RHUBARBS.

BY PROFESSOR DRAGENDORFF.*

The following analyses were undertaken by the author in order to compare some varieties of rhubarb with one another. Five samples were examined.

I. *Rheum Moscovicum*, imported in 1860 with the last consignment of "crown" rhubarb, and supplied to the author from the Crown warehouse in Moscow.

II. *Rheum Chinense*, as this kind occurred in commerce in 1877, and was delivered from the Crown warehouse in St. Petersburg.

III. Rhubarb from *Rheum palmatum Tanguticum*. A sample of the drug brought by Przewalski from Kansu, the origin of which was the subject of a communication by Maximowicz.

IV. *Rheum anglicum cultum*, purchased in Moscow and corresponding externally with the Rhapontic rhubarb.

V. *A Rhubarb cultivated in Siberia*, of a kind formerly used there in the hospitals, etc., and supplied to the author through Dr. Duhmberg of Irkutsk.

The author describes the process of analysis adopted in examining the Siberian drug, No. V, giving only the analytical data for the other four, except where any variation was made. The drug was in each case reduced by rubbing upon a fine grater and the powder was passed through a sieve having 169 meshes to the square centimetre. In the experiment similar quantities both of the powder and the solvents were used.

(1). *Moisture*.—Upon drying the loss of moisture was as follows:—

No. I.	0·9954 gram	lost 0·0948	gram =	9·52 per cent.
No. II.	0·9807 „	„ 0·1103	„ =	11·25 „ „
No. III.	0·9883 „	„ 0·1023	„ =	10·35 „ „
No. IV.	0·9800 „	„ 0·1086	„ =	11·09 „ „
No. V.	0·9921 „	„ 0·0863	„ =	8·69 „ „

(2). *Ash*.—The foregoing quantities of powder yield the following quantities of light grey ash:—

No. I.	yielded 0·0823 gram	=	8·27 per cent.
No. II.	„ 0·0620 „	=	6·32 „ „
No. III.	„ 0·2379 „	=	24·07 „ „
A second experiment yielded		=	24·03 „ „
No. IV.	yielded 0·0314 gram	=	3·20 „ „
No. V.	„ 0·1030 „	=	10·38 „ „

(3). *Watery Extract*.—Five grams of the powder were macerated for two days with sufficient water to make the volume equal 100 c.c., the mixture being frequently shaken at first, but allowed to stand during the last few hours. The swollen powder now occupied 35 c.c. divisions in the cylinder (No. I. occupied 34 c.c., No. II. 44 c.c., No. III. 44 c.c., and No. IV. 28 c.c.), and yielded upon filtration through a well covered filter about 55 c.c. of extract, this was used in the experiments described in paragraphs 4 to 9. The marc in the cylinder was then washed out with sufficient water to bring the product up to 100 c.c., so that the smallest quantity possible of the solid residue should come upon the filter. Subsequently the entire undissolved portion was placed upon the filter which was laid in a second filter cut from a close gauze material. After draining, the filter and residue were dried at 30° C. until the powder could be conveniently removed from the gauze and the paper, and the remainder of the moisture was driven off at the above temperature. The further operations upon the portion insolubl in water are described in paragraphs 11 to 16.

(4). *Combustible Substances Soluble in Water*.—Upon evaporating in a platinum dish 5 c.c. of this watery extract (0·25 gram of powder), 0·0679 gram, or 27·16 per cent. of dry residue was obtained. The ash in this amounted to 0·0053, or 2·12 per cent. of the powder. The combustible portion of the drug soluble in water amounted to 25·04 per cent. in No. 5.

No. I. yielded 0·1045 gram less 0·0049 gram of ash = 39·84 per cent.

No. II. yielded 0·1044 gram less 0·0069 gram of ash = 39·00 per cent.

No. III. yielded 0·0694 gram less 0·0032 gram of ash = 26·48 per cent.

No. IV. yielded 0·0830 gram less 0·0060 gram of ash = 30·80 per cent.

No. V. yielded 0·0679 gram less 0·0053 gram of ash = 25·04 per cent.

(5). *Mucilage*.—Twenty c.c. of the watery (= 1 gram of the powder) was mixed with 60 c.c. of 95 per cent. alcohol, and after 48 hours thrown upon a tared filter, the precipitate washed with alcohol, dried at 110° C., and weighed. It amounted in No. 5 to 0·0329 gram, containing 0·0021 gram of ash, the mucilage was therefore 0·0308 gram, or 3·08 per cent.

No. I. yielded 0·0347 gram precipitate, with 0·0012 gram ash = 3·35 per cent.

No. II. yielded 0·0167 gram precipitate, with 0·0009 gram ash = 1·58 per cent.

No. III. yielded 0·0183 gram precipitate, with 0·0012 gram ash = 1·71 per cent.

No. IV. yielded 0·0259 gram precipitate, with 0·0004 gram ash = 2·55 per cent.

No. V. yielded 0·0329 gram precipitate, with 0·0021 gram ash = 3·08 per cent.

(6). *Cathartic Acid*.—The filtrate and alcoholic washings were rapidly distilled in a partial vacuum until 5 c.c. of residue remained. This was mixed with 40 c.c. absolute alcohol. Cathartic acid was precipitated, which was washed with alcohol, dried, weighed, and incinerated.

No. I. yielded 0·0548 gram precipitate, with 0·0023 gram ash = 5·25 per cent.

No. II. yielded 0·0513 gram precipitate, with 0·0025 gram ash = 4·88 per cent.

No. III. yielded 0·0223 gram precipitate, with 0·0020 gram ash = 2·03 per cent.

No. IV. yielded 0·0260 gram precipitate, with 0·0010 gram ash = 2·50 per cent.

No. V. yielded 0·0244 gram precipitate, with 0·0184 gram ash = 2·26 per cent.

(7). *Tannin and Chrysophan*.—To another 20 c.c. of the watery extract solution of acetate of copper was added, great excess being carefully avoided; the brown precipitate was at once collected on a tared filter, rapidly washed with the least possible quantity of water, dried and weighed. Its weight, after the amount of copper oxide present had been deducted represented the tannin and chrysophan present. Chrysophan is the glucoside, soluble in water, from which chrysophanic acid is formed.

No. I. gave 0·0298 gram precipitate, less 0·0385 gram copper oxide = 17·13 per cent.

No. II. gave 0·1627 gram precipitate, less 0·0210 gram copper oxide = 14·17 per cent.

No. III. gave 0·1302 gram precipitate, less 0·0480 gram copper oxide = 8·22 per cent.

No. IV. gave 0·0830 gram precipitate, less 0·0347 gram copper oxide = 4·83 per cent.

No. V. gave 0·0976 gram precipitate, less 0·0192 gram copper oxide = 7·84 per cent.

* From a paper in the *Pharmaceutische Zeitung für Pharmacie*, February, 1878.

(8). *Malic Acid, etc.*—With the filtrate of No. 7 neutral lead acetate gave a precipitate consisting principally of malic acid.

No. 1 precipitate weighed 0·0007 gram, about 0·0004 gram of which was malic acid, or 0·04 per cent.

No. 2 precipitate weighed 0·0204 gram, containing 0·0095 gram lead oxide, or 1·09 per cent. of acid.

No. 3 gave only a slight turbidity.

No. 4 precipitate weighed 0·0072 gram, containing 0·0055 gram lead oxide, or 0·17 per cent. of acid.

No. 5 precipitate weighed 0·0229 gram, containing 0·0105 lead oxide, or 1·24 per cent. of acid (malic acid with a little phosphoric acid).

(9). *Sugar.*—The filtrate from No. 8 still contained sugar. It was therefore freed from arabin and cathartic acid with basic lead acetate, excess of lead removed with sulphuretted hydrogen, filtered, the filtrate distilled in a vacuum to a few c.c., the residue made up to 30 c.c. and tested with Fehling's solution.

No. 1	contained equal to	5·55	per cent. glucose.
No. 2	,,	,, 4·27	,, ,,
No. 3	,,	,, 3·94	,, ,,
No. 4	,,	,, 4·40	,, ,,
No. 5	,,	,, 3·66	,, ,,

(10). *Arabic Acid (?) and Undescribed Substance Soluble in Absolute Alcohol.*—Of the 25·04 per cent. of combustible dry substance from the watery extract of No. 5, 18·80 per cent. has been accounted for in pars. 5 to 9. The remaining 6·96 per cent. consisted partly of a modification of arabic acid (?) not precipitated by alcohol, but after treatment with absolute alcohol becoming insoluble, and partially of a substance readily soluble in absolute alcohol; probably a carbohydrate, but not further described.

In No. 1 the total of the substances accounted for in pars 5 to 9 out of the 39·84 per cent. of combustible dry substance was 31·32, leaving 8·52 per cent. of arabic acid (?), etc. In this case the filtrate of par. 6 was evaporated; the residue treated with ether gave only traces of fat, absolute alcohol dissolved 0·2570 gram; 25·76 per cent. (The total of the sugar, chrysophan and tannic acid in pars. 7 and 9 was 29·68 per cent.: difference 3·08 per cent.). Water dissolved the entire remainder of the residue, and gave upon evaporation 0·0687 gram residue with 0·0105 gram ash = 5·82 per cent., indicating here 2·70 per cent. of the substance freely soluble in absolute alcohol.

In No. 2 the results obtained by similarly treating the filtrate of par. 6 were arabic acid (?), 6·23 per cent.; substance freely soluble in absolute alcohol, 6·47 per cent.

No. 3. Arabic acid (?), 2·83 per cent.; substance soluble in absolute alcohol, 7·41 per cent.

No. 4. Arabic acid (?), 8·38 per cent.; substance soluble in absolute alcohol, 8·21 per cent.

(11). *Chrysophanic Acid, Emodin, Erythroretin, Phæoretin, Resin, etc.*—After deducting the moisture, ash, and substance soluble in water there remained of No. 1, 42·37; No. 2, 43·43; No. 3, 39·12; No. 4, 55·89, and No. 5, 55·89 per cent. of combustible substances insoluble in water. The marc from the watery extract was left during six days in contact with absolute alcohol, the tincture filtered through the filter mentioned in par. 3, and the residue washed with alcohol. The filtrate and washings were evaporated in a tared glass dish, and yielded 0·3652 gram, or equal to 7·30 per cent. of residue, containing, besides free and combined chrysophanic acid, emodin, and phæoretin, a considerable quantity of a crystalline dark brown resinous substance, which was also soluble in ether, but difficultly soluble in dilute soda solution. As a subsequent experiment (par. 16) showed that the amount of chrysophanic acid in this sample was equal to 1·01 per cent., there remained for emodin and phæoretin, which was present in only very small quantity, together with the brown resin equal to 6·29 per cent.

The residue from No. 1 gave up to alcohol 0·1110 gram, or after deducting 0·0047 gram of ash equal to 2·13 per cent. of erythroretin, phæoretin, emodin and resin, but no brown crystalline resin; 0·0521 gram was soluble also in ether.

The residue from No. 2 gave up to alcohol equal to 1·15 per cent., containing no crystalline resin or free chrysophanic acid.

The residue from No. 3 gave up to alcohol equal to 3·67 per cent., containing no crystalline resin or free chrysophanic acid; 0·1050 gram of this was also soluble in ether.

The residue from No. 4 gave up to alcohol equal to 5·89 per cent., in which brown crystalline resin was present; 0·0543 gram of this was soluble in ether.

(12). *Metarabic Acid.*—The residue insoluble in alcohol was again dried at from 30° to 40°, powdered, and macerated with frequent stirring in sufficient 1 per cent. soda solution to measure 100 c.c. Of this 50 c.c. (=2·5 gram of the root) were filtered (through the filter mentioned in pars. 3 and 11), neutralized with acetic acid, and mixed with 100 c.c. of 95 per cent. alcohol. After standing 24 hours the precipitate was collected on a filter, dried, and the weight, after deducting ash, represented metarabic acid.

No. 1 gave 0·0869 gram precipitate, with 0·0014 gram ash = 3·82 per cent.

No. 2 gave 0·1438 gram precipitate, with 0·0013 gram ash = 5·70 per cent.

No. 3 gave 0·0656 gram precipitate, with 0·0018 gram ash = 2·57 per cent.

No. 4 gave 0·0826 gram precipitate, with 0·0020 gram ash = 3·22 per cent.

No. 5 gave 0·2118 gram precipitate, with 0·0040 gram ash = 8·47 per cent.

(13). *Starch.*—The remaining 50 c.c. of the mixture was diluted with water to 150 c.c., boiled in a flask, cooled to 50°, a few centigrams of very active diastase added and digested for 24 hours at 40° C. After replacing the evaporated water, 50 c.c. (=1·64 gram of the root) was filtered, and boiled with 8 c.c. of dilute sulphuric acid (1 in 8). After cooling it was tested with Fehling's solution (10 c.c.=0·044 starch).

No. 1	contained equal to	8·40	per cent. of starch.
No. 2	,, ,,	6·20	,, ,,
No. 3	,, ,,	6·32	,, ,,
No. 4	,, ,,	16·50	,, ,,
No. 5	,, ,,	11·95	,, ,,

(14). *Pararabin and Calcium Oxalate.*—The residue after the saccharification of the starch was mixed with sufficient 1 per cent. hydrochloric acid to make 100 c.c. This was macerated for 24 hours, and then rapidly boiled. After making up the evaporated water 50 c.c. was filtered, saturated with ammonia and 150 c.c. of 95 per cent. alcohol added, which precipitated a mixture of a pararabin-like substance and calcium oxalate. This was collected on a filter, washed with alcohol, dried and weighed, and afterwards incinerated.

No. 1 gave 0·2143 gram of precipitate, yielding 0·910 gram $CaCO_3$ = 3·28 per cent. oxalic acid and 3·91 per cent. pararabin.

No. 2 gave 2,179 gram of precipitate, yielding 0·1277 gram $CaCO_3$ = 4·59 per cent. oxalic acid and 2·18 per cent. pararabin.

No. 3 gave 0·2374 gram. of precipitate, yielding 0·1163 gram $CaCO_3$ = 4·19 per cent. oxalic acid and 3·54 per cent. pararabin.

No. 4 gave 0·0886 gram of precipitate, yielding 0·0130 gram $CaCO_3$ = 1·12 per cent. oxalic acid and 1·95 per cent. pararabin.

No. 5 gave 0·1520 gram. of precipitate, yielding 0·0597 gram $CaCO_3$ = 2·15 per cent. oxalic acid and 3·02 per cent. pararabin.

(15). *Cellulose.*—The residue from the powder still remaining was mixed with sufficient concentrated nitric acid to make the mixture correspond with an acid of 1·16 sp. gr., and potassium chlorate added. After macerating several days it was diluted with water, washed, exhausted with dilute ammonia solution, and finally with alcohol. The cellulose was then dried and weighed.

No. 1 yielded	0·3274 gram	=7·45	per cent.
No. 2 ,,	0·3822 ,,	=7·64	,,
No. 3 ,,	0·2456 ,,	=4·91	,,
No. 4 ,,	0·2143 ,,	=4·29	,,
No. 5 ,,	0·4304 ,,	=8·61	,,

(16). *Chrysophanic Acid and Fat.*—Of the substances insoluble in water (see par. 11) there have been accounted for by experiments 11 to 15, No. 1, 28·99, No. 2, 27·46, No. 3, 25·20, No. 4, 32·97, and No. 5 40·49 per cent. This left for further examination in No. 1, 13·38, No. 2, 15·97, No. 3, 13·92, No. 4, 21·94, and No. 5, 15·40 per cent. 1·0133 gram of powdered root (No. 5) was therefore macerated during eight days with 12·5 of petroleum spirit having a low boiling point, afterwards filtered, the undissolved portion washed with petroleum spirit and the liquid evaporated. It left a yellow crystalline residue of chrysophanic acid with a little fat.

No. 1, 1·0446 gram left 0·0005 residue, almost entirely fat = 0·05 per cent.

No. 2, 0·9976 gram left 0·0015 residue, almost entirely fat = 0·15 per cent.

No. 3, 1·0083 gram left 0·0032 residue, fat with a little chrysophanic acid = 0·32 per cent.

No. 4, 1·0041 gram. left 0·0017 gram residue, fat with a clearly recognizable quantity of chrysophanic acid.

No. 5, 1·0133 gram left 0·0103 gram residue, chrysophanic acid with a little fat = 1·01 per cent.

(17). *Colourless Crystalline Resin Soluble in Ether.*—The residue from experiment 16 was treated with absolute ether.

No. 1 gave up to ether 0·0118 gram, of which 0·0015 gram was insoluble in alcohol, and consisted of almost colourless crystalline resin = 0·15 per cent. The portion soluble in alcohol was taken to be erythroretin, phæoretin, and emodin.

No. 2 gave 0·0070 gram, the greater part insoluble in alcohol = 0·70 per cent.

No. 3 gave 0·0167 gram, of which 0·0049 gram = 0·49 per cent. was insoluble in absolute alcohol, leaving 1·18 per cent. of erythroretin, etc.

No. 4 gave 0·0236 gram, the greater part insoluble in alcohol = 2·32 per cent.

No. 5 gave 0·0279 gram, consisting of emodin, erythroretin, resin, and traces of combined chrysophanic acid; the greater part was undissolved by alcohol and left as an almost colourless crystalline resinous mass = 2·75 per cent.

(18). The portion of No. 5 insoluble in ether was macerated with absolute alcohol during six days and lost 0·2094 gram. = 20·75 per cent. As the total substance soluble in alcohol accounted for in experiments 7, 9, 11 and 16 amounted to 18·80 per cent., the difference 1·95 per cent. was reckoned as the substance easily soluble in alcohol, obtained from the watery extract (see experiment 10).

No. 1 gave up to absolute alcohol equal to 26·84 per cent. Experiments 7, 9, 11 and 16 had yielded a total of 23·67. Difference 3·16 per cent.

No. 2 gave to absolute alcohol equal to 26·65 per cent. Experiments 7, 9, 10, 11 and 16 had given a total of 26·08 per cent. soluble in alcohol.

No. 3 gave to absolute alcohol equal to 22·15 per cent. The earlier experiments gave a total of 22·06 per cent. soluble in alcohol.

No. 4 gave to absolute alcohol equal to 26.17 per cent. The earlier experiments gave a total of 23·33 per cent. soluble in alcohol.

The residue from experiment 18 was extracted with water and yielded quantities of mucilage, arabic acid, cathartic acid, and salts, corresponding closely with the previous experiments.

(20). *Albuminoid Substances.*—The mean of the nitrogen determinations indicated the following proportions of albumenoid substances: No. 1, 4·37 per cent ; No. 2, 4·39 per cent. ; No. 3, 4·33 per cent. ; No. 4, 3·17 per cent. ; No. 5, 3·92 per cent. The small quantity of nitrogen present in the cathartic acid was not taken into consideration.

(21). *Insoluble Residue.*—The portion remaining undissolved the author considered to be a mixture of pectose, paracellulose, vasculose, lignin, etc. It amounted in the different specimens to: No. 1, 8·81 per cent. ; No. 2, 10·90 per cent. ; No. 3, 8·68 per cent. ; No. 4, 16·10 per cent. ; No. 5, 10·72 per cent.

The foregoing results are brought together for comparison in the table printed at the end of the article on the following page.

Before comparing the results obtained with each other to assist in forming a judgment as to the relative value of the rhubarbs examined, the author briefly discusses the question as to which are the active constituents of rhubarb.

The active constituent upon which the purgative properties of rhubarb depend the author considers to be cathartic acid, a glycosidal nitrogenous substance, possessing the closest resemblance to the active substance occurring in senna leaves and black alder bark.

The tonic action of the rhubarb probably finds its principal explanation in the tannic acid present. But the high value rhubarb has in practice is in the third place dependent upon the existence of substances which, like chrysophan, by an easily initiated decomposition yield chrysophanic acid, or, like emodin, erythroretin, phæoretin, etc., standing so near to the latter that their similarity in action might be presumed. But since through the study of araroba, etc., attention has been turned to the strongly antiseptic property of chrysophanic acid, and its power to suppress abnormal decomposition processes in the body, probably it would not be a mistake to attribute the frequently surprising action of rhubarb in intestinal catarrh, for the greater part, to the action of these last mentioned substances.

In respect to the amount of cathartic acid, as well as of tannin and chrysophan, the Moscow "Crown rhubarb, No. 1," stands highest among the rhubarbs analysed. If it be considered that the sample examined was already upwards of seventeen years old, and that the easily decomposed cathartic acid would probably during that time have become somewhat diminished, it appears to be subject for regret that the former source of this rhubarb cannot be reopened.

Next to the "Crown rhubarb" in respect to the peculiar constituents, come the best varieties of *Rheum chinense* (No. 2) as at present occurring in commerce, and which so far may be considered a useful substitute for it.

At a considerably wider interval from it stands the *Rheum palmatum* of Przewalsky (No. 3). In the face of the fact that the better sorts of rhubarb show by their structure that they are derived from the stem, whilst the root of *Rheum palmatum* is used, it is not probable that Przewalsky's rhubarb could be identified with them, and this opinion is also supported by the chemical analysis. The rhubarb from *R. palmatum*, which was remarkable also for the large amount of ash it yielded, contained only about 40 per cent. of the amount of cathartic acid present in the Crown rhubarb and about 48 per cent. of the chrysophan and tannin.

In respect to cathartic acid Przewalsky's rhubarb had no advantage over the cultivated English and Siberian rhubarbs (Nos. 4 and 5), but the English was considerably poorer in chrysophan and tannin. The English and Siberian, probably both derived from *R. Rhaponticum*, contained especially a much higher proportion of starch than the other three, and a smaller proportion of cellulose than the crown and the Chinese, but instead a larger proportion of the brown and the white crystalline resins. Finally, the English and Siberian samples were characterized by containing free chrysophanic acid, dissolved out by treating it with petroleum spirit, but which was absent from the other three samples. An admixture of the powder of a Rhapontic rhubarb with that of a better class Chinese rhubarb could therefore be easily detected by exhausting with cold petroleum spirit. Good rhubarb after standing several days would give a colourless extract, whilst one sophisticated with a Rhapontic rhubarb would yield an intensely yellow extract.

	No. 1. Rheum Muscovi-eum. 1860.	No. 2. Rheum Chinense 1877.	No. 3. Rheum palmatum tanguticum 1873.	No. 4. Rheum Anglicum. 1866.	No. 5. Rheum Sibiricum.
Moisture (1)	9·52	11·25	10·35	11·09	8·69
Ash (2)	8·27	6·32	24·05	3·20	10·38
Mucilage, soluble in water (5)	3·35	1·58	1·71	2·55	3·08
Arabic Acid, soluble in water, not precipitated by alcohol (10)	5·82	6·43	3·17	8·32	2·01
Metarabic Acid (12)	3·82	5·70	2·57	3·22	8·47
Pararabin (14)	3·91	2·10	3·54	1·95	3·02
Starch (13)	8·40	6·20	6·32	16·50	11·95
Cellulose (15)	7·45	7·64	4·91	4·29	8·61
Sugar (9)	5·55	4·29	3·94	4·40	3·66
Substance readily soluble in water and in absolute alcohol, probably a carbohydrate (18 and 20)	2·70*	6·47	7·41	8·21	1·95
Cathartic Acid (6)	5·25	4·88	2·03	2·50	2·26
Malic Acid, etc. (8)	0·04	1·09	trace	0·17	1·24
Oxalic Acid, combined with calcium (14)	3·28	4·59	4·19	1·12	2·15
Free Chrysophanic Acid, soluble in petroleum spirit (16)	None	trace	trace	dstinct tr.	1·01
Chrysophan and Tannin (17)	17·13	14·17	8·22	4·83	7·84
Emodin, Erythroretin, Phæoretin, etc. (17)	1·13	1·15	1·18	5·89	6·29
Dark brown Crystalline Resin, etc., soluble in alcohol and in ether (11)	1·00		2·59		
White Crystalline Resin, soluble in ether, insoluble in alcohol (17)	0·15	0·70	0·49	2·32	2·75
Fat (16)	0·05	0·15	0·32	6·17	trace
Albumenoid Substances (20)	4·37	4·39	4·33	3·17	3·92
Paracellulose, Vasculose, Pectose, Lignin, etc.	18·81	10·90	8·68	16·10	10·72
	100·00	100·00	100·00	100·00	100·00

* According to another determination 3·16 per cent.

CINCHONA CULTIVATION IN CEYLON.

BY J. LAKER MACMILLAN.

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Cinchona cultivation in Ceylon is yet in its infancy, but in that transition phase verging from the experimental to the practical.

Statisticians have found it rather difficult to get other than a rough estimate of the area under cultivation, because of the mode adopted of interspersing the cinchona plants amongst those of tea and coffee.

This rough approximate was in 1877 computed at 4000 acres, and I have reason to believe that out of some 3500 acres of land, sold in the vicinity of Newara Eliya, 2000 will by this time have been planted out.

Several millions of plants exist in nurseries ready for planting.

The demand for plants from the director of the Pendeniyá and Hakgallá gardens, and from private sources, is annually computed by the million, and greater than can be met.

The total number of trees planted out must now be close on 7,000,000.

The entire cultivation is carried on by private companies and private proprietors; government so far having only given its attention to the propagation, nursing, and classification of the plants.

Succirubra is the variety in favour, the variety in demand, the variety that pays, and the variety that thrives, it requiring little attention in propagation, and costing next to nothing to rear. It may be found growing luxuriantly everywhere, in the mountain provinces, on fertile estates, and on the poorest patená soils, around government rest houses and remote police stations, in the various Kacheri grounds and gardens of government residences; from the ancient kingdom of Kandy to the confines of the principality of Ouvah. So familiar indeed has it become to the eye of both colonist and native, that it is looked upon as indigenous; the latter, having now the fullest confidence in it as a remedy and not hesitating to help himself to a strip of bark from the nearest tree when occasion necessitates it.

This variety seems to thrive best at an elevation of from 3000 to 5000 feet.

Mr. Wood's remarks in his interesting paper read before the society on the 6th Feb., in regard to the varieties calisaya and officinalis, hold good for Ceylon, that is, success has not hitherto attended their development. Every attention, however, is still being given to their culture by experienced planters, and I doubt not but by the end of the present year definite information will be given as to probable future results.

Ceylon planters have not followed the late Mr. McIvor's instructions as to propagation by seed; that is steeping, cleansing, straining, mixing with dry sand and charcoal, etc. Boxes of an average depth of twelve inches are simply filled with virgin jungle soil and the seeds carefully strewn on the surface, when, with due regard to temperature and moisture, they germinate within twenty days.

The embryo plants are picked from the germinating box and carefully placed in baskets containing a mixture of virgin jungle soil and sand, or placed in carefully prepared beds of the same mixture within a tent of coir matting. At this state of their existence careful nursing is essential, when their development is, comparatively speaking, rapid. When they have attained the height of from twelve to fifteen inches they may be planted out.

Propagation by layering, or by cuttings has not been attended with success in the few instances which have came under my own observation, nor do I believe that such methods are now followed.

Mossing, as recommended by the late Mr. McIvor, after the first harvest, has been tried, but not adopted in Ceylon, for the reason that moss cannot be obtained unless at a considerable expense. There is no doubt however, but that such is the most rational method yet put forward, and the method that must ultimately be adopted, providing that moss, or a substitute for such, can be obtained in sufficient quantity and at a reasonable cost.

It is estimated that by this process of stripping and mossing a yield of 14 to 17 per. cent. of quinine would be the probable limit from good dry bark of the calisaya varieties, and from succirubra bark a proportionate percentage.

This probable limit may look alarmingly large, but if I mistake not, Dr. de Vrij corroborates the statements of the Indian quiniologists on this point, viz., that the renewed bark is progressively richer in alkaloids than the virgin bark; moreover, under the mossing system it is believed that a cinchona tree will go on yielding crop after corp of bark, increasing in richness, for the space of fifty years, that is, providing the operation of stripping and mossing is carefully performed and the condition of the soil attended to. At any rate past experience does not furnish a limit, each succeeding crop predicting a next and a next of greater value. There is reason to anticipate then the large yield of quinine estimated, however alarming the figures may look.

Crops of marketable bark may be collected in the fifth year after planting, but Mr. McIvor has wisely remarked that such bark, "costs more to collect and more for freight," because it is light, and "that the renewed bark produced under the moss becomes to the cultivator fully eight times the value of natural red bark."

A bark realizing from 1*s*. 3*d*. to 1*s*. 6*d*. per lb. costs 1*s*. per pound to place it in the market, including all charges. The profit on this bark is 3*d*. and 6*d*. per lb.; on a bark realizing 5*s*. the profit is 4*s*. per lb.* The red bark collected on the Nediwuthum government plantations realised the following prices in 1875: first crop, eight year old trees, 1*s*. 6*d*. per lb., first renewed bark produced under moss 2*s*. 3*d*. per lb., second ditto 4*s*. 3*d*. to 4*s*. 5*d*. per lb. One thousand trees treated by this method of mossing yielded 8727 lb. of dry bark, that is equal to 8·72 lb. per tree.

In face of this argument, however, in favour of mossing I may give the following facts, which can be corroborated. A three and half acre lot of succirubra, on Sherwood Estate, Hapootela, which I from time to time, for a number of years, had an opportunity of carefully observing, yielded in its eleventh year, an average of nearly 14·5 lb. per tree, a small parcel of which in its ninth year yielded as much as 3*s*. 6*d*. per lb. At the latter age, the superintendent, Mr. Andrews, requested me to collect an average sample of the trunk bark for assay. Strips from twenty trees were taken, dried, powdered, and thoroughly incorporated; this powder yielding me 9·2 per cent. of mixed alkaloids, which, on treatment with ether, gave 2·14 per cent. of soluble alkaloid, representing 0·423 per cent. of quinine.

I recommended that a year or more should be allowed it to mature, which recommendation was acted upon, the result being, as aforementioned, a yield of 14·5 lb of bark per tree. In all, from 406 trees ($3\frac{1}{2}$ acres) 53 cwt., or 1700 lb. per acre. I have not up to the present time learned what this lot realized.

Subsequently I made an analysis of the soil on which the above was grown, which may be worth placing on record:—

Organic Matter	10·29
Phosphoric Acid	·27
Carbonate of Lime	1·28
Sulphate of Lime	·27
Magnesia	·72
Potash	·30
Soda	·11
Oxide of Iron	3·15
Alumina	11·13
Insoluble Silica	72·48—100

This is the mean of the results obtained from the examination of one picked sample and a homogeneous mixture of ten samples taken indiscriminately.

Ceylon planters have much to learn yet in regard to collecting the bark, as well as to curing and sorting it for shipment. Hitherto trunk and branch barks have been simply dried in the sun, and bundled indiscriminately together, rendering it liable to considerable damage in transport. In some instances I have seen it crammed into sacks, whereas, were it piled, classed, and done up into neat bundles, not only would it present a better appearance in the market, and command a better price, but nearly half the amount paid for freight would be saved.

It would be unfair at present to comment on the rough methods used for collecting the bark. Having got over the difficulties of cultivation, I feel confident that planters will now turn their attention to the operations of harvesting, collecting, curing, and classing of the bark, and above all to the conservation of the trees themselves. The method of coppicing or cutting down the trees has many advocates (all easy methods will find advocates); the general feeling, however, is that it is a system of deliberate waste. I myself venture to assert that the loss incurred by the cultivator, though unfelt, is incalculable.

The exports of bark from Ceylon to this country have of late been considerable, and the prices obtained fair. I therefore venture to believe that in a few years this "el dorada" of the ancients will prove a formidable rival to either and all of the continental presidencies in the production of this material alone.

No attempt has as yet been made towards the production of either quinine or mixed alkaloids, there being no active demand for a cheap febrifuge, or even for quinine sulphate itself. The day is, however, not far distant when Ceylon must prove an important factor among the sources of supply of this drug (mixed alkaloids) for the thousands of fever stricken people on the vast neighbouring continent.

* '*Ceylon Times*' Summary.

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THE CINCHONA FEBRIFUGE.

THE letters from Dr. BIDIE and Mr. CORNISH, which are published in the present number of the Journal, will serve to throw additional light upon the subject of febrifuge alkaloid manufacture in India. It was naturally to be supposed that the remarkably indiscreet way in which Mr. WOOD dealt with this subject in the paper he read at the Evening Meeting of the Pharmaceutical Society, and still more in the remarks he made in the course of the subsequent discussion, would not remain without reply from those who were so recklessly impeached by him and by Dr. DE VRIJ. Accordingly, we find in Dr. BIDIE'S letter a statement of the circumstances under which the "cinchona febrifuge" was subjected to trial in Madras, put forward to show that on the part of Surgeon-General SMITH the trial of this article was conducted just in the same manner as that of any other new drug. The report which appeared in this Journal was simply an epitome of the results arrived at by various medical officers, who had given the proposed remedy careful and patient trial. The Surgeon-General had nothing to gain either by praising or by condemning the preparation, and there does not seem to have been the slightest justification for the insinuation made by Mr. WOOD that the unfavourable character of Dr. SMITH'S report was merely a consequence of the disposition of "the Madras people" to find all the fault they could with the cinchona febrifuge made in Bengal. At the time of this singular view of the influence of human nature upon official action being put forward we were indisposed to accept it, but thought its refutation would come more effectually from "the Madras people" themselves.

As regards the comments of Dr. DE VRIJ, we think Dr. BIDIE is quite justified in objecting to them, and to the assumption they involve that the "cinchona febrifuge" really consists of alkaloid to such an extent that its power of neutralizing acids and its capability of being dissolved can be measured by a theoretical standard. In face of the positive statements that the preparation did not dissolve as cinchona alkaloids would do, and the *primâ facie* probability of such a preparation containing extraneous substances that would affect the solubility, there does not seem to be any sufficient ground for the unqualified declaration that the objection as to sparing solubility was not true. Dr. BIDIE reiterates the statement that three drachms of dilute hydrochloric acid of the Pharmacopœia failed to dissolve completely one drachm of the febrifuge sent to Madras for trial, and he adds that no judgment can be formed as to whether that sample was of average character or not, since repeated applications for further supplies have never been responded to.

Mr. CORNISH, the Sanitary Commissioner for Madras, is even more emphatic and circumstantial in his condemnation of the statements made by Mr. Wood, for leaving aside any question as to good taste he does not hesitate to describe those statements as being garbled and incorrect. In support of this view Mr. CORNISH has sent to us a report made by himself to the Madras Government, in which we find many passages that we should have been glad to place before our readers on an earlier occasion had we had an opportunity of doing so. But unfortunately there seems to be some reluctance to furnish copies of these reports at the time they are issued; in our own case, at least, we have failed hitherto to obtain them, and we were enabled to publish the report of Surgeon-General SMITH only in consequence of it having been copied into an Indian newspaper which was forwarded to us.

As Mr. CORNISH was appointed by the Madras Government to report upon the whole subject of alkaloid manufacture in Madras, his account of the matter may be accepted as being based on due familiarity with the facts, and one of the most important points to which he refers is the relative cost of the "cinchona febrifuge" and of the pure sulphates of the alkaloids obtainable in the market. In regard to this point he says that on comparing the out-turn of alkaloids "with the prices at present charged for sulphates of conchonidine and cinchonine, the disadvantage of local manufacture will be still more apparent. Mr. HOWARD'S recent price list quotes sulphate of cinchonidine at 40*s*. per pound, and, at this rate, assuming the drug to cost 50*s*. per pound, landed in Madras, 1233 lbs. might have been bought for the sum which we calculate Government has expended in producing 445½ lbs. of mixed alkaloids. Or, if we look to the price of the cheaper salt, sulphate of cinchonine, quoted at 24*s*. per pound, and assume its value, landed in Madras, at 30*s*., we see that Government might have purchased 2055 lbs. of this preparation for the same sum that 445½ lbs. of mixed amorphous alkaloids has cost."

Another very important point is the waste of alkaloid attending the manufacture of "cinchona febrifuge." According to Mr. BROUGHTON'S results in Madras this loss amounted to as much as 35 per cent. of the alkaloid present in the bark operated upon. This is of course a point of considerable influence in regard to any calculated cost of production based upon the results of analyses and upon the assumption that there is no manufacturing loss. When Mr. Wood's operations are examined in regard to this point, it appears from the official reports that he only obtains something less than two per cent. of "cinchona febrifuge" from bark which he declares to contain on the average from 4 to 5 per cent. of total alkaloids.

Perhaps this relation between the quantity of bark supplied to Mr. Wood for his operations and the quantity of "cinchona febrifuge" obtained from it may be capable of explanation in some way, for with our knowledge of Mr. Wood's ability and skill as an operative chemist, we can scarcely imagine him to be content with results which were attended with such extravagant losses.

However this may be and whatever chance there may be of avoiding such loss in the future it is clear that the result of the "cinchona febrifuge" manufacture has been much less advantageous than the sale of the bark would have been, and to illustrate this Mr. Cornish points out that if the bark used in the manufacture of the Bengal product had been sold in the market it would have realized from £30,000 to £40,000 that might have been spent in purchasing febrifuge preparations of a definite character, whereas the value put upon the "cinchona febrifuge" obtained from that quantity of bark was, according to Mr. Wood's own valuation, only £9000 or £10,000.

But in addition to these questionable aspects of the "Indian home made quinine" business there is very much reason to doubt the soundness of the estimates put forward as to the cost of growing the bark from which it is proposed to make "cinchona febrifuge." The sum of sixpence per pound appears to leave so many things unprovided for that it is merely a fancy amount, having no kind of significance in a commer- point of view, but whatever credit may be assigned to the estimate of cost it does not in any degree reduce the certainty that more can be made of Indian grown bark in the English market than can be made by the attempt to extract from it the alkaloids it contains under all the disadvantages with which chemical manufacture has to be conducted in India.

THE WEIGHTS AND MEASURES BILL.

This Bill has now undergone the ordeal of consideration by a Select Committee of the House, from which it has come in a somewhat modified form. The alterations are not very extensive, but one of them will require the serious attention of chemists and druggists. On a former occasion (see p. 709) it was stated that clause 20 of the Bill, apparently in deference to the wish of the Council of the Pharmaceutical Society, made it permissive to use the "apothecaries' weight" when selling drugs by retail; but it was also pointed out that no provision was made for a scruple or drachm standard, although to be in possession of a weight not of the denomination of some Board of Trade standard was to render a person liable to a fine of five pounds. The Select Committee has removed the inconsistency by expunging the permission to use apothecaries' weight, and in doing so has so far decided that henceforth to sell a drug by the apothecaries' drachm or scruple shall be deemed an offence.

The Bill is now set down for consideration in Committee of the whole House on the 9th of May, and before that time the Parliamentary Committee of the Pharmaceutical Society will no doubt decide whether there is a promise of sufficient gain through the proposed simplification to outweigh the obvious inconveniences that would attend it, or whether an attempt shall be made to restore the permissive sentence. It may be remarked, however, that should the Bill pass in its present form not only will it be illegal to use or even to be in possession of an apothecaries' drachm or scruple weight, but it will be an offence to print any return, price list, or price current in which such weights are quoted, the offence being punishable by a fine not exceeding ten shillings for every copy of such price list or price current published.

With respect to metric weights and measures it will be remembered that as the Bill originally stood it was permissive to keep and use them for scientific purposes, but not for the purposes of trade. The Select Committee has shown a slight increase of favour towards the metric system, by introducing a clause that would allow the Board of Trade, should it think fit, to verify by the standards in its possession such metric weights and measures as might be submitted, provided that the Board be satisfied that such weights and measures "are intended for the purpose of science or of manufacture, or for any lawful purpose not being for the purpose of trade within the meaning of this Act."

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association will be held at 17, Bloomsbury Square, on Thursday evening, April 25, when a paper will be read by Mr. Graham on "Explosives."

The Medical Act Amendment Bill was read a second time on Tuesday evening; the amendments are to be brought forward in Committee, and we shall take the earliest opportunity of publishing any of them which have an interest for our readers.

Transactions of the Pharmaceutical Society.

PRELIMINARY EXAMINATION.

At a Meeting of the Board of Examiners for England and Wales, held in London, on Tuesday, April 16, 1878, the report of the College of Preceptors on the examination held on April 1, was received.

Three hundred and twenty-four candidates had presented themselves for examination, of whom *one hundred and forty-three* had failed. The following *one hundred and eighty-one* passed, and the Registrar was authorized to place their names upon the register of Apprentices or Students:—

(Arranged Alphabetically.)

Alderton, James ....Leamington.
Allison, John George. ....Sutton Bridge.
Althorp, Arthur ....Shipley.
Aspell, John Stanley ....Douglas, I. M.
Aspinall, John William ....Ulverston.
Atkinson, William George ......Ulverston.
Badcock, Harry D. ....Ottery St. Mary.
Bailey, John ....Ludlow.
Baines, Edmund ....Hanley.
Barlow, Charles ....Prescot.
Barrie, David Reid ....Alnwick.
Barton, John........................Warwick.
Baxter, William Smith...........Bradford.
Bennett, William ....London.
Blachford, Jem ....Bournemonth.
Blomfield, George ....Birmingham.
Borthwick, James ....Edinburgh.
Borthwick, Robert Waddell ...Bathgate.
Bowker, Ellis ....Radcliffe.
Briggs, Alfred Henry ....Blackburn.
Brown, John ....Stirling.
Brown, Walter Howard ....Halstead.
Brunsden, Edward Ernest ......Reading.
Burt, Cyril Cecil Barrow.........London.
Campion, Martin Hand ....Louth.
Chaloner, Henry ....Hyde.
Clarabut, Henry Chippendale...Bishops Stortford.
Clegg, John William ....Burnley.
Coates, Udolphus Aylmer ......Walsall.
Cock, John Frederick ....Southsea.
Cook, Henry Mayes..............Braintree.
Corder, Walter Shewell ....Sunderland.
Cosgrove, Henry ....Dumfries.
Cotton, John.........................St. Helens.
Cox, Frederick ....Heckmondwike.
Cragg, Thomas ....London.
Crapp, Arthur ....Reading.
Crowther, William Fearne......Beverley.
Cullen, Augustus Henry.........Hanley.
Dallas, William ....Nairn.
Dauncey, George ....Wotton-under-Edge.
Davis. William......................Ashford.
Davy, Thomas George............Tregoney.
Dawes, Alfred William ....Nottingham.
Deacon, Frederick George ......Frome.
Dewar, Daniel ....Dunblane.
Dewing, James Edward ....Malton.
Dowman, Sydney G. Aldridge.Southampton.
Dryden, Adam ....Edinburgh.
Duncan, William ....Montrose.
Earle, Ernest Haworth............Hull.
Eastwood, Thomas Ernshaw ...Skelmanthorpe.
Edmunds, Henry Herbert ......Mere.
Ellsum, W. Augustine Pridmore.Hingham.
Flack, Charles William ....Stevenage.
Fletcher, Harold Goodwin ......Ripley, Derbyshire.
Foale, Stephen Thomas ....Adelaide.
Foote, Albert Henry ....Coventry.
Giddings, Alfred ....Lancaster.
Golding, Frank Oliver............London.
Goodall, Arthur Abraham ......Fallowfield.
Gostling, Charles Henry ....Diss.
Greensill, Frank ....Douglas, I. M.
Grover, Sydney.....................Lower Norwood.
Hamilton, Henry ....Finchley.
Hansford, Charles ....London.
Harry, Joseph ....Swansea.
Hawking, Frederick Thomas ...Devonport.
Heathcote, George ....Monyash.
Hedley, Charles Alfred ....South Shields.
Hercus, George Logie ....Kirkwall.
Heslop, Henry Hills ....London.
Hewlett, James.....................Northwich.
Highley, Charles ....Rochdale.
Hornby, M. T. ....Stockport.
Horsfield, Frank ....Holbeck.
Jackson, John Thomas ....Scotford.
Jeacock, Frederick Dawson ...Alcester.
Johns, Henry Benjamin ....Southampton.
Jones, Ebenezer Owen............Swansea.
Jones, James Herbert ....Liverpool.
Jones, Lewis.........................Swansea.
Jones, William ....Carmarthen.
Kelly, John Waterson............Birkenhead.
Kennish, Thomas Looney ......Whitehaven.
Kershaw, William Henry ......Sale.
Kirkby, William ....Ripon.
Kirkham, Frank ....Bury St. Edmunds.
Knapp, Charles R. ....Taunton.
Lessel, Robert James ....Dunecht.
Lipp, George.........................Elgin.
Littleboy, John Walter H.......Norwich.
Loxton, Frederick William......Dudley.
Lunan, George ....Banchory Ternan.
Lyon, John Mealmaker ....Dundee.
McBeath, John William.........Darlington.
Mack, George Henry ....Holt.
Maclure, William Lennox ......Glasgow.
Mactavish, Archibald ....Glasgow.
Markham, Walter ....Spalding.
Marshall, Edward..................Ely.
Matthews, John George ....Douglas, I. M.
Mayes, Frederick Henry.........Birchfields.
Mead, Francis Henry ....Taunton.
Metcalfe, William ....York.
Millar, James Hean...............Newburgh.
Miller, John ....Strood.
Milton, Joseph William ....Insch.
Mitchell, Alexander Crichton...Leith.
Monkton, George Joseph ......London.
Morgan, Albert Hall ....Birmingham.
Morgan, John ....Bath.
Mountcastle, William James ...Knutsford.
Murray, George ....Coldstream.
Musgrove, James ....Kendal.
Newton, Percy Montague ......Edenbridge.
Nickolls, John Bate...............Bromsgrove.
Norton, John ....Taunton.
Oakland, Charles John ....Nottingham.
Ogden, Alfred ....Radcliffe.
Owen, Henry J. ....Llandyssul.
Pallister, John ....Carlisle.
Parker, Frank Powdrell ....Whitchurch, Salop.
Patterson, David ....Bolton.
Pearson, Henry ....Nottingham.
Peck, George Samuel ....Baldock.
Price, Thomas Harry ....Brecon.
Pritchett, William Edward......Chichester.
Ralph, Thomas Murphy, jun....Dover.
Ranken, Charles ....Sunderland.
Reed, Alfred Hetherington......Birkenhead.
Rhymer, Albert Henry ....Sunderland.
Rimington, Alfred Harmston...Brigg.
Rumsey, John Herbert Window Dulwich.
Sanderson, William John ......Edinburgh.
Sankey, Joshua......................Wellington, Salop.
Scott, John .. ..Newcastle-on-Tyne.

Scowcroft, James..................Bolton.
Shaw, Alfred James ....London.
Sinnett, William ....Milford Haven.
Slater, James ....Loftus-in-Cleveland.
Smith, Albert Edward............Sudbury.
Smith, Arthur William ....Redditch.
Soutter, James ....York.
Stephens, David ....Huddersfield.
Stevenson, George Miller.........Sunderland.
Sturges, Francis William.........Belgrave.
Sumner, William ....Coleshill.
Sutterby, Frederick Nixon ......Stamford.
Taylor, Henry ....Stockport.
Taylor, John Williams............Norwich.
Thomas, Llewelyn Lloyd.........Bala.
Thomas, Richard .... London.
Thompson, Abraham Lewis ...Birmingham.
Towle, Samuel ....Heaton Chapel.
Treharne, Frederick Gwilyn ...Weston-super-Mare.
Turner, Charles.. ....Hingham.
Turner, John Edward ....Woodbridge.
Vinsen, Frederick Harold ......London.
Wakefield, Robert Clark ......Whitby.
Walker, Benjamin ....Yarm.
Walker, James ....Dundee.
Walker, James......................Lanark.
Walklett, George James.........Oxford.
Wallace, John ....Kelso.
Walton, Leonard ....Crewe.
Warr, John Henry ....London.
Weatherley, Arthur...............New Barnet.
Wheeler, Alfred ....Bristol.
Wildgoose, Thomas Downing ...Dronfield.
Wilkinson, William Henry......London.
Williamson, George ....Glasgow.
Williamson, Henry ....South Shields.
Willoughby, Arthur John ......St. Leonards.
Wilson, John.........................Southsea.
Wincott, Robert Thomas.........Warwick.
Worsley, William..................Wigan.
Wride, Francis Blake ....Shirley.
Wright, William Royle ....Southport.
Yates, George Danson ....Preston.
Young, Ernest Alfred............London.

The questions for Examination were as follows:—

FIRST OR PRELIMINARY EXAMINATION.

April 1, 1878.

(*Time allowed: Three hours for the three subjects*).

I. LATIN.

1. Translate into English the following passages:—

Cæsar suos a prœlio continebat, ac satis habebat in præsentiâ, hostem rapinis, pabulationibus, populationibusque prohibere. Ita dies circiter quindecim iter fecerunt, uti inter novissimum hostium agmen et nostrum primum non amplius quinis aut senis milibus passuum interesset.

Nam etsi sine ullo periculo legionis delectæ cum equitatu prœlium fore videbat, tamen committendum non putabat, ut, pulsis hostibus, dici posset eos ab se per fidem in colloquio circumventos.

2. Decline throughout *hostem, agmen, eos*; and together *legionis delectæ*.

3. Give the present, perfect, infinitive, and supine (where found) of *habebat, prohibere, fecerunt, interesset, dici, posset*.

4. Parse fully—"*Cæsar suos a prœlio continebat.*"

5. Translate into Latin:—*He hastens to set out from the city. On the next day they move the camp from that place. Cæsar makes an end of speaking.*

II. ARITHMETIC.

(The working of these examples, as well as the answers, must be written out in full.)

6. Find the quotient of 9313702853 by 1987, and the product of 46481 and 936, and express the difference in words.

7. Define the terms *gramme* and *litre*, and give as nearly as you can their English equivalents. How many pints are there in 6 décalitres?

8. Simplify $\dfrac{(1\frac{1}{2}+\frac{2}{3}+\frac{3}{4})\times(\frac{4}{15}-\frac{3}{20})}{2\times21\frac{7}{9}}$.

9. Multiply ·0235 by 8·08; and find the value of 3·275 of £10.

10. Find the difference between the simple and compound interest on £41 13*s*. 4*d*. for 2 years at 5 per cent.

III. ENGLISH.

11. State any reasons for considering the English alphabet to be defective.

12. Define *comparative degree* and *superlative degree* in adjectives. What is the usual mode of forming these degrees? Mention six adjectives which do not conform to the rule.

13. Parse the following sentence:—

"Who will undertake it, if it be not also a service of honour?"

14. Write a short essay on *one* of the following subjects:—*Athletic Sports, Cruelty to Animals, The Force of Example, The Advantages of Travelling.*

The following is a list of the Centres at which the examination was held, showing the number of candidates examined at each centre and the result:—

	Candidates. Examined.	Passed.	Failed.		Candidates. Examined.	Passed.	Failed.
Aberdeen	5	3	2	Leeds	11	5	6
Aberyswith	2	0	2	Leicester	2	1	1
Berwick-on-Twd	3	2	1	Lincoln............	4	2	2
Birmingham......	14	8	6	Liverpool	10	5	5
Boston	4	2	2	London..	40	22	18
Brighton	1	1	0	Macclesfield	1	0	1
Bristol	7	5	2	Manchester	25	14	11
Cambridge	9	5	4	Newcastle-on-T.	9	8	1
Canterbury	5	2	3	Norwich	10	6	4
Cardigan	2	1	1	Nottingham......	7	5	2
Carlisle............	3	3	0	Oxford	1	1	0
Carmarthen	4	2	2	Peterborough ...	1	1	0
Carnarvon	1	0	1	Plymouth.........	2	1	1
Chester............	6	3	3	Portsmouth	6	3	3
Colchester	4	3	1	Preston............	12	8	4
Darlington	5	3	2	Reading	5	3	2
Doncaster.........	2	0	2	Salisbury	2	2	0
Douglas, I. of M.	3	3	0	Scarborough......	1	1	0
Dumfries	2	1	1	Sheffield	8	2	6
Dundee............	9	4	5	Shrewsbury	3	1	2
Edinburgh	16	7	9	Southampton ...	4	2	2
Exeter	1	1	0	Stafford............	2	2	0
Glasgow	10	5	5	Swansea	8	4	4
Hereford	3	1	2	Taunton	3	3	0
Hull	2	2	0	Truro	2	1	1
Inverness	2	2	0	Worcester	2	0	2
Leamington	10	5	5	York...............	8	4	4

EXAMINATIONS IN LONDON.

April 10, 1878.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall and Umney.

Dr. Greenhow was also present on behalf of the Privy Council.

MAJOR EXAMINATION.

Seven candidates were examined. *Two* failed. The following *five* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Greenough, Hugh Fairhurst ...Manchester.
Heywood, John Henry ....Lincoln.
Hutton, Harry ....Warwick.
Mather, John Henry ....Newcastle-on-Tyne.
Tompsett, Leighton Stovold ...Strood.

MINOR EXAMINATION.

Sixteen candidates were examined. *Three* failed. The following *thirteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Capern, Francis T. Mesmer ...Weston-super-Mare.
Crooke, Charles Gibbins ....Walsall.
Davies, Hugh ....Machynlleth.
Dawson, George Robert ....Southend.
Graham, Andrew Ward ....Brighton.
Gravill, Edward Day ....Gainsborough.
Greensill, William Joseph ......Birmingham.
Jepson, Alfred ....Swansea.
Phillips, John Edwards ....Cheltenham.
Richards, William ....Nottingham.
Sutcliffe, George Hargreaves ...Bacup.
Tunley, William Henry ....Guernsey.
Wing, William ....Sheffield.

MODIFIED EXAMINATION.

Five candidates were examined. *Two* failed. The following *three* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bradshaw, Charles Henry ......London.
Garrett, James Oliver ....Newport, Mon.
Ramsey, Joseph ....Mansfield.

April 11, 1878.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss and Southall.

MAJOR EXAMINATION.

Seven candidates were examined. *Three* failed. The following *four* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Collinson, Frederick William ...Alnwick.
Mead, Charles John..............Wimborne.
Stephenson, George Herbert ...Hull.
Vernon, William Henry ....Boston.

MINOR EXAMINATION.

Twenty-one candidates were examined. *Seven* failed. The following *fourteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Barrat, Reuben ....Kingston-on-Thames.
Bevan, William.....................Ipswich.
Fowler, George William ....Hackford.
Glaisyer, Edmund ....Brighton.
Hoyle, Richard Ashworth ......Rawtenstall.
Kent, Benjamin John ....Boston.
Parker, Thomas ....Preston.
Roberts, Thomas ....Margate.
Sadler, William, jun. ....Margate.
Sangster, John Graham ....Southsea.
Smith, Peter ....Runcorn.
Stonham, William Burne ......Maidstone.
Street, Walter Charles ....Lincoln.
Thompson, John Hartley ......Sheffield.

April 12, 1878.

Present—Mr. Williams, President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss and Southall.

MINOR EXAMINATION.

Twenty-six candidates were examined. *Eleven* failed. The following *fifteen* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bosher, Alexander ....London.
Chadwick, William ....Lytham.
Chalmers, John.....................Newport, Salop.
Cole, Samuel John ....Exeter.
Higson, John.........................Blackburn.
Holmes, Charles Newman ......Battersea.
Jennings, Francis Rice ....Falmouth.
Madeley, Edward Stanbury ...Barnes.
Morley, John Thomas ....Barton-on-Humber.
Nicholson, Charles ....York.
Pearson, Thomas Styan ....York.
Robinson, Charles Bradshaw ...Great Bridge.
Shaw, William Bourne ....Bridgnorth.
Thomason, Thomas Watson ...Birmingham.
Walton, Henry.....................Manchester.

April 16, 1878.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall and Umney.

MAJOR EXAMINATION.

Seven candidates were examined. *Two* failed. The following *five* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Barrow, Frank Arthur ....Newmarket.
Brown, George German ....Dresden.
Greenhill, Samuel Osborne......Colchester.
Jackson, Henry John ....Bawtry.
Pumphrey, John Henry ....Evesham.

MINOR EXAMINATION.

Nineteen candidates were examined. *Eleven* failed. The following *eight* passed, and were declared qualified to be registered as Chemists and Druggists:—

Aston, Walter ....Tarporley.
Dashwood, James.................Portsmouth.
Davies, John.........................Newcastle Emlyn.
Dodd, William Ralph ....Market Drayton.
Ellis, James ....Southsea.
Griffith, Samuel ....Weston-super-Mare.
Leigh, Marshall ....Middlesborough.
Smith, Joseph ....Salford.

April 17, 1878.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Barnes, Benger, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Southall and Umney.

Dr. Greenhow was also present on behalf of the Privy Council.

MINOR EXAMINATION.

Twenty-four candidates were examined. *Seventeen* failed. The following *seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Blaymire, Thomas Croskell......Kendal.
Broadhead, Richard..............Levenshulme.
Clayton, Christopher ....Market Rasen.
Jones, William Forsyth ....Notting Hill.
Middleton, Christopher ....Thirsk.
Stevens, Henry George Lewis Bury St. Edmunds.
Whitrod, Henry Frederic ......Diss.

PRELIMINARY EXAMINATION.

The undermentioned certificates were received in lieu of the Society's examination:—

Certificates of the College of Preceptors.

Cripps, Richard Augustus ......Upper Holloway.
Jackson, Walter ....Catterick.
Pritchard, Edward Thomas......South Norwood.
Taylor, Alfred J. ....Swansea.
Thomas, Henry Owen ....Rhyl.

Certificates of the University of Cambridge.

Bush, Robert ....Swardeston.
Swift, Augustus Dickerson......Spalding.

Certificate of the University of Durham.

Low, David ....Hexham.

Certificate of the University of Oxford.

Thomas, Richard ....Llanfyllin.

Provincial Transactions.

THE REGISTERED CHEMISTS' ASSOCIATION OF LIVERPOOL.

The Annual Dinner of this Association took place on the 2nd inst., at the Adelphi Hotel. Forty-five gentlemen were present.

After dinner the President of the Association, Mr. J. Abraham, in felicitous terms proposed the loyal toasts.

Mr. A. E. Tanner having given a recitation of "The Raven,"

Mr. J. A. Turner, in a humorous speech, gave the toast of "The Registered Chemists' Association of Liverpool." This was responded to by the Hon. Secretary, Mr. B. Dickins, and by Messrs. Parkinson and Mackinlay. The object of the Association in promoting friendly co-operation for the common benefit was dwelt upon. The Secretary mentioned the gratifying demand that there had been from all parts of the country for the new edition of the price list; and said the Association trusted that the issue of a list generally applicable may be found a service to the trade at large.

The toast of "The Liverpool Chemists' Association" was then proposed by Mr. J. Shaw, who sketched its history, recalling the names of eminent men who in different departments had taken part in its educational work. The President of the Association, Mr. T. F. Abraham, in responding said that although the Chemists' Association from its constitution could not discuss the purely trade matters for the consideration of which the Registered Chemists' Association was formed, yet the more scientific society very much conduced to the welfare of the trade by indicating as occasion arose matters connected with adulteration, etc. Mr. Williams, F.C.S., the Hon. Secretary of the Chemists' Association, also acknowledged the toast.

The Chairman then gave the toast of "The Pharmaceutical Society." He said that its success abundantly proved the wisdom of its founders. He alluded to the able discharge of its duties as an educating and examining body, recalling the names of illustrious men who had been among its lecturers and its councillors. The names of its present lecturers were received with applause which showed that pleasant recollections of Bloomsbury Square were potent with many of the gentlemen present. The work of the Society as a legislative body, by its Benevolent Fund, and by its publication of the *Pharmaceutical Journal* were recognized, and the mention of the last recalled the obligations of the trade to *The Chemist and Druggist* as a trade journal. The toast was responded to by Dr. Symes and by Mr. George A. Redford. The former in eloquent terms recalled the interest of old days at the School of Pharmacy, and the latter fresh from the passage of the Major examination, said that nothing more than steady, patient work was needed to pass what seemed to some a formidable ordeal. Hearty tributes were paid to the kindness of the lecturers and examiners.

Mr. Woodcock proposed the toast of "The Chemists of Chester and Birkenhead." Mr. Shepherd, President of the Chester Chemists' Association, responded for Chester, giving an account of the Society. He alluded with approval to the recent issue of the Liverpool price list, and gave some practical business advice advocating firmness in dealing with objectors. Mr. A. Stewart, in responding for Birkenhead, gave pleasing testimony to their reasonable hour of closing, 8 o'clock; and to the fact that all were closed on Sunday. For other places this is "a consummation devoutly to be wished."

The toast of "The Wholesale Trade" was given by Mr. Fingland in a most happy manner, and responded to by Mr. R. Summer,

The Vice-President, Mr. Redford, proposed "The Health of the esteemed President of the Association, Mr. J. Abraham." This was received in a manner which testified to the appreciation of the services which in an eminent degree Mr. Abraham has rendered to the Association.

The toast of "Our Musical Friends" was responded to by Mr. A. H. Mason, and "The Health of the Vice-President, Mr. A. Redford" having been received with honours, the company broke up, having spent an evening about which there was only one regret, viz., that "it only comes once a year."

CHEMISTS AND DRUGGISTS' TRADE ASSOCIATION.

The first election of General Committee for this Associatian has been held. The following is a list of the gentlemen elected:—

England.

Anthony, J. L., Bedford.	Greenish, Thomas, London.
Stevenson, James, Reading.	Hampson, Robert, London.
Turner, John, Aylesbury.	Owen, John, London.
Throssell, John, Cambridge.	Preston, Alfred, London.
Bates, W. J., Macclesfield.	Slipper, James, London.
Blades, C. M., Northwich.	Urwick, William W., London.
McNeill, J. M., Crewe.	Wade, John, London.
Prockter, John, Penzance.	Pearman, Henry, Newport.
Thompson, Andrew, Carlisle.	Atmore, George, Lynn.
Greaves, Abraham, Chesterfield.	Corder, Octavius, Norwich.
Frost, George, Derby.	Poll, W. S., Yarmouth.
Symons, William, Barnstaple.	Bingley, John, Northampton.
Balkwill, A. P., Plymouth.	Carr, W. G., Berwick-on-Tweed.
Delves, George, Exeter.	Proctor, B. S., Newcastle-on-T.
Tucker, C., Bridport, Dorset.	Parker, W. H., Nottingham.
Mays, R. J. J., South Shields.	March, W., Newark-on-Trent.
Nicholson, J. J., Sunderland.	Prior, G. T., Oxford.
Robinson, James, Darlington.	Cross, W. G., Shrewsbury.
Cole, F. A., Colchester.	Commans. R. D., Bath.
Smith, Nathaniel, Cheltenham.	Prince, Henry, Taunton.
Stafford, William, Chester.	Jones, Charles, Hanley.
Stroud, John, Bristol.	Averill, John, Stafford.
Clift, Joseph, Dorking, Surrey.	Brevitt, W. Y., Wolverhampton
Randall, W. B., Southampton.	Anness, S. R., Ipswich.
Pollard, H. H., Ryde, I. of W.	Whaley, E., Kingston-on-Tham.
Ellwood, M. J., Leominster.	Cortis, A. B., Worthing.
Durrant, G. R., Hertford.	Vizer, E. B., Brighton.
Provost, J. P., Huntingdon.	Rossiter, Frederick, Hastings.
Green, Robert, Woolwich.	Arblaster, C. J., Birmingham.
Barnaby, Henry, Rochester.	Barclay, Thomas, Birmingham.
Bing, Edwin, Canterbury.	Jones, William, Birmingham.
Cotterell, W. H., Dover.	Walker, George, Coventry.
Bagnall, W. H., Lancaster.	Jones, S. U., Leamington.
Hogarth, William, Preston.	Severs, Joseph, Kendal.
Farnworth, Wm., Blackburn.	Atkins, S. R., Salisbury.
Thomas, Richard, Burnley.	Hollier, Elliott, Dudley.
Dutton, Francis, Bolton.	Johnson, T. S., Great Malvern.
Phillips, Jonathan, Wigan.	Thompson, T., Richmond, Yorks.
Robinson, Ralph, Rochdale.	Robson, J. E., Middlesboro'-on-T
Hargreaves, H. F., Oldham.	Whitfield, John, Scarborough.
Benger, F. B., Manchester.	Davison, R., Holgate-Hill, York.
Brown, W. S., Manchester.	Earle, Francis, Hull.
Slugg, J. T., Manchester.	Coupland, Joseph, Harrogate.
Woolley, G. S., Manchester.	Reynolds, Richard, Leeds.
Beecham, Thomas, St. Helens.	Yewdall, Edwin, Leeds.
Abraham, John, Liverpool.	Thornton, Hezekiah, Bradford.
Dickins, Benjamin, Liverpool.	Jessop, Jonathan, Halifax.
Woodcock, Joseph, Liverpool.	Hunter, James, Dewsbury.
Clark, W. B., Leicester.	Hick, M. B., Wakefield.
Palmer, Enoch, Great Grimsby.	Hall, George, Huddersfield.
Maltby, Joseph, Lincoln.	Shaw, H. W., Doncaster.
Pilley, H. T., Boston.	Cubley, G. A., Sheffield.
Andrews, Frederick, London.	Jervis, William, Sheffield.

Wales.

Roberts, Meshach, Bangor.	Davies, D. J., Aberystwith.
Edisbury, J. F., Wrexham.	Davies, R. M., Carmarthen.
Jones, Evan, Bala, Merioneth.	Williams, Thomas, Cardiff.

Scotland.

Storrar, David, Kirkaldy.	Kinninmont, Alex., Glasgow.
Mackenzie, James, Edinburgh.	McAdam, Robert, Glasgow.
Napier, Alexander, Edinburgh.	Strang, Peter, Perth.
Raimes, Richard, Edinburgh.	Burns, D. H., Arbroath.
Borthwick, A. J., Selkirk.	Kerr, Charles, Dundee.
Allan, William, Dumfries.	Ritchie, David, Aberdeen.
Borland, John, Kilmarnock.	Strachan, Alex., Aberdeen.
Davison, Thomas, Glasgow.	Ettles, John, Elgin.
Fairlie, J. M., Glasgow.	MacRitchie, David, Inverness.

Additional Members.

Churchill, W. J., Birmingham.	Shaw, John, Liverpool.
Holdsworth, T. W., Birmingham.	Southall, William, Birmingham.
Laird, G. A., Edinburgh.	Walker, Robert, Birmingham.
Matthews, William, London, W.	

Proceedings of Scientific Societies.

LONDON INSTITUTION.

The Analogies of Plant and Animal Life.*

BY FRANCIS DARWIN, M.B.

Concluded from p. 822.)

We will now inquire whether among plants anything similar to memory or habit, as it exists among animals, may be found.

The most fruitful ground for this inquiry will be the phenomenon known as the sleep of plants. The sleep of plants consists in the leaves taking up one position by day and another at night; the two positions for night and day following each other alternately. The common sensitive plant (mimosa) is a good example of a sleeping plant. The leaf consists of a main stalk from which two or more secondary stalks branch off; and on these secondary stalks are borne a series of leaflets growing in pairs. The most marked character of the night or sleeping position is that these leaflets, instead of being spread out flat as they are in the day, rise up and meet together, touching each other by their upper surfaces. At the same time the secondary stalks approach each other and ultimately bring the rows of closed-up leaflets (two rows on each stalk) into contact. Besides this well marked change the main stalk alters its position. In the afternoon it sinks rapidly, and in the evening it begins to rise, and goes on rising all night, and does not begin to sink until daylight. From that time it sinks again till evening, when it again rises, and so on for every day and night. In reality the movement is more complicated, but the essential features are as I have described them.

In comparing the sleep of plants with anything that occurs in animal physiology, we must first give up the idea of there being any resemblance between this phenomenon and the sleep of animals. In animals, sleep is not necessarily connected with the alternation of light and darkness, with day and night. We can imagine an animal which by always keeping its nutrition at an equal level with its waste would require no period of rest. The heart which beats day and night shows us that continuous work may go on side by side with continuous nutrition.† Mr. Herbert Spencer has suggested that since most animals are unable to lead a life of even ordinary activity during the night because of the darkness, therefore it answers best to lead an extremely active life in day when they can see, and recover the waste of tissue by complete rest at night. On the other hand, certain animals find it more to their profit to sleep in the day and work at night. But there is nothing of this kind in plants; their sleep movements are not connected with resting. Although the leaflets close up, yet the main stalk is at work all the night through.‡ Moreover, owing to the closing up of the secondary stalks of the leaf, the length of the whole organ is increased, and therefore the work done by the main stalk is also increased. So that, far from resting at night, the main stalk is actually doing more work than in the day. Besides this, instead of being more or less insensible, as a sleeping animal is, the primary petiole of the mimosa remains fully sensitive at night, and displays the same property which it shows by day, viz., that of falling suddenly through a large angle on its irritable joint being touched. Besides these points of difference, there is the important distinction that the movements of sleeping plants are strictly governed by light and darkness without any reference to other circumstances.

* A lecture delivered at the London Institution on March 11 by Francis Darwin, M.B. From *Nature*, March 14, 1878.

† Leaving out of the question the repose during diastole.

‡ In mimosa at least.

In Norway,* in the region of continual day, the sensitive plant remains continually in the daylight position—although no animals probably remain continually awake.

There is one—but only a fanciful—resemblance between the sleeping plants and animals, namely, that both have the power of dreaming. I have been sitting quietly in the hot-house at night waiting to make an observation at a given hour, when suddenly the leaf of a sensitive plant has been seen to drop rapidly to its fullest extent and slowly rise to its old position. Now in this action the plant is behaving exactly as if it had been touched on its sensitive joint; thus some internal process produces the same impression on the plant as a real external stimulus. In the same way a dog dreaming by the fire will yelp and move his legs as if he were hunting a real instead of an imaginary rabbit.†

I said that in the regions of perpetual light the sensitive plant remains constantly in the day position. We might fairly expect, therefore, that we should be able to produce the same effect by artificial light constantly maintained. This experiment has, in fact, been made by A. de Candolle,‡ Pfeffer, and others with perfect success. But before the leaves come to rest a remarkable thing takes place. In spite of the continuous illumination, the sleeping movements are executed for a few days exactly as if the plant were still exposed to the alternation of day and night. The plant wakes in the morning at the right time and goes to sleep in the evening; the only difference between these movements and those of a plant under ordinary circumstances is that under constant illumination the movements become gradually smaller and smaller, until at last they cease altogether. When the plant has been brought to rest it can be made to sleep and wake by artificial alternations of darkness and light. This fact seems to me extremely remarkable, and one which, in the domain of animal physiology, can only be parallelled by facts connected with habit. The following case is given me by a friend and is probably a common experience with many people:—Having to be at work at a certain time every day, he has to get up at an early hour, and wakes with great regularity at the proper time. When he goes away for his holiday he continues for a time waking at the proper hour to go to work, but at last the body breaks through the habit, and learns to accommodate itself to holiday hours.

It seems to me that this case may fairly be likened to that of the sensitive plant in constant illumination. There is the same continuance of the periodic movement on the first removal of a stimulus, and the same gradual loss of periodicity consequent on the *continued* absence of the stimulus.

From this kind of habitual action there is but a small step to those actions in which we say that memory comes into play. Dr. Carpenter§ relates the case of a boy who, in consequence of an injury to his brain, never acquired the power of speech or of recognizing in any way the minds of other people. In spite of this mental incapacity he had an extraordinary sense of order or regularity. Thus although he disliked personal interference, his hair having been one day cut at ten minutes past eleven, the next day and every following day he presented himself at ten minutes past eleven, as if by fate, and brought comb, towel, and scissors, and it was necessary to cut a snip of hair before he would be satisfied. Yet he had no knowledge whatever of clocks or watches, and was no less minutely punctual when placed beyond the reach of these aids.

It is hard to say whether this boy actually remembered at ten minutes past eleven that now was the time to have

* Schübler, quoted by Pfeffer ('Die periodische Bewegungen der Blattorgane,' 1875, p. 36).

† This curious phenomenon was first observed by Millardet, who describes it as of rare occurrence. (Millardet, *loc. cit.*, p. 29.)

‡ Quoted by Pfeffer ('Periodische Bewegungen,' p. 31).

§ 'Mental Physiology,' p. 349.

his hair cut, or whether it was an unconscious impulse that made him do so. But whether we call it habit or memory, there is the same knowledge of the lapse of time, the internal chronometry, as Dr. Carpenter calls it, which exists in the sensitive plant, and the same tendency to perform an action because it has been done previously. There is, in fact, hardly any distinction between habit and memory; if a man neglects to wind up his watch at night, he says that he forgot it, and this implies that memory normally impels him to wind it; but how little memory has to do with the process is proved by the fact that we have often to examine our watches again to see that they are wound up. It is the old problem of conscious and unconscious action. If a friend, in order to test our powers of self-control,* moves his hand rapidly near the face, we cannot help winking, though we know he will not hurt us; and when we are breaking through a hedge or thicket, we close our eyes voluntarily to keep twigs out. Here are two actions performed with the same object by the same muscles under command of the same nerves, yet one is said to be directed by the will, and the other by instinct, and a great distinction is drawn between them. It seems to me that the presence of what Mr. Lewes calls "thought consciousness" is not the crucial point, and that if it is allowed that the sensitive plant is subject to habit (and this cannot be denied), it must in fact, possess the germ of what, as it occurs in man, forms the groundwork of all mental physiology.

I am far from wishing to make a paradoxical or exaggerated statement of this resemblance between the periodic movements of plants and memory of the human mind. But the groundwork of both phenomena seems to be the repetition of a series of acts, or the recalling of a series of impressions, in a certain order at a certain time, because they have been repeated in that order and at that time on many previous occasions.

I will mention one more fact in connection with the movements of mimosa, in which the formation of habit is illustrated. Every one knows that a noise regularly repeated ceases to disturb us; that one becomes habituated to it, and almost ceases to hear it. A boy fast asleep inside an iron boiler whilst riveting is going on, is an example of this power of habituation. The same thing occurs with the sensitive plant. A single violent shake causes the main stalk to drop, and the leaflets to shut up; in a minute or two the leaf recovers, and will again react on being disturbed. In order to test the power of habituation, I fastened one end of a thread to the leaf of a sensitive plant, and the other to the pendulum of a metroneme, and placed the plant just at such a distance from the instrument that it received a pull at every beat. The first shock caused the leaf to shut up, but after a few repetitions it became accustomed to it, and I had the curious sight of a highly-sensitive plant unaffected by a series of blows. In nature this power no doubt enables the plant to withstand the constant shaking of the wind.

In spite of the amount of time which has been spent on the study of sensitive and sleeping plants, no satisfactory explanation of the use which the movements are to the plant has ever been given. In the case of the carnivorous plants, we saw that the movements of plants may be offensive, and like the movements of animals in securing their prey. In the case of certain flowers which we will now consider, the movements are defensive, like the closing of a sea anemone. I shall describe these movements with a view to showing the existence of periodicity or habit, and some other general resemblances to animal physiology.

The crocus is perhaps the best example of a flower which opens and shuts in accordance with changes of external circumstances. The crocus is especially sensitive to changes of temperature. If a light index is fastened into one of the petals or divisions of the flower, very small movements are made visible, and in this way it has been shown that the crocus actually appreciates a difference of temperature of one degree Fahrenheit.* I have seen a crocus distinctly open when a hot coal was brought near it. The use of this power of movement is connected with the fertilization of the flower. In the warm sunshine the flower opens wide, and the bees are soon hard at work, and carry pollen from one flower to another. If, now, a cloud hides the sun, the temperature falls, and the crocus begins to close, and by the time the sky has become overcast, and the first drops of rain fall, the precious pollen is housed safe beneath the roof of petals. The crocus is warned of the coming danger by the shadow of the cloud just as the fly is warned by the shadow of the approaching hand. The crocus is sensitive to changes of light and darkness as well as to changes of temperature, and the sum of these influences alternately acting by night and day produces a periodic opening and shutting which resembles the periodic movement or sleep of the sensitive plant. Corresponding to the regular repetition of the stimulus of light and heat, an internal periodicity has arisen in the flower which shows itself in a curious manner. This phenomenon is best shown by certain flowers which are not so sensitive to temporary changes, but which open and close regularly by day and night. Raising the temperature in the evening does not produce nearly the same amount of divergence of the petals as a similar rise in the morning. With the white water-lily, *Oxalis rosea*, and some other flowers, the same thing is well seen.† If the flowers have been allowed to close at the natural hour in the evening it is hardly possible to perceive the least opening of the petals even when the temperature is raised from 50° to 82°. On the other hand a considerable lowering of temperature does not produce so much effect in the morning as it does towards evening. In all biological problems it is necessary to consider the internal condition of the organism quite as much as the other element, viz., the external condition. It is a familiar fact that similar external causes do not produce like results. A man may fall ill after exposure to wet and cold at different times of his life and the kind of illness may be very different. Once it may be rheumatic fever, another time pleurisy, or some other malady, so that in the case of the flowers which, under a given change of temperature, behave differently at different times of day, we see the variability in the internal condition or receptive state of the organism exemplified, the most interesting fact being that the receptiveness varies not capriciously but with periodicity.

The same phenomenon may also be seen when the cycle is a yearly and not a daily one. A German physiologist has lately made a long and patient research on the yearly periodicity in the growth of buds.‡ The method consisted in ascertaining the weight of one hundred cherry buds gathered at frequently repeated intervals throughout the year. In order to discover whether the growth of buds would be equally increased in rapidity at all times by a given increase of temperature, branches were cut and kept in a greenhouse at a temperature of 60 to 70 at various times of the year. This experiment showed that branches thus treated in the beginning of December were hardly at all hurried on in growth, while the rise of temperature at once produced energetic growth in buds in the middle of January. If this fact is to be classed with the very similar effects of temperature on the daily periodic changes in flowers—and I can hardly doubt that it ought to be so classed—a difficulty arises. The buds being new growths, have never experienced a previous winter or spring, so that the periodicity cannot originate in their tissues; it must, therefore, depend on some property common to all the branches, some periodicity common to the nutrition of

* See 'Physiology of Common Life,' vol. ii., p. 200.

* Pfeffer, 'Physiologische Unters.,' 1873, p. 183.

† Pfeffer, 'Physiologische Unters.,' p. 195.

‡ Askenasy, *Bot. Zeitung*, 1877, No. 50, 51, 52; abstract *Naturforscher*, 1878, p. 44.

the tree. Askenasy describes the case as the occurrence of some chemical change which goes on in the buds, rendering them sensitive to rise of temperature at a certain period. The case bears a resemblance to the hybernation of animals. Thus, Berthold* says that when the dormouse, *Myoxus avellanarius*, first goes to sleep in the autumn it can be partly awakened, and then sent into deep sleep by alternations of temperature, answering, like the crocus, to alternations of heat and cold; but when the winter sleep has fairly set in, no effect could be produced by raising the temperature,—just as the oxalis and water lily when once shut for the night could not be made to open.

I have no doubt that many closer analogies will some day be shown to exist between the behaviour of plants and animals, as regards nerve-physiology. The after-effect of stimuli seems to be represented in the movements of plants. If a stimulus is suddenly applied and then removed, the nerves acted on do not cease to be disturbed the instant the stimulus ceases. The molecular change, whatever it is, which goes on in the nerve, cannot leave off directly the stimulus ceases. The molecular action goes on like the vibration of a bell after it has been struck. When a wheel is turned round rapidly before our eyes the image of a new spoke strikes the retina before the image of the old one has died away, so that we cannot distinguish one from another. In the same way a burning stick whirled round looks like a circle of fire. This after effect of stimuli is represented in plants by heliotropism and geotropism. I have myself observed it in the latter. I took a young growing shoot and put it through a hole in a cork, so that it was firmly fixed into a bottle of water. I then put the bottle on its side in a vessel filled with wet sand, and fixed it firmly by piling wet sand over it. The shoot thus projected horizontally from the vessel of sand. It now began to straighten itself by geotropism, that is to say, the tip of the shoot began to curve upwards. I applied a delicate means of measuring this upward movement, and allowed it to continue for some time. I then turned the bottle round on its axis, so as to rest on what had been its upper surface, and the action of gravity being now reversed as far as the shoot went, the tip ought to have reversed its direction of growth, and curved upwards, but instead of this it went on curving towards the earth in consequence of the after-effect of the old stimulus. And it was more than an hour before it could reverse its movement, and again grow upwards.

With this case I conclude my comparison of plants and animals. Some of the points of resemblance which I have attempted to point out are purely analogical. Nevertheless, I have tried to show that a true relationship exists between the physiology of the two kingdoms. Until a man begins to work at plants, he is apt to grant o them the word "alive" in rather a meagre sense. But the more he works, the more vivid does the sense of their vitality become. The plant physiologist has much to learn from the worker who confines himself to animals. Possibly, however, the process may be partly reversed—it may be that from the study of plant-physiology we can learn something about the machinery of our own lives.

* Berthold, *Müller's Archiv*, 1837, p. 63.

Parliamentary and Law Proceedings.

PROSECUTION OF AERATED WATER MANUFACTURERS AND RETAILERS.

At the Huddersfield Borough Police Court, on Tuesday, April 9, before J. F. Brigg (in the chair), W. R. Haigh and J. A. Brooke, Esqrs., John Ellis, Fruiterer, Westgate, appeared in answer to a summons charging him with selling to Mr. E. G. Kirk, sanitary inspector, a certain quantity of food called potass water, to wit four small bottles, which was not composed of the ingredients demanded by the purchaser; and also to answer another charge of selling soda water which was not of the nature and quality demanded by the purchaser.

Mr. E. G. Kirk, sanitary inspector, stated that an information had been laid under two different sections, because he thought he should be able to prove that two distinct offences had been committed. On the 13th of last month, in company with William Jessop, he visited the defendant's shop, and asked to be supplied with four bottles of soda water, and four bottles of potass water, which were served to him by Mr. Ellis himself, and for which he paid 1*s.* 4*d.* After completing the purchase he said to Mr. Ellis, "I am purchasing these samples in my official capacity, for analysis," and asked him if he wished to retain a part, offering at the same time to divide it, according to the terms of the Act of Parliament. He replied "No, I bought it of the South Yorkshire Aerated Water Company, and I sell it in the same way that I receive it. If it's wrong it's the company's fault, not mine, and if I am fined I shall sue them for any damages that they may have caused me." After that he (Mr. Kirk) made the bottles secure, and subsequently numbered the potass water 21, and delivered it to the borough analyst, Mr. George Jarmain, and requested him to analyse it. He had since received Mr. Jarmain's certificate, which stated that the sample was a solution of carbonic acid gas in water, that it contained no bi-carbonate of potass, but ·42 gr. of metallic copper per gallon, which would be injurious to the health of a person in the habit of drinking potass water frequently.

George Brighouse and others, trading together in Fitzwilliam Street, Huddersfield, as the South Yorkshire Aerated Water Company, were summoned for selling, to the prejudice of the purchaser, Mr. E. G. Kirk, sanitary inspector, a certain quantity of food called soda water, to wit, six bottles, which was not of the nature, substance, and quality demanded by the purchaser. The defendants were also charged with selling a certain quantity of food called soda water, to wit, six bottles, which was not composed of ingredients demanded by the purchaser. Mr. S. Learoyd appeared for the defendants.

Mr. Kirk, the sanitary inspector, stated that on the 4th of last month, in company with William Jessop, he visited the manufactory of the defendants, and asked the manager if he would sell him six bottles. Witness paid 1*s.* 6*d.* for the soda water, and paid for the bottles separately. After completing the purchase witness told the manager that he was the sanitary inspector, and that he had purchased the sample for analysis. Witness sealed the bottles, and handed the manager two, two he retained, and afterwards he took two to Mr Jairmain for analysis.

Mr. George Jarmain identified the certificate produced by Mr. Kirk as that of his analysis. In that certificate he stated that he was of opinion that the sample was a solution of carbonic acid gas in water, and contained no bicarbonate of soda, but ·23 gr. of metallic copper per gallon, which would be injurious to the health of a person in the habit of drinking it frequently.

In cross-examination Mr. Jarmain said that 23 gr. to the gallon would be about a 300th part of a grain to half a pint. It was possible that if there was an accident in the joining of the apparatus some of the copper might have come off through the tin being worn off. Excluding the metallic copper the article he analysed was probably very nice; but he did not take it himself, and he did not think there was much in it. It might be a pleasant drink on a hot summer day, but it was not soda water. There was nothing injurious in it excluding the copper. The soda water of the British Pharmacopœia contained 30 gr. to one pint of water. Soda water of that standard was too alkaline for common taste. It was medicinal, and distasteful to the palate. He knew that the quantity of soda in Schweppe's soda water bottles varied, but not that some contained none. He was not aware of any soda water that had ever been sold as a beverage that contained more than five grains to the bottle. Soda water did not properly describe aerated water which had no soda in it. The B.P. soda water was introduced into the British Pharmacopœia in order that medical men might have an article of a standard strength. He thought soda water with thirty grains of soda to the half-pint would be deleterious if taken constantly as a beverage, but he would not say very deleterious. He should call an article soda water because it contained soda. If there was one grain in it he should call it soda water, but he must fix his limit at one grain. If it contained seventy-five grains to the bottle it would still be soda water, but there would be too much soda in it. They had soda water made in the town that contained from three to five grains of soda to the bottle. A pound of soda, which cost 1*s.*, would make 1200 bottles.

Richard Henry Inman, aerated water manufacturer, Huddersfield, said he had not come there to give evidence against the South Yorkshire Aerated Water Company; he came to the court to hear the cases, but having heard Mr. Learoyd say that in the trade soda water was universally understood to contain no soda at all, he entirely objected to that, because it was not so understood by his firm nor by other firms. His firm's soda water always contained five grains of soda to the bottle, and it was totally impossible for it to vary. The soda cost very little, and made very little difference to the cost of the article.

Mr. Learoyd addressed the Bench for the defence, and contended that there was no standard of soda water as a beverage, and that the name of soda water did not indicate the ingredients at all. The standard of British Pharmacopœia was altogether unpalatable. One of the offences charged was that no person should sell any compound, article of food, or compound any drug—which this was—which was not composed of ingredients in accordance with the demand of the purchaser. Before a person knows the ingredients demanded the purchaser must ask for the ingredients. Asking for soda water was not asking for the ingredients, and what was called soda water was understood to be aerated water without soda in it. With reference to the copper, where anything arose from mere accident the person who was the creature of the accident was not accountable for it. This was purely an accident from the machinery having got out of order.

In reply to the Bench,

Mr. Kirk said he could not admit that, because from three months prior to and three weeks after he obtained these samples the same state of things continued, which showed it was negligence.

Mr. Learoyd said the defendants had had no notice of the facts.

The Chairman said at present the Bench thought it was an accident.

Mr. Kirk remarked that Mr. Ellis told him he purchased his before Christmas, and that actually contained more copper than the sample he got at the company's works.

The Bench, at this stage, decided to hear all the evidence before deciding on this point, and at this stage the case was adjourned until Saturday morning.

At the adjourned hearing—

Mr. Mills, the magistrates' clerk, said there were two summonses in this case—one under section 6, which was for selling soda water which was not of the nature and quality demanded, and to the prejudice of the purchaser; and the other under section 7, which was for selling a compounded article—a food or drug—which was not composed of the ingredients demanded by the purchaser; but, as both summonses had relation only to one set of circumstances, he thought it was quite clear the magistrates would not inflict penalties, assuming the charges to be proved, under both those sections. He thought the charge under section 6 should be abandoned, and that they should rely on that under section 7, in accordance with the argument used on the previous day.

Mr. Haigh pointed out that the charges were distinct—one was in relation to prejudice, meaning that a consumer would be liable to suffer in health if he continued taking the water; and that referred to the copper part of the business.

Mr. Mills said at all events he thought it clear that the Bench would not convict under both sections. If they were going on with the case as regarded prejudice the gin case was of very great importance; but they would remember that the evidence of Mr. Jarmain was that there was no injury whatever. Under section 7 Mr. Learoyd's argument was, as he understood it, that it only——

Mr. Learoyd said section 6 referred to the sale of an article of food which was not of the nature and substance demanded by the purchaser; and section 7 related to not supplying the ingredients which were specified at the time the order was made.

Mr. Mills said his interpretation of section 7 was that it related to a specifically compounded article. Soda water was a general name by which an article was supposed to be composed of certain ingredients; and if a purchaser demanded soda water he assumed, and had a right to assume, that that soda water contained ingredients which soda water properly made did contain. In answer to this Mr. Learoyd quoted the gin case, and said that aerated water was generally sold in this town and neighbourhood under the name of soda water, and that, therefore, was a commercial article, that persons who asked for soda water were supplied with aerated water, and that there was no offence under either of the sections. But there was a case under the old Act which seemed to him (Mr. Mills) to throw considerable light upon this Act of Parliament (the Sale of Food and Drugs Act)—namely, the case of Roberts *v.* Edgerton (9 L. R., Q. B.), in which a man had sold as unadulterated green tea which had been adulterated. It was faced with gypsum and Prussian blue for the purpose of colouring it. This was not known to the public. Pure green tea was imported from Japan. It was contended that as green tea was sold in the trade this coloured green tea that came from China was a commercial article, and, therefore, the purchaser who got it got [what he demanded; but it was also shown that pure green tea came from Japan, and, as the public did not know that there was this adulterated green tea, they had a right to assume that when they asked for green tea they got the pure article. The judges—Cockburn and Blackburn—both held that the public had a right to be supplied with the pure article when it was demanded, even though they only asked for green tea; and applying the same principal to the case now under consideration, his (Mr. Mills) opinion was that although to those who were in the trade, and made it, it might be perfectly well known that what was known as soda water had no bicarbonate of soda in it, yet if the fact were not known to the general public then the defendants were not relieved from the charge under the section 7. A person who asked for soda water believed, and had a right to believe ,that there was bicarbonate of soda in it in some proportion.

Mr. Learoyd: Even though it had the name and was known by the name of soda water.

Mr. Mills again said that a person asking for soda water had a right to assume or believe that there was some proportion of bicarbonate of soda in it; but if Mr. Learoyd could show that the public did not so believe, and that they were not prejudiced by the sale, then it would be another matter, but, in his opinion, what the magistrates had to decide was this, whether or not, when Mr. Kirk asked for soda water, he was served with that which correspond with what he demanded, there being in the water no bicarbonate of soda whatever.

Mr. Learoyd: There is the question of law.

Mr. Mills said it was rather a question of fact. The public, when they ordered soda water, assumed that there was some proportion of soda in it: in this case there was none, and he considered that upon that fact there must be a conviction. If the magistrates, however, found that the public must know that there was sold under the name of soda water that which contained no bicarbonate of soda then that would be another matter, as he before remarked; but he did not think that the mere fact that it was known to the trade that what was sold as soda water contained no bicarbonate of soda got the defendants out of the difficulty. He considered that they must go further, and show that the knowledge extended to the general public, and that the purchasers were not misled at the time. His interpretation of clause 7 was that inasmuch as the soda water contained no bicarbonate of soda there was an offence within the meaning of the Act of Parliament, unless upon the facts the magistrates found that the fact was so generally known to the public that they could not be misled by it, in which case there would be no offence.

Mr. Haigh pointed out that if a person wished to have a drink as a beverage without any soda in it he would not ask for soda but for aerated water.

Mr. Learoyd said he thought that if his client knew that they must have another christening day. He bowed to the decision of Mr. Mills, who was supreme in that court, but there were two points which struck him in the case quoted by Mr. Mills; the first was that the article in question was a natural one, and was not compounded; and the second was that the article was adulterated by the addition of something to it.

Mr. Mills said that was so. The whole tenor of the decision was that there were two classes of tea, both known in the market as green tea. It was perfectly known to the trade that one class of the green tea was coloured, and that there was pure green tea; and Justice Blackburn held that as this was so the fact of its being known to the trade did not relieve them from liability, because the general public were not aware of the distinction.

Mr. Learoyd: That is actual adulteration.

Mr. Mills said it was not a question of adulteration here—it was a question of omitting the potass or soda from the water sold as potass or soda water.

Mr. Learoyd said the sixth section had reference to the article, and the seventh to a person asking for certain ingredients.

Mr. Mills: Section six would apply to milk.

Mr. Learoyd said that soda water was both a drug and a beverage. As a drug undoubtedly it must contain soda. As to the soda water supplied by the defendants, all he could say was that it was highly appreciated, and he believed that it was very agreeable even without soda in it. He thought there would be no controversy between scientific men on this, that one or two grains of soda would make no difference whatever, and that it would not make it more beneficial. He might point out that in the soda water their worships were accustomed to drink there was not more than a grain and a-half to a certain quantity of water. All he could say was that it was well known to the trade.

Mr. Brigg (the chairman): Well known to the makers.

Mr. Haigh said that 99 out of 100 persons who asked for soda water expected to get it.

Mr. Learoyd: They would expect to get what they liked.

Mr. Mills said that Mr. Inman stated that some makers put soda in, and some did not.

Mr. Learoyd said his clients were only anxious to do what was right. They paid very great deference to the views of the magistrates, and if the Bench thought there should be a new christening day, as he had suggested before, they were quite willing to have it, and not to let anything go out of their place as soda water unless it had soda in it. It was no benefit to the defendants, and he thought the Bench would have come to the conclusion that there had been no intention whatever to impose upon the public, or to obtain any advantage over the public, or to adulterate any article to the prejudice of the public. The question of cost was nothing—had nothing to do with it; and the defendants had done nothing affirmatively wicked, he hoped, under the statute, having only sold this to the public as soda water, that name having been given to it by the public.

Mr. Haigh said the name had not been given to the article by the public, but by the makers of the article, and when the name had been given to it, the public asked for it under that name undoubtedly.

Mr. Learoyd said that when the case started he thought there was a standard for soda water—a standard according to the British Pharmacopœia. Of course it came to this now, that they would have to sell either soda water or water without any soda at all—and in future they would sell nothing as soda water which did not contain bicarbonate of soda.

The Bench: That which you sell as soda water must have soda in it.

Mr. Learoyd said that as regarded the other water, they would undertake to sell it as aerated water. Considering that his clients had done nothing which was intentionally wicked or wrong, or been guilty of adulteration, and that they would undertake to pay the costs, he hoped the Bench would not regard it as a case for a penalty.

Mr. Kirk said that as far as he was concerned he did not wish to show any vindictive spirit towards these people; still the offence was of a serious nature, and he really must press the case.

Mr. Brooke: The serious part of the case is the copper. That is prejudicial to health.

Mr. Mills said that as the case stood, upon the interpretation he had given to section seven, Mr. Learoyd confessed that there was an offence; and he asked had he anything to say to the magistrates with reference to the copper?

Mr. Learoyd said that all he could say was, that the best makers had made the machine; that a crack had been found in the joining, which was not found without the most careful examination.

The Chairman said that although the company had not been guilty of any underhand work in manufacturing the soda water, the case was of such importance that they must convict. The conviction would be in no way excessive, they would make only one conviction, namely, under section 7.

Mr. Learoyd said he could call a number of persons to prove that the aerated water was known as soda water, and he should ask the Bench to find upon a question of fact. He could call overwhelming evidence to shew that this was known to the trade as soda water, and upon that the question of law would turn.

Mr. Haigh remarked that Mr. Kirk might call 300 ignorant people, who were not supposed to know anything about the matter, and the question arose did the public when they asked for soda water expect to get aerated water.

Mr. Kirk said he thought he could call 300 intelligent people to prove that they expected to get soda water when they asked for it.

After some further conversation, in which Mr. Learoyd assured the Bench that he was not going to take counsel's opinion on the matter, it was arranged that the case should be adjourned to the 24th inst.

Mr. Kirk asked that in the meantime the defendant's might be restrained from selling any water they had now in stock.

Mr. Learoyd said the cylinder was in London with the makers undergoing an entire supervision, and the defendants were making nothing at all just now.

Mr. Kirk said there might be a large quantity in stock.

Mr. Learoyd: We shall sell no more copper.

Mr. Mills: It has all been made out of the same machine.

It was arranged that a sample from each kind of water in stock should be submitted to the analyst in order that it might be tested, and if it was found that there was any copper in any of the samples the whole of the stock should remain unsold.

The cases against the other persons who had been summoned for a similar offence were adjourned.

Dispensing Memoranda.

[54]. Creasote Pills.—Lest silence on my part as well as on the part of the writer of the "Month," from whom I expected some explanation, should convey consent to the views of "Pil. Creasoti" and others on this subject, as a Pharmaceutical Examiner in Dispensing, I again utter my protest to the use of light calcined magnesia as an excipient for making creasote into pills. If magnesia may be used in the case referred to where two minims of creasote have to be combined with two grains of compound rhubarb pill with the sanction of the *Pharmaceutical Journal*, it will naturally be inferred by dispensers generally that magnesia may be used as an excipient to make creasote into pills whenever it is ordered, and with the results I have stated, that the pills will in most cases be insoluble. It is true that two minims of creasote can be made into a pill with one grain of magnesia, but it takes hours before the mass becomes sufficiently firm to form pills; but creasote is generally "used with success to arrest certain forms of vomiting" (Garrod), and either the patient for whom creasote pills are ordered must endure this for some hours, when he expects to have his pills in ten minutes—or, which is much more probable, the dispenser will expedite the process by putting more magnesia to the mass, sufficient to enable it to be rolled out quickly. Yet either in the case of a pill made with one grain of magnesia and two minims of creasote, or with two grains of magnesia and two minims of creasote (such as I referred to before), both of which I have made and tried by boiling with water in a test tube with no perceptible action;—only a very slight odour of creasote was evolved—they were not disintegrated, and both are indigestible, as I have experimentally proved. Mr. Savage also has shown that pills so made are insoluble in boiling water.*

"Pil. Creasoti" says in his first letter, "When creasote is prescribed in the pilular form it may be assumed that the writer has a definite object in view and desires the slower action of the pill as compared with that of an emulsion." I think this is erroneous. Creasote is mostly prescribed in a pilular form, because it is the only way in which physicians can get their patients to take it. In my large experience in dispensing I do not remember once having to dispense it in a liquid form for internal administration.

But setting aside the solubility and the slower or quicker action of the pills of creasote with magnesia, I hold that the addition of magnesia to creasote pills is not justifiable. Creasote is not creasote when combined with magnesia any more than epsom salt or plaster of paris is sulphuric acid, and no dispenser of medicines is justified in substituting a salt of a corrosive acid for the acid itself in either case. If the physician wanted the salt he would have ordered it. "Pil. Creasoti" in effect says they are the same thing, or that one will do as much good as the other. The onus rests with him to prove this, not with me the negative.

My object is not hair splitting with an anonymous correspondent about metallic oxides or "caustic alkalies decomposing creasote" when they combine with it (let the "prentice hans" try it with oxide of silver), but to point out the glaring diversity of results which will be obtained by a patient having his creasote pills made up at different establishments, or by different dispensers in the same establishment, if the Journal of the Pharmaceutical Society says magnesia may be used. Such diversities, where uniformity is expected by the public, are too frequently complained of as it is. "Honour and good faith toward the customer, or patient, will not permit defects in the consistence or plasticity of a pill mass to be remedied by additions unauthorized by the prescription, as is unfortunately too often done by careless, inexperienced, and unscrupulous manipulators" (Cooley).

Wm. Martindale.

* *Pharm. Journ.*, 2nd series, vol. xi., p. 200.

[92]. Undoubtedly Magnesia, B.P., known in the trade as Mag. Calc. Pond., unless the prescription was written prior to 1864, in which case the light calcined variety would be meant. Unfortunately this change in nomenclature has caused much confusion, so that the ponderous kind is unknown in many pharmacies.

J. B. L. M.

[93]. Dissolve the salt in the requisite quantity of water and add the fluid extract of bark in successive portions, shaking on each addition. A flocculent deposit separates, but is readily diffused throughout the liquid on agitation without adhering to the sides of the bottle.

J. B. L. M.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Bengal "Cinchona Febrifuge."

Sir,—Having just seen in your Journal of February 9, 1878, the report of the discussion which ensued on the reading before the Society of Mr. Wood's paper, on "The Progress of Cinchona Cultivation and Alkaloid Production in Bengal," I have to request permission to offer a few remarks on some of the statements made on that occasion by Dr. De Vrij and Mr. Wood.

But before entering on these it seems necessary to explain the exact position which Dr. Smith, Surgeon-General, Madras, occupies with respect to experiments such as those conducted with the Bengal "cinchona febrifuge." It must be clearly understood that he is purely an administrative officer, standing in the same relation to the State Medical Department of Madras as the Director-General at the War Office does to the Army Medical Department in London. When a new drug, therefore, is sent by Government for trial he has neither the means nor the leisure to conduct the experiments under his own personal observation. In such cases the article is issued to hospitals presided over by officers of experience, whose judgment can be relied on, for trial and report. This is precisely the course which was adopted in the case of the Bengal "cinchona febrifuge," and Dr. Smith's report, which appeared in the *Pharmaceutical Journal*, vii., page 499, was simply an epitome of the replies received from the executive medical officers, who had given the remedy a patient and most careful trial. The Surgeon-General had no object to gain either by praising or condemning the preparation, but simply as the head of the medical department had to communicate to Government a plain, unvarnished report of the results of the trial as communicated to him by his subordinate medical officers. It seems rather ungenerous, therefore, on the part of Mr. Wood, in referring to Dr. Smith's remarks on the drug, to say, that "it was in human nature that the Madras people should be prepared to find all the fault with it they could," inasmuch as, according to Mr. Wood, the Madras Government had tried to make a similar preparation and failed. Such a statement does not say much for Mr. Wood's ideal standard of official integrity, and is hardly one that should be directed by one gentleman against another, besides against an officer holding the highest office of trust and responsibility in his department which Government can confer on him. I might also mention here, as an illustration of the feeling created in Bengal by the adverse Madras report on the "cinchona febrifuge," the fact that since its publication no further supplies of the preparation have been sent down for experiment, although repeatedly asked for by the Madras authorities. In other words, Madras is prepared to give the drug another fair trial, but the friends of the preparation have apparently shrunk from this fresh ordeal.

With regard to Dr. De Vrij's remarks that "it was well known that 324 parts of quinine required 36·5 parts of pure HCl, and that 308 parts of cinchonine or cinchonidine required the same quantity for solution," and that therefore Dr. Smith's statement as to the insolubility of the "cinchona febrifuge" could not be correct, I must say that I fail to see the force of the argument. Apparently Dr. De Vrij's logic amounts to this: Because the pure alkaloids only require so much HCl to effect their solution, therefore the Bengal preparation can only require the same amount. Dr. De Vrij seems entirely to forget that the "cinchona febrifuge" does not consist merely of mixed alkaloids, but contains a large quantity of extraneous matter. It is quite possible that the supply of the "cinchona febrifuge" sent to Madras for trial was not of the best quality, but the fact remains that three drachms of dilute hydrochloric acid failed to dissolve completely one drachm of the febrifuge in two ounces of water. The acid used was the ordinary dilute acid of the Pharmacopœia, and there can be no doubt about the results, as I witnessed the experiment, and can affirm that the statement is absolutely correct.

In conclusion, let me remark that Surgeon-General Smith is *officially* as much interested as Dr. De Vrij and Mr. Wood are *personally* in securing a cheap and efficient cinchona febrifuge for the people of India, but the way to obtain this is not for interested parties to carp when their pet preparation receives adverse criticism, but rather to accept this in a generous spirit, and try to produce something better.

G. Bidie, M.B.,
Surgeon-Major,
Secretary to the Surgeon-General, I.M.D., Madras.
Surgeon-General's Office, Indian Medical Department,
Fort St. George, Madras, March 22, 1878.

Sir,—Your issue of the 9th February, contains a paper by Mr. C. H. Wood, F.C.S., "On the Progress of Cinchona Cultivation and Alkaloid Production in Bengal," and a report of the discussion of the Society on that paper. As a question of taste, it seems to me that Mr. Wood might have acknowledged the labours of Mr. J. Broughton, the late quinologist of the Madras Government, inasmuch as those labours directly led to the modified process adopted by Mr. Wood in his extraction of the rough alkaloids of the cinchona bark, and as Mr. Broughton, since his mysterious disappearance in 1875, is not present to assert his own claims; but on this score Mr. Wood is responsible only to himself. What I have to complain of is that Mr. Wood has given a garbled and incorrect account of the reasons which induced the Madras Government to discontinue local manufacture of the rough alkaloids. He says, according to the report, "Madras had produced a similar preparation from its plantations, and this preparation had failed and had been abolished because the Madras people could not make it pay."

As I was appointed by the Madras Government in the year 1874 in conjunction with the Commissioner of the Neilgherries to report on the whole question of local manufacture, I have forwarded by the present mail a copy of our joint report on the subject, from which you will see that Mr. Wood, in the above summary, has not given a correct account of the matter. The report is too long to be reprinted *in extenso*, but I will ask you, if you have space, to give such extracts as may be of interest to the pharmaceutical world, and which will serve to justify the action of the Madras Government in suspending its manufacturing operations during a period when its cinchona barks were fetching abnormally high prices in the open market.

Mr. J. Broughton, in his experimental manufacture of rough alkaloids, found that there was a considerable waste of product and that his operations on a large scale failed to yield the amount of alkaloid ascertained to be present by analysis of samples. On the whole his out-turn of alkaloid was about 35 per cent. below the quantity present in tested samples.

Mr. Wood's operations on a larger scale, and by his modified process, show even more unfavourable results than Mr. Broughton's, but I observe he has studiously avoided touching on this aspect of the question in his paper.

Mr. Wood tells us that the bark of the roots of the *C. succirubra* in Bengal gives from 7 to 8 per cent. of alkaloids, and that the stem bark yields from 5 to 6 per cent., while the branch bark gives a smaller yield. Taking the average product of the bark used up in his manufactory in fair proportions of root, stem and branch bark, Mr. Wood says that "the average bark of the plantations contains from 4 to 5 per cent. of total alkaloids."

I observe that in the year 1876–77, the bark operated on was in the following proportions—root and stem bark 57 per cent., and branch bark 43 per cent. It is assumed by Mr. Wood in his paper throughout, that the annual supply of bark from Bengal will yield 4 per cent. of his cinchona febrifuge.

Now please observe the practical commentary on this estimate. In the last two years Mr. Wood has had delivered over to him by the superintendent of the plantation, and has actually used up, 297,928 lbs. of dry bark of the *C. succirubra*, and his official reports show that he has made out of this quantity of material, 5739 lbs. of impure alkaloids, or just 1·9 per cent. By his own showing he has lost in the process of extraction more than one half of the total alkaloids present in the bark.

Mr. Broughton's losses in this respect were only 35 per cent. and latterly much less, but we now find Mr. Wood taking credit to himself for an improved process of manufacture whereby he loses, by his own showing, not far short of 60 per cent. of the febrifuge his analyses show to be present in the bark.

Mr. Wood has not thought proper to allude to these facts, the data for which are taken from the official reports of Dr. G. King, the superintendent of the Bengal cinchona plantations; I have ventured to do so for him, and shall be glad to learn how Mr. Wood can reconcile the estimates in his paper of a 4 per cent. yield, with the actual out-turn of 1·9 (less than two) per cent. of alkaloids. Would any manufacturing chemist depending on his skill and experience for remuneration be content with such results? Surely any chemist working with a view to profit would not be content with so great a waste of valuable material, yet Mr. Wood passes the subject by in silence, just as if his operations had resulted in a great financial success to the Bengal Government, and as if he had really produced a "cheap" febrifuge.

If the bark used in this crude manufacture had been sold in the market, the Government of Bengal might have had from £30,000 to £40,000 to spend in providing crystalline salts of alkaloids, of known and definite composition, for the fever stricken population of the country, in the place of the product you graphically describe as a "*mischmasch.*"

Let me, in conclusion, say that in my judgment the method of keeping the accounts of the cinchona estates in Bengal is such as to render extremely fallacious the estimate that dry bark can be produced and sold at a profit for sixpence a pound. This very question was inquired into by myself and colleague in regard to similar estimates made for the Madras plantations, and when we came to cross-examine the late Mr. McIvor, he was obliged to admit that his estimate had reference only to the expenses of up-keep and bark collection, and that it had been made without any reference to outlay in forming the estates, interest on unproductive capital, rent, taxes, etc. No data, in fact, yet exist showing the cost of production, and the whole question of a cheap febrifuge hinges on the problem whether bark can be cultivated at a profit on commercial principles.

The Government of India is naturally very anxious that the product of its cinchona gardens should be placed within the reach of the people of India with the least possible delay, but unless the cultivation is of a nature to yield a profit, it is very evident that any measures traversing the well established laws of supply and demand would discourage private enterprise and thus protract indefinitely the advent of the time when every man shall be able to buy a dose of quinine just as he now buys his daily supply of opium or hemp. A fictitious cheapening of cinchona can serve no useful or lasting purpose, and no crude and wasteful extraction of alkaloid can help on the cause we all

have at heart—the benefit of the Indian people and the human race at large. W. R. CORNISH, F.R.C.S.,
Sanitary Commissioner for Madras.
Madras, March 23, 1878.

THE ELECTION OF COUNCIL.

Sir,—The election of an efficient Council is a matter of some importance to the Society. It has often appeared to me an anomaly that we should be called upon to vote for men whose opinions are utterly unknown to us until after their election they are reported in the Journal, and therefore it seems an advantage to have anything in the shape of an address. Such an address is now before me, and I take it to be a document of such a public character that it is fit subject for comment in your columns. It is signed by the "principal" of a "college" in London, who says that he should, if elected, consider himself the special representative of country chemists. Without disputing the truthfulness of the *ipse dixit*, it may be permitted me to ask what support the assertion has in the nature of things; what connection is there between a professorial chair in the metropolis and the business of a country chemist. The address proposes to take measures "to stop the unauthorized practice of dispensing medicines, selling poisons, patent medicines, etc., by co-operative societies and other unqualified bodies." So far as the illegal compounding of medicines and vending of poisons is concerned, it simply means the action which the Society has endeavoured to take for some time, and which time has not "now arrived"; but as to the sale of patent medicines, does the professional gentleman propose that chemists should take the responsibility of them ?. and if not, if the liability is to be thrown back upon the proprietors ? Wherein do chemists differ from the grocer or huckster who may deal in them ? and what advantage to the public—the sole ground for legislation—will accrue from any proposed restrictions?

But these matters may be left in other hands. I desire rather to call attention to the omissions of the address. From such a quarter I should have expected a word on the education of young men, some utterance on "cram." I have heard of a trainer of assistant chemists, who professed to teach Latin by giving only the nominative and genitive cases of nouns, as that was "all that is necessary." When I was first introduced to the trade, the last 'London Pharmacopœia' was just out. I wonder how a student in those days would have managed the directions of the chemical compounds, or the descriptions of the materia medica, with only two cases. Is the present age so deteriorated ? I look upon the palming off of such teaching as worse than the quackest of medicines or the lowest price at co-operative stores, and I marvel that nothing has been said on this point, which is too notorious to be overlooked. Further, I think it highly undesirable that persons engaged in training candidates for examination should have anything to do, however remote, with the appointment of examiners, and therefore I not only decline to give the requested support, but think it right also to draw the attention of chemists generally to the subject.

April 15, 1878. A COUNTRY CHEMIST.

NOT ONLY PATENT MEDICINES, BUT ALSO GENERAL PHARMACY IS COMING TO GRIEF!

Sir,—Please allow me space through the medium of your pages to state my utter repugnance at the present fearfully injurious low price system, having read with interest in your valuable Journal the free discussion of several correspondents upon the subject, and fully approve of many statements knowing that they are too true.

Shortly after this nineteenth century had risen out of her "teens," I ventured my lot amongst the C's and D's, and after a long and hard apprenticeship of seven years in a country town I emerged into London, and about that time chemists were springing up like mushrooms, but never was the business so degraded and such a rush of ruinous competitions carried out in almost all quarters as it is at the present day. And I beg to add that not only our patent medicine trade suffers from the village grocers, drapers, and advertising tailors, co-operative stores, and a host of other "dabblers" in medicines, but the whole of our legitimate dealings are now curtailed to the utmost extreme, even by (the worst of them all) pharmaceutical and other qualified chemists by examination calling themselves co-operative drugs companies, who are fiercely "clipping" (especially in our county) this our respectable business into shreds, barely allowing a grocer's margin of profit, who may be supposed to return their five to ten thousand sterling per annum. Can there possibly be no remedy for this monstrous malady, which is spreading so widely all round us thick and fast?

I have read that once upon a time "a mouse could release a lion from its snare." Let us registered chemists under the Pharmacy Act of 1868 rise up ourselves—unity is strength—and lawfully agitate, petition, and strive altogether against this cruel monopoly. Might against right! for so it meaneth. The man who happens to have the most cash or falls in with a rich wife, says "Here goes in for a dash! I intend to make all the trade my own," while his smaller neighbour and brother tradesmen may starve.

But where is this ingenious mouse is to be found? Well, I think and hope that something could be broached amongst our affluent brethren to alleviate, or even to release us poor little hard strugglers from the very heavy pressure which these evil doings are at the present time causing. Have not the chemists of Plymouth and surrounding towns, Birmingham, Liverpool, and other large towns, done some good by combination and societies, and why should not Brighton, a very large town and neighbourhood, do the like? Pray let some attempt be made by the parent society, or by some C's and D's society, to save us from these suicidal prices, namely, for 1*s*. 1½*d*. articles, sold at 7½*d*., 8½*d*., 9½., 10½.; 2*s*. 9*d*. articles at 2*s*. 3*d*., and 2*s*. 6*d*. articles for 2*s*., 1*s*. 9*d*., etc., and for drugs, perfumery, pomades, and sundries, at proportionate low charges, and prescriptions dispensed at 50 per cent. below the usual table or list of prices. There can be no defence at these ridiculous figures, and they are advertised in this locality almost daily.

April 15, 1878. SUSSEX.

P.S.—I now hold in my hand a circular from a candidate for my vote at the approaching election for the Council of the Pharmaceutical Society, who says: "You may rely upon my best endeavours to further in every way the interests of pharmacy, especially with reference to the retail trade." This the man I would support.

J. B.—We do not know; but the date of becoming a member is placed against each name in the list in the Society's Calendar, and such names might be counted.

W. J. W.—Glycerole of subacetate of lead is prepared by substituting glycerine for water in the official liquor plumbi subacetatis, using the heat of an oil-bath to effect solution, and filtering while hot. The method of operating is described in a paper by Mr. Balmanno Squire, published in the *Pharmaceutical Journal* for May 6, 1876. The product is diluted with pure glycerine to the strength required.

J. S.—No; except as a trustee.

"*Radix*" is recommended to address his question to the Registrar.

"*Preliminary*."—We should think not; but if you think there has been any irregularity you are advised to communicate with the Secretary, 17, Bloomsbury Square.

"*Aberdonia*."—It would require a stamp if recommended in any way for the relief of disease, or put forward as an occult or proprietary preparation.

R. F. Smith.—The lectures should have our careful consideration if we were furnished with a report and the lecturer's permission to publish them.

"*Nepos*."—*Ruscus aculeatus*.

N. Lincoln.—The following has been recommended by a correspondent:—Iodine and iodide of potassium, of each, ʒss; hydrochloric acid, ʒj; water to Cj. M.

"*Incog*."—Novargent is prepared from recently precipitated chloride of silver by dissolving it in a solution of either hypophosphite of sodium or cyanide of potassium.

W. H.—You will find the information you require in Cooley's 'Cyclopædia of Practical Receipts,' a new edition of which useful work is now being issued in monthly numbers by Messrs. Churchill.

"*Occidens*."—(1) We cannot say the exact number, but the British species are certainly under 700. (2) We do not know. (3) The question shall receive attention.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Smith, Mr. Hallor, Mr. Stowell, Professor Flückiger, Mr. Burn, Mr. Morris, Mr. Reynolds, Mr. Williams, Dr. Lewis, Mr. Mudie, S. J. T. M., A. E. J., A. G., Glycerinum.

"THE MONTH."

Notwithstanding the cold weather experienced during the early part of April, flowers have made such rapid progress that the botanical list for this month is quite as long as the one for the same date last year. The woods are already gay with anemones, primroses, bluebells, and the delicate blossoms of the wood sorrel and wild cherry, while other welcome harbingers of spring, the golden saxifrage, the handsome marsh marigold, the pretty cuckoo flower or ladies' smock, and the favourite cowslip, are everywhere brightening the damp pasture with the profusion of their blossoms.

The *Daphne Laureola* may still be found in blossom in chalky woods. It is very curious with regard to the berries of this plant that they are said to be poisonous to all animals except birds, which are very fond of them. Some of our spring flowers are perhaps worthy of more notice than they generally receive. Thus the marsh marigold (*Caltha palustris*) will be seen upon examination to have its petaloid sepals folded in such a manner as to answer the purpose of both calyx and corolla, for while three sepals overlap only at one edge, and fulfil the duty of a corolla, the two outer sepals overlap the others at both edges so as to cover the lines of junction of the other three, and thus effectually protect the pollen from moisture. Darwin quotes Lecoq's statement that sometimes specimens of this plant are found with only staminate flowers. We have never been fortunate enough to meet with such specimens. An infusion of the flowers was formerly used for fits, this use having arisen, according to Withering, from the fact that a large quantity of the plant having been placed in the bedroom of a girl afflicted with fits, the fits afterwards ceased.

The pretty little moschatel, which may here and there be met with on shady banks in lanes and woods especially on a sandy soil, is well worth examination. The small head of flowers consists of five flowers, of which the four lateral flowers usually have five parts, and the top flower only four parts. The two stamens are alternate with each petal, and the anthers are one-celled only, hence each of these stamens is regarded by some botanists as consisting of a single anther lobe, separated from its fellow by a long forked connective. The white coral-like rhizome, with its abortive scale-like leaves and slender stolons proceeding from their axils, are also worth notice. The plant is also interesting on account of the difficulty in finding out the exact position it should occupy. Although possessing somewhat the habit of a saxifragaceous plant, it was formerly placed in the ivy family, and now it is placed in the *Caprifoliaceæ*.

The cuckoo flower was used in the time of Ray for hysteria and epilepsy, and is recommended by Withering for worms. It may be profitable, as showing the progress made in medicine and pharmacy during the last century, to recall the fact that it is little more than one hundred years ago that Sir G. Baker read a paper before the Royal College of Physicians, on the use of the flowers, in which it is stated that the flowers should be toasted on pewter dishes over a fire, powdered, and the powder boiled in bottles covered and *stopped with leather, and on no account with a cork.*

The elegant little wood sorrel (*Oxalis Acetoseall*), to which oxalic acid and salts of sorrel owe their names, is worth examining, as it is one of the plants producing cleistogamous flowers; these may be recognized by looking like buds, and having short stalks bent downwards. In these flowers the upper stamens are on a level with the stigma, and the petals are minute. According to Darwin, these produce a few more seeds than the open flowers. This is one of the plants which claims the honour of being the Irish shamrock.

The dark blue flowers of the *Anemone Pulsatilla* may now be looked for in chalky districts in the eastern countries, as near Hitchin and Cambridge. Although when in blossom it is conspicuous only from the size of the flower, the flower stalk being very short, yet after flowering the stalk lengthens very considerably, and the head of long tailed achens forms a very conspicuous object. The juice was formerly used for paralysis, and the plant is now much valued by homœopaths as a remedy in various female disorders. Its name of Pasque flower is said to have been given to it by Gerarde on account of its flowering at Easter-tide.

At the Kew Gardens, several medicinal plants are now in blossom. In the economic house may be seen the ipecacuanha plant with its condensed cymes of small white flowers just coming into blossom. The Maltese orange and the capsicum present both flowers and fruits. The lime (*Citrus Limetta*) and the cinnamon are in bud, and the West Indian ipecacuanha (*Asclepias curassavica*) is in full flower.

In the open ground the American mandrake, or may apple (*Podophyllum peltatum*) is now just unfolding its leaves and flower buds. In this state it presents a curious appearance, the leaves being folded closely around the leaf stalk so that they look like little closed umbrellas. *Jeffersonia diphylla* is now in full foliage, the flowers being over, and the kidney-shaped leaves form a striking object. *Sanguinaria canadensis*, with its pretty white flowers, and the rosemary may be seen in blossom in front of the No. 2 museum. The leaves of the former on the slightest touch exude drops of fluid of a much more blood-red colour than that of the celandine; indeed, so close is the resemblance that a drop of the juice on the hand might easily be mistaken for blood. The caraway also is in full blossom in the umbelliferous bed, and we are glad to see in the same locality a healthy young plant of the sumbul, carefully tended. In one of the hothouses may be seen a splendid plant of the *Datura sanguinea* of Peru, covered with its handsome orange-red flowers, each of which is about six inches long, and wide enough to admit a full-sized finger. Those who are interested in British plants, may find the following rare plants in blossom:—*Muscari racemosum, Euphorbia hiberna* and *E. pilosa, Fritillaria Meleagris*, and Solomon's Seal. Among less rare plants now in flower may be seen *Geum rivale, Myrrhis odorata*, and *Smyrnium olusatrum*, all of which formerly had their medicinal uses.

Students of botany will be glad to learn that in future there will be no difficulty in obtaining admission to these magnificent gardens before 1 o'clock. The *Gardeners' Chronicle* for April 20th, p. 500, publishes an authoritative statement to the effect that "all persons visiting the gardens for study and improvement of whatever kind may in future, on calling at the Curator's office, signing their names and stating the object of their visit in a book kept for the purpose, enter the garden by the office gate."

For the benefit of those who may not know where the Curator's office is, we may state that it will be found a few doors to the left of the main entrance on the Kew Bridge side of the gardens. Dr. Hooker's letter, which is well worth reading by all who think that the gardens should be opened to the general public at 10 a.m., is published in full. The advantage likely to be taken of such a concession has already been manifested by applications which have been made to the Office of Works for permission to erect in the gardens a photographic establishment and a shooting gallery!

Some interesting remarks on the leaf of *Conium maculatum* formed the substance of a paper recently read before the Linnean Society by Mr. J. Gorham. From observations which he had made it was shown that in a piece of the leaf, one-third of an inch long by one-fifth wide, the veinlets were arranged in exactly the same way as the venation of the entire leaf. This was found to occur in the other umbelliferous plants which were examined, so that it was possible to detect and recognize each from the merest fragment. This is something like describing an animal from a bone. These facts open a new field to students of botany, besides promising to be of valuable service in medico-legal investigation. The relation of the venation of leaves to the branching of a tree may yield more interesting facts upon investigation.

In Edinburgh Botanical Gardens we learn, through the kindness of Professor Balfour, the following medicinal plants are now in blossom:—*Ipecacuanha*, *Asarum Europœum*, *Sanguinaria canadensis*, *Sarracenia purpurea*, *Jeffersonia diphylla*, *Quassia amara*, *Coptis trifoliata* and *Symplocarpus fœtidus*. The curious Californian pitcher plant (*Darlingtonia californica*) is also in blossom. Those who have the opportunity of visiting these gardens should not forget to look at the curious blossoms of *Mantisia saltatoria*, a zingiberaceous plant which derives its generic name from the singular resemblance of the flowers of some of the genus to the mantis insect; the specific name saltatoria is derived from the fanciful resemblance of the flower of this species to a ballet dancer, whence the popular name of "Dancing Girls" is applied to this flower. The curious flowers of *Musœnda frondosa* are also worth examining. Some of the flowers of this cinchonaceous plant produce a white leaf-like sepal, which is remarkable for having several veins converging towards the top of the sepal, instead of the pinnate venation of the leaves, for which reason it is sometimes regarded as a modification of the petiole rather than of the lamina of a leaf.

The present month is perhaps the best time of the year to study the Trilliaceæ, several species of which are now in blossom in the various botanical gardens, as well the curious Herb Paris (*Paris quadrifolia*), which may now be found in blossom in damp woods in several of the Eastern counties. This plant is remarkable for having the parts of the flower in multiples of four, and net-veined leaves, although it is a monocotyledon. The rhizome, which has a pleasant nutty flavour, is said to be poisonous.

From the annual report of the Botanical Gardens at Calcutta, we learn that the Para rubber and vanilla will not flourish there, but that it is intended to try the former in Burmah, and that seedling plants are being now grown for exportation to Burmah. The cultivation of ipecacuanha, although still continued, does not seem likely to be carried on to any great extent.

The crop of the cinchona plantation at Sikkim during 1876–7, according to the Government report, appears to have been a very good one, amounting to 207,782 lbs., and consisting of 201,455 lbs. of dried red bark, and 6326 of yellow and pale bark.

It is intended to discontinue the process of mossing the bark at Sikkim for the future, it not being applicable to that locality.

During the last year 406,600 more plants of red bark were planted.

It may be hoped that the valuable Calisaya of Santa Fé, which has recently been brought to this country, will be tried both at Sikkim and in the Nilghiris,—although the latter district is more likely to prove favourable,—this species having the remarkable property of producing a large quantity of quinine in its young shoots, and being thus most valuable for coppicing.

The operation of stopping or filling teeth is attended with so much discomfort that any improvement of practical value must be a great boon to the suffering public. Dr. Weil, of Munich, has recently advocated the method of first extracting the tooth, filling it and then replacing it. The tooth is only kept out of the socket for one or two hours and the results are said to be excellent, as the teeth so treated ultimately become firmly fixed and can be freely used. It is said to be applicable both to bicuspids and molars. As to whether the replacing of the filled tooth causes much pain no information is given.

Chinese materia medica is well known to include many curious substances, but the following paragraph, extracted from *Nature* will show that the list of curiosities in medicine is by no means exhausted:—"Dr. F. Wong gives us some curious particulars respecting a strange remedial agent used in China for Cynanche tonsillaris. The remedy in question is called How-tsao and is apparently a soft stone not unlike a biliary calculus. It is said to come from Siam, and is worth twenty times its weight of silver. Twenty or thirty grains of this taken in water is thought to be very efficacious, and Dr. Wong mentions having seen a case where this remedy was given and certainly appeared effective after gargles and astringents had been applied in vain. The way in which the structure of the remedy is accounted for is very curious. The story goes that when a monkey is wounded, it picks out the proper medicinal herbs, masticates and applies them to the wound, so that successive layers are in this way laid on so as to form a mass. In time the wound heals, and the lump of dried herbs falls off; it is then picked up by the Siamese and sent in small quantities to China as a drug." From the brief description of the character of this curious remedy it seems probable that it is a biliary calculus like the oriental bezoar. If its properties are found to have a basis in facts, it would be worth while to examine How-tsao for ellagic acid, which is one of the principal constituents of oriental bezoar; the medicinal properties of this acid might perhaps be worth examination.

In France an attempt has recently been made to revive the old reputation of the purple loosestrife (*Lythrum Salicaria*), as an astringent in diarrhœa and all diseases which require a mucilaginous astringent. The infusion is made in the proportion of 30 or 40 parts of the leaves to 1000 of water; the decoction with 30 to 60 parts to 1000 of water. The decoction is used for injections, etc. The powdered leaves are applied to atonic ulcers.

The poisonous properties of the yew tree appear to have attracted the attention of various correspondents of the *Gardeners' Chronicle.* The present number contains a note from Mr. W. Robins, of Slough, who notices the curious fact that the deer crop freely the yew and laurel, but will not touch the rhododendron.

In 'Medicinal Plants' for this month, the following are described and figured, *Garcinia Indica*, *Citrus Bergamia*, *Butea frondosa*, *Carum ajowan*, *Pinus Tæda*, *Pinus balsamea*, and *Alpinia officinarum.* The first is perhaps better known under the name of *Garcinea purpurea*, and is the plant from which "kokum butter" is obtained. The authors state that 'Pharmacographia' errs in describing the embyro as having thick inseparable cotyledons, the fact being that the seed consists almost entirely of a thickened radicle, at the apex of which is a slight depression indicating the plumule, the cotyledons being entirely absent. *Alpinia officinarum*, the source of the galangal root of commerce, has not been figured before. Although many of the plants which have been figured from time to time in 'Medicinal Plants' have been figured elsewhere, yet it is only in works which are by no means easily accessible, except to the dwellers in large cities, and hence this work should form a standard work with every pharmaceutist.

Amongst recently introduced preparations may be mentioned one that is now being advertised in the American journals as "Ingluvin, from the Ventriculus Callosus Gallinaceus; superior in all cases to pepsin from the hog." This substance is prepared from the gizzard of the domestic fowl, and is described by Dr. Shelley, of Philadelphia, and Professor Wallace, of Jefferson Medical College, as a specific for vomiting in pregnancy. It is also said to be a powerful and reliable remedy for indigestion, dyspepsia, and in all cases where pepsine or pancreatine is usually employed, but to give more certain results. This would appear to open up a new field for experiment, and already there has been announced an analogous preparation from the stomach of the ostrich!

It will be remembered that Berthelot prepared a number of extremely interesting conjugated compounds by the reaction of fatty and other acids upon certain sugar-like principles. Thus from mannite and stearic acid he obtained tetrastearomannide and hexastearomannide, bodies resolvable into mannitane and stearic acid by boiling with dilute acids. Again he prepared a number of so called saccharides and glucosides; for instance, by the following reaction, $C_6H_{12}O_6 + 2C_4H_8O_2 = C_{14}H_{22}O_7 + 3\,H_2O$, he obtained butyric glucose.

Recently L. Prunier* has obtained similar compounds from quercite and butyric and acetic acids. The substance termed by him monobutyrin decomposes as follows under hydrating influences:—

$$C_6H_{10}O_4(C_4H_8O_2) + H_2O = \underset{\text{Quercite.}}{C_6H_{12}O_5} + \underset{\text{Butyric Acid.}}{C_4H_8O_2}.$$

Tributyrin is similarly affected:—

$$C_6H_6O_2(C_4H_8O_2)_3 + H_2O = C_6H_{12}O_5 + 3\,C_4H_8O_2.$$

So also is pentabutyrin, $C_6H_2(C_4H_8O_2)_5$. Prunier also prepared the corresponding acetins in a similar manner, namely, by heating quercite with the acid in sealed tubes at about 110° to 112° for twelve hours.

* *Compt. Rend.*, lxxxiv, 1318.

C. Reischauer* has analysed a substance ("nucin") prepared from the green shells of walnuts (*Juglans regia*), and assigns to it the formula $C_{36}H_{12}O_{10}$. It is soluble in alcohol, and forms a copper compound, which is of a bronze colour and is crystalline. Its composition is not yet worked out.

From determinations of the vapour density of cantharadin, J. Piccard† gives to this substance the formula $C_{10}H_{12}O_4$. Its vapour density is about 6·5 and its fusing point 218°. Under the influence of hydriodic acid it forms a derivative of identical ultimate composition with cantharadin, but differing in its properties. Its constitution has not been thoroughly established by the author, who terms it cantharic acid, forming salts of the general formula $C_{10}H_{11}O_3OR$.

It has been recently suggested,‡ by Mr. Thomas Douglas, that gas lime could be utilized for the production of ferrocyanides. He arrived at this conclusion from an experiment in which he mixed gas lime with 5 per cent. of carbonate of sodium, extracted with water, and evaporated the solution to dryness. The dry extract when mixed with iron filings, and heated in a covered crucible, seems to produce ferrocyanide of sodium. If this process for utilizing the sulphocyanates in gas lime could be carried out commercially, it would incidently free the gas lime from at least a part of its sulphur compounds.

In a paper§ read before the Society of Public Analysts, Mr. A. Wynter Blyth explains certain discrepancies exhibited in the analyses of milk made by different analysts, as due to a decomposition of its albuminous constituents with the production of fats. In this way, a milk analysed at two different periods would yield different amounts of fat on analysis, and thus the proportion of the other constituents would be distorted. The author quotes an old memoir of Blondeau in confirmation of his results. M. Blondeau showed that Roquefort cheese when kept undergoes certain changes, which are initially attributed to mycoderms; these changes result in the production of fat, so that a sample of cheese, containing originally 1·85 per cent. of fat, showed after keeping two months as much as 32·30 per cent. of fat, with a corresponding diminution in the amount of caseine, viz., from 81·03 per cent. to 43·28 per cent. This subject is interesting, and in view of our slight knowledge regarding the chemical constitution of albuminous substances, and recent attempts to elucidate their structure, deserves more complete study.

The discovery of sulphocyanides in saliva is due to Tiedemann and Gmelin, and some time afterwards Leared found indications of their presence in urine and other liquids. These observations were confirmed by Gschleiden (in 1870), who estimated the sulphycyanic acid in urine at about 0·0225 grm. per litre. It is somewhat startling in face of these facts to find the *Medical Record* of to-day referring to Gschleiden's observations as recent ones. Our contemporary has, moreover, corrupted his name to Gschleidew, and points out that Munk arrived at the same results independently. It is more to the point to observe that recently Thudichum || seems to have disproved every statement made by Gschleiden,

* *Deut. Chem. Ges. Ber.*, x, 1542–1548.
† *Deut. Chem. Ges. Ber.*, x, 1504–1506.
‡ *Chemical News*, March 29, 1878.
§ *The Analyst*, April, 1878.
|| 'Pathology of the Urine,' p. 300.

who relied upon reactions of sulphocyanic acid which are by no means peculiar to that body.

In the *Quarterly Journal of Science*, for April, there is contained a most interesting article on the "Economy of Nitrogen," in which the anonymous author describes the various sources of certain elements either of great use to mankind in a commercial sense or essential to his subsistence by entering into the composition of foods. He then enters into the question of "waste," as, for instance, of phosphorus in the use of matches, and of nitrogen in gunpowder, and adduces strong evidence to show that our stores of these materials will presumably in the future, distant though that may be, run short. Many of the forms which waste products take are so far removed from the original and available forms that, in spite of the indestructibility of matter, our supplies may be cut off through mere lack of time (if not for any other reason) required to transmute waste substances into available sources. The author, after warning of these and other matters, concludes as follows :—"Meantime, to economize nitrogen, phosphorus and potash, to recover these bodies from waste, and to find substitutes for their present profligate applications, is the most sacred task which the chemist can take in hand. The reforms which may shield us from occasional pestilence sink into insignificance compared with those required to guard posterity, in a not very remote future, from chronic scarcity, from recurrent famine, and from a wolfish struggle for food, in which man must relapse into a worse savagery than that from which he has emerged."

Our consolation is that, before to-day, supplies of certain materials have been cut short, and yet man's ingenuity and chemical knowledge have yielded new sources. When during the French Revolution nitre could not be got for love or money, men extracted the common earth under their door-steps with water in order to obtain the small but widely distributed quantities thus available; and when a monopoly of the sulphur trade was granted to a house in Marseilles, technology found pyrites to be a suitable material; moreover nearly two hundred patents were secured in the meantime to obtain sulphur from gypsum.

The *Brewers' Guardian* is reprinting a translation and abridgment of Dr. Lintner's article on the Manufacture of Beer, from Hofmann's 'Reports on the Recent Development of Chemical Industries,' and the following table showing the production of beer and the consumption per head is taken from this article. The table refers to the year 1872 :—

	Production of Beer in Litres.	Consumption per Head in Litres.
Bavaria	920,700,000	219
Wurtemberg	280,100,000	154
Belgium	700,000,000	145
Great Britain and Ireland	3,568,200,000	118
Saxony	154,500,000	60·5
Baden	41,900,000	56
Alsace Lorraine	83,600,000	51
Other German States	200,300,000	48·5
Prussia	972,200,000	39·5
Holland	135,600,000	37
Austrian Hungary	1,221,200,000	34·5
Sweden and Norway	77,300,000	27
North America	998,200,000	26
France	700,000,000	19·5
Russia	974,000,000	14

It is so common now-a-days to write and think of beer as a mere alcoholic solution, produced by the fermentation of sugar, that some very important matters are nearly left out of consideration. Beer not only contains alcohol and certain other comparatively simple ingredients, but it likewise contains a mass of extractives of the nature of which chemists are as ignorant as they are of the extractives derived from muscular tissue or meat, and it is really a question how far the substances comprised in this list take part in producing the effects which collectively are termed drunkenness. If anyone takes the trouble to free beer from alcohol by distillation, it will be found that although the residual solution is not nearly so pleasant to the taste, it is, when consumed, still capable of producing extraordinary effects on the human system. That these effects are due to the presence of alkaloidal or other matters there can be little doubt, and when it is remembered what powerful influences certain alkaloids exert in the human body, it is still further surprising that scientific enterprise should not extend to the elucidation of these interesting and important matters. That alkaloidal principles do exist in beer is beyond question, and if anyone doubts this statement a simple experiment will remove the doubt and substitute conviction in its place. The experiment referred to consists in the precipitation of beer by means of a solution of phospho-molybdic acid acidified with nitric acid. There are some persons who cannot drink a single glass of mild ale in the day without feeling certain effects—giddiness and so on—which are ordinarily comprised in the phenomenon of intoxication, and it would be absurd to suppose these effects due only to the small percentage of alcohol that is contained in the beer. It thus arises that in all probability there may be produced a most intoxicating beer quite free from alcohol.

But to pass from the consideration of beer to that of another and equally favourite beverage, namely, tea.

Professor Sewell, of Quebec, has recently made a communication to the Surgical Society of Ireland, in which he states that green tea counteracts the poisoning effects of opium. There are many points, however, requiring confirmation and explanation upon this subject, and Dr. Cameron, of Dublin, has undertaken some experiments to better decide them.

The *Medical Press and Circular* (April 10) calls attention to a disease to which sorters of alpaca, camel-hair, and mohair are exposed. This disease, known as "sorters' disease," oftentimes proves fatal to persons without the exhibition of any previous distinguishing symptoms; that is to say, it acts so suddenly at times that men who are apparently in good health in the morning are dead by evening of the same day. It seems to be a preventible disease, resembling septicæmia in some respects, although its precise nature and cause are unknown. If the cause were known, then the *Medical Press* believes that chemistry might assist by submitting the fleeces to some agent which would destroy the poison without injuring their texture or value.

Before taking up the thread of the "Dispensing Memoranda" it may be as well just to refer to the suggestions of some correspondents with reference to one or two prescriptions which received the usual notice in last month's summary. One of the prescriptions referred to (No. 72) was composed of calomel, Dover's powder and bismuth with oil of caraway, and for these ingredients a good excipient was required to form a satisfactory pill; more than one correspondent recommended ext. gent. for this purpose. A little reflection must convince a dispenser that a medicinal extract of the Pharmacopœia, like that of gentian, is inadmissible as an excipient, except in those cases where it may be specially ordered by the writer. If made use of in the prescription just referred to, the patient in taking the pills would be very likely to detect the presence of a bitter that had no place in the prescription, more especially if the pills had been previously prepared with a more suitable excipient. Glycerine of tragacanth may be used, and to its use there can be no objection.

Again, in the carbolic acid and lead lotion with rose water (No. 91) it is remarkable that so many correspondents should have overlooked the necessary formation of carbolate of lead, and have attributed the deposit to carbonic acid present in the rose water. One or two experiments would have determined this point, and it is to be regretted that this course is not more frequently adopted in the presence of a difficulty such as the one in question.

Several replies have been received with reference to Lister's boracic acid ointment (No. 80), and an acknowledgment is due for the practical suggestions contained in them. It was an error to conclude that the principle generally applicable to compounds of this nature, that of solution of the salt, is practicable in this case. The boracic acid must be rubbed very fine and then stirred into the other ingredients previously melted together. From the observations of hospital dispensers on this preparation, perhaps the formula may be considered somewhat of a spécialité in hospital practice.

The glycerole of belladonna also has elicited several replies, and in almost every instance hospital formulæ have been quoted. The object in view in these memoranda columns is rather to shadow forth certain principles that shall assist in guiding a dispenser placed in a responsible position, and in presence of a difficulty, than to issue an unalterable "fiat" that shall assume the character of a dogma. In this instance it is perfectly possible that the glycerole of belladonna, made in accordance with any one of these hospital formulæ, may be a more active and efficient preparation, but in case of inconvenience from an undue absorption of belladonna, the dispenser of the prescription would be in a better position if he had made the glycerole of belladonna in strength corresponding to a formula having official sanction than any other, especially stronger, used in hospital practice, and probably under special circumstances.

The first question for consideration is that of No. 92, Where "magnesia" is prescribed, what preparation of magnesia should be used? On reference to the Pharmacopœia it will be seen that there is only one magnesia, made by calcining carbonate of magnesia, the other is magnesia levis, made by calcining light carbonate of magnesia; this differs from the preceding preparation only in its greater levity.

The prescription No. 93 contains equal parts ext. cinch. liq. and aqua with pot. iodid. The bark is said to separate and stick to the sides of the bottle, violent shaking having no effect upon it. The pot. iodid. should be dissolved in the water and the bark added gradually with repeated shaking. There is a flocculent separation, but this is readily diffused and does not adhere to any extent, or with appreciable tenacity, to the sides of the bottle. There is no necessity for the addition of mucilage; after moderate shaking there will be no difficulty in dividing the doses. Cinchona bark contains very little resin, and the fluid extract being an aqueous preparation a separation of resin as suggested by a correspondent would scarcely be expected.

The inquiry No. 94 is not definitely stated, and this makes a satisfactory reply the more difficult. It would have been better to have sent a copy of the prescription, or to have stated how much carbolic acid was required in each pill. The reply of one correspondent, recommending soap and powdered liquorice root, may be a sufficient answer, if only one drop be required in each pill, but a more satisfactory result will be obtained by using two grains of bread crumb to each grain of crystallized carbolic acid. A correct copy of the prescription should be sent where practicable, as it places correspondents in a better position for replying, and the suggestions offered will generally be the more valuable.

The tinct. sap. virid. co. (No. 95) may be a preparation of soft soap, but it may also be an ingredient in one of those obscure prescriptions which are occasionally met with straying from the special establishment to which they were directed. This one apparently hails from New York, and, if a resident there, may be a representative of elegant pharmacy. It is not quite clear if, as one correspondent has suggested, it is merely a solution of green soap in spirit, why it is called a compound tincture; and further, it is scarcely probable that the bichloride of mercury would be combined with tincture of soap. Neither can it be tr. verat. vir. Most probably it owes its origin to some private formula.

In reply to the question No. 96, relating to oleate of mercury with morphia, correspondents have furnished very detailed replies to which nothing further need be added. It is a satisfactory feature in connection with the "Dispensing Memoranda" that the various questions are being so fully answered by correspondents as on many subjects to leave little for remark in the month's review.

Indefinite preparations are now and then, and probably always will be, met with in prescriptions. A case in point is that of No. 97, where sol. taraxaci is prescribed, there being no official form for this preparation. It may mean succus taraxaci or a solution of the extract, and is very likely a preparation of the latter kept for convenience in dispensing by some practitioner who makes up his own prescriptions. If the dispenser is unable to refer to the writer he would be on the safe side in using the official succus taraxaci; but it must be admitted that the sol. taraxaci is not *evidently* the same as liq. taraxaci, as has been suggested by a correspondent. It may be a preparation of the extract introduced to some members of the profession and made proprietary by certain establishments.

The answer to No. 98 must be sought for in the locality whence the prescription emanated. Lin. opii post Bowes, may be an illegitimate offspring, resulting from the union of the prescriber and the chemist, to which the general name of "bastard forms" would be applicable. "Bow's Liniment" is a preparation enjoying a certain amount of popularity, formulæ for which will be found in the numbers of this Journal for Feb. 19, March 1, and March 8, 1876. The orthography of the name is, however, different. The dispenser in this instance must use his discretion, and in case of any inconvenience or disappointment resulting from the employment of lin. opii, B.P., in lieu of lin. opii post Bowes, the writer will be more to blame than the dispenser of the prescription.

It is very difficult to give a definite reply to query No. 99. For sulphate of quinine to crystallize out of tinct. quinæ is unusual if it be made according to the B.P. and the directions for dissolving the quinine be attended to. The cause must be looked for in some imperfect manipulation, provided that the several ingredients were of the proper quality and strength.

The creasote ♏j in each pill, as in No. 100, may be satisfactorily combined by using bread crumb in the proportion of two grains to each minim of creasote. Should the bread crumb be crumbly a little glycerine of tragacanth will give it a pilular consistence. These pills may be almost immediately silvered.

Aq. menthæ referred to in No. 101 is mint water, the product of *Mentha viridis.* Mint water was formerly more frequently met with in prescriptions than is the case at the present time. Sowerby says "the peppermint was not introduced as a medicinal plant until the beginning of the last century, the green mint being usually preferred by the older physicians." Mint water is still a favourite with some members of the medical profession; at the same time it is just probable that in this instance the writer may have intended Aq. Menth. Pip., but the dispenser without positive knowledge to this effect has no alternative, he must use the Aq. Menth. Viridis.

NOTES ON A FEW AMERICAN DRUGS.*

BY JOHN M. MAISCH.

Pterocaulon pycnostachyum, Ell.—An imperfect specimen of the subterraneous portion of this plant was received from Georgia, where it is known as *Blackroot,* and enjoys some local reputation as a valuable alterative. The plant belongs to the natural order Compositæ, has a nearly simple stem, with decurrent lanceolate wavy-margined leaves, which are smooth above and densely tomentose beneath. The inflorescence is spicate, the imbricated involucral scales are deciduous, the ray florets are white, and the achenes are crowded with a long hairy pappus. The plant grows in the damp pine barrens of the Southern States, from North Carolina to Florida.

The portion used is the rhizome, which is horizontal or oblique in the ground, and when viewed from above has a compact but knotty and somewhat contorted appearance. Its most striking peculiarity is that on the lower side it divides into a number of closely-set tuberous branches, which are nearly perpendicular and somewhat conical, grow to the length of about an inch, and are then suddenly contracted, each into one thin, wiry rootlet of about one to two inches. The rhizome has a thin bark, which is externally of a black colour, internally of a greyish brown, and adheres but loosely to the tough wood, which is greyish or blackish brown, and divided into numerous very narrow wedges, loosely connected by the shrunken, narrow medullary rays from which the tangential surface, after the removal of the bark, assumes a lace-like appearance. The rootlets have a similar character, only the bark is relatively thicker. The recent rhizome branches, from which over-ground stems had grown, are scarcely one-quarter inch in diameter, but on their lower surface show already the disposition of sending off the perpendicular, cylindric-conical branches described, and as the latter increase in size the stem bases become almost obsolete, and are reduced to mere scars, more or less concave. The entire rhizome is inodorous, and the wood tasteless, while the bark has a slightly acrid and peculiar bitterish taste.

"Blackroot" resembles in colour the rhizomes of *Cimicifuga racemosa* and *Leptandra virginica,* both of which are easily distinguished from it by the total absence of the perpendicular tuberous branches, and more particularly the former, by its stout ascending rhizome branches and the cross-shaped disposition of the meditullium of its rootlets; and the latter by the horizontal branches of the rhizome, its hard wood and rather large pentagonal or hexagonal central pith.

In regard to its medicinal properties, Dr. F. P. Porcher ('Resources of the Southern Fields and Forests,' p. 460) says that much use is made of it as an alterative, and that it is supposed to be possessed of decided value; also, that it is well known as the blackroot of the negroes, and is given in the form of decoction (how strong?) several times a day. Nothing is known of its chemical constituents.

Ledum latifolium, Ait.—About nine months ago specimens from a shrubby plant were received from Michigan, in the northern part of which State the Indians claim for it great healing virtues, it being regarded to possess soporific and cathartic properties, and externally used as a sovereign remedy in fevers, sores, bruises and rheumatism. The dry fruit capsules still attached to the plant made it not difficult to recognize it as a member of the Ericaceæ, and the above mentioned species of Ledum. Subsequently, the same plant was received from Canada, with the statement that it was popularly used to some extent and considered a valuable medicine; its supposed properties, however, were not mentioned.

The plant is known by the name of James Tea and Labrador Tea, and occurs in British North America, and in the United States, from New England to Wisconsin and southward to the mountains of Pennsylvania. It occurs in cold bogs and damp woods, grows to the height of 2 to 5 feet, and has alternate leaves about one inch in length, somewhat aromatic when bruised, elliptical or oblong, with an entire somewhat revolute margin, dark-green and shining above, whitish beneath, and covered with a rusty wool. The small white flowers have five or sometimes six stamens, and are in umbels situated at the end of the branches; lateral branchlets with a smooth bark, growing from the base of the umbel. The fruit forms a five-celled capsule, which splits from the base upwards, and contains many minute seeds.

In Redwood's 'Supplement to the Pharmacopœia,' it is stated that the leaves are used for tea, and when infused in beer render it unusually heady, producing headache, nausea, and even delirium, but they have, nevertheless, been used, it is said, in tertian agues, dysentery and diarrhœa.

This little shrub is very similar to the *Ledum palustre,* Lin., which is indigenous to Northern Asia, Eastern and Northern and some parts of Central Europe, and likewise to British America. It differs from the former mainly by its linear-lanceolate leaves, the ten stamens of its flowers and its more oval capsules. It was formerly known as *Rosmarinus sylvestris,* but the leaves are readily distinguished from the rosemary leaves by the dense, rusty, felt-like hairs on the lower surface. The young and fresh leaves have an agreeable aroma and a bitter and astringent taste; the old and dry leaves are less aromatic. They have been employed in intermittent and other fevers, in cutaneous diseases, croup and other complaints.

L. latifolium has been analysed by Bacon, but I have not been able to consult his essay. The other species has been repeatedly examined. The most complete, though now not satisfactory, analysis is by Meissner ('Berl. Jahrb.,' xiii., p. 170), in which, besides the more generally distributed principles, he found notable quantities of

* From the *American Journal of Pharmacy,* February, 1878.

tannin and 1·5 per cent. of volatile oil. Rauchfuss (1796) had previously obtained 3 per cent. of volatile oil. G. W. Grassmann (1831) noticed for the first time the stearoptene, which he obtained to the extent of nearly seven-tenths per cent. of the weight of the fresh plant, and which L. A. Buchner subsequently (1857) subjected to elementary analysis, and found to be a hydrate of a terpene agreeing with the formula $5C_{10}H_{16}.3H_2O$. Willigk also examined the volatile oil, and besides the stearoptene, determined it to consist mostly of a hydrocarbon of the same composition as turpentine. Grassmann's ledum camphor volatilizes readily, its vapour producing headache and vertigo.

It is not improbable that our indigenous species may contain similar principles, and, aside from the volatile oil, may possess the tonic, somewhat astringent and diuretic properties of the leaves of other Ericaceæ.

Dioscorea villosa, Lin.—This is the only representative in the United States of the natural order Dioscoreaceæ, and is known by the name of *wild yam*. A number of species of the same genus occur in the East and West Indies, the most important of which are *Dioscorea alata*, Lin.; the white negro yam, *D. triphylla*, Lin.; the buck yam, *D. trifida*, Lin., or Indian yam, *D. bulbifera*, Lin., the Ceylon white yam and several others comprised in *D. sativa* of Linnæus. They are generally cultivated in tropical countries for their tubers, which attain a considerable size, weighing frequently thirty to forty pounds, and, though quite acrid in their fresh state, are cooked and used as food. They contain starch as their valuable constituent, which appears generally to be about 15 to 18 per cent. of the weight of the fresh tuber, but may occasionally reach 24 per cent., according to Sheir (1847), or according to Grouven (1856) fall to 8 per cent.

The rhizome of the indigenous species has a very different appearance.

The wild yam occurs throughout the United States from New England southward to Florida and westward to the Mississippi, and is quite common in the southern section. It grows in thickets in moist localities, its slender herbaceous stems running over bushes and attaining a length of 10 to 15 feet and more. The plant is diœcious, the greenish staminate flowers are in paniculate hanging bunches, the pistillate flowers in simple drooping racemes. The leaves are quite variable, frequently alternate, but sometimes opposite or even in whorls of four to six; the latter appears to occur oftener in the South. The leaves are broadly ovate, with a heart-shaped base, entire or wavy at the margin, conspicuously pointed, with nine to eleven ribs, nearly smooth above and more or less downy but never villous beneath. The fruit forms a triangular capsule, which is conspicuously winged on the angles, and the pendulous bunches of which are quite striking and make the plant easy to identify.

The rhizome is horizontal, about one half inch in diameter, somewhat flattened from above, repeatedly forked or branched in various directions, so that the entire rhizome covers a space six to twelve inches in diameter, the branches bearing a slight resemblance to ginger. Upon the upper surface at irregular distances are the circular, more or less concave scars, left by the overground stems; beneath and on the sides, at a distance of about half an inch, are the simple wiry rootlets about two to four inches long. Rhizome and rootlets are of a light or yellowish-brown colour, and break with some difficulty, exhibiting a compact white tissue with numerous scattered wood bundles of a yellowish colour. Odour is absent; the taste, at first insipid, soon becomes strongly acrid.

It is regarded to possess antispasmodic, diaphoretic, expectorant and emetic properties, and has, among other complaints, been recommended in bilious colic in the form of an infusion, made with one ounce to the pint, one half being taken at a dose. In Virginia, and probably in other States, it is known among the negroes as *rheumatism-root*, it being considered a sure cure in that complaint.

Continued boiling impairs the acrid properties of wild yam, the principle being either volatilized or altered by heat; it has not been investigated. The rhizome contains also a considerable proportion of starch.

COMPOUNDS OF SALICYLIC ACID WITH ALBUMINOIDS.*

BY FR. FARSKY.

The author has prepared compounds of egg-albumin, casein, fibrin, and syntonin with salicylic acid by several methods. Either the albuminoid and the acid were mixed together and allowed to stand with constant stirring, or the two were combined in a dialyser, or the vapour of the acid was made to act on the finely powdered substance. Whichever method of preparation was adopted, the solid substance was finally extracted by pure ether, which was shaken up with it as long as the filtrate gave a reaction with ferric salts. The albumin-compound was then washed with hot water, and dried in an air-bath at 120—130°.

Analyses showed that on the average 14·16 per cent. of salicylic acid was combined with 85·84 per cent. of the albuminoid, which points to the formula $C_{72}H_{112}N_{18}SO_{22} + 2C_7H_6O_3$. These compounds are found to be quite as easily digestible as the uncombined albuminoids, so that salicylic acid might possibly be used for the preservation of feeding-stuffs.

In connection with the above researches the author has been enabled to make a more accurate investigation of salicylic acid, and he gives the following account of it. It crystallizes from concentrated solutions in slender, almost colourless needles, from dilute solutions in larger prismatic, very hard crystals, often very prettily grouped. If, however, other bodies are present in the solution, and more especially if they are organic bodies, regular crystals are not formed, but, according to the nature and quantity of the admixed body, either crescent-shaped, annular, or tufted forms which scarcely resemble crystals, are obtained.

When the foreign body is removed the acid gradually regains the capability of forming acicular crystals. Freezing the solution also brings about the change. The acid melts at 157·5°, and sublimes at 200°, but even at 80° a considerable quantity volatilizes. Perfectly pure crystals may be obtained by heating a solid body containing the acid, or a solution of the acid, at this temperature in the air- or water-bath. The acid, as is well known, splits up on boiling into carbon dioxide and phenyl-alcohol; but it is quite sufficient to heat the solution of the acid or certain salts, especially in presence of other acids, for a long time on the water-bath, to bring about this change. Hydrated sulphuric acid decomposes salicylic acid only when it is added all at once to the solid acid or its solution.

Permanganate of potassium, especially in presence of sulphuric acid, oxidizes salicylic acid, and among other products of the decomposition are found formic and carbonic acids and water. A similar decomposition is effected by boiling the acid with potassium bichromate and sulphuric acid. If the solution of the acid is heated with the bichromate without addition of sulphuric acid, a body passes over with the steam which has an unpleasant odour; it has not been examined. When salicylic acid is brought into contact with ferric acetate, it combines with the iron, the liquid becomes of a violet colour, and deposits a dirty violet precipitate of $Fe_2H_2O_4$.

This hydrate dissolves in water and forms a golden-yellow liquid, which can be concentrated, but is decomposed by contact with acids, bases, salts, alcohol, ether, and even filter-paper, and rendered insoluble. If, however, the solution of the ferric salt is tolerably concentrated, and especially if the mixed solution is not too acid, a brown salicylate separates out. The acid behaves in a

* *Chem. Centr.*, 1877, 148. From the *Journal of the Chemical Society*, March, 1878.

similar way to lead acetate; lead salicylate is formed, and very strong vapours of acetic acid are evolved in the cold.

Salicylic acid forms three salts with ferric oxide, a normal salt, a basic salt, and a so-called ferric ferro-salicylate.

Compare the author's paper on the "Application of these salts to acidimetry and alkalimetry" (*Wien. Sitzungsber*, lxxiv, 49).

MUSTARD.*

Mustard was, according to the belief of the ancients, first introduced from Egypt, that country which claims the honour of being the birthplace of Ceres, the goddess of seeds, and Æsculapius, the god of medicine, through whose means this plant was made known to mankind as an agreeable and wholesome herb in its green state; while the seed was used as a medicine, and occupied the first rank among alimentary substances which exercised a prompt influence on the brain. Mustard is mentioned by Pythagoras, and was employed in medicine by Hippocrates, B.C. 480. Pliny states that there were three kinds of mustard cultivated in his day; the first of a thin and slender form, the second with a leaf like that of the rape, and the third with that like the rocket. The best seed, he says, was imported from Egypt, but that this plant grew in Italy without sowing. The Romans made great use of the seed in medicine; the oil extracted from it, mixed with olive oil, was used by those who suffered with stiffness of their limbs after a cold bath. Pounded with vinegar it was employed as a liniment for the sting of serpents and scorpions, and a dose of it effectually neutralized the poisonous properties of fungi. The Romans, and other nations after them, used to ferment mustard-seed in new wine, which converted it into a kind of inferior brandy, and was known by the name of *Mustum ardens*, burning wine.

The mustard seed mentioned in the Scripture has of late years been a matter of considerable controversy, some authors supposing it to be quite a different plant from the one we are now treating of; but it is generally believed by the best authorities in the present day that the plant referred to was *Sinapis nigra*, the common mustard, which is indigenous to Palestine, as it is to Britain. Dr. Thompson, in his 'Land and the Book,' records that he has seen this plant as tall as the horse and his rider in the rich plains of Acre.

"As small as a grain of mustard seed," appears to have been a proverbial expression for any small object among the Jews; and this seed, which was the smallest the husbandman was accustomed to sow, produced the largest results by becoming the greatest of the husbandman's herbs.

We have no record when mustard was first used in this country, but in the household accounts of the thirteenth and fourteenth centuries we find that mustard was known to our forefathers under the name of "Senapum," and appears to have been used in large quantities, for in that interesting Household Book of the Earl of Northumberland, in the reign of Henry VII., it is stated that 160 gallons of mustard-seed was the allowance per annum to his servants and retainers. In those days the seed was not manufactured, but brought to table whole, when it was bruised and mixed with vinegar, according to the taste of the eater. It was not only used as a condiment, but also, no doubt, for medicinal purposes. Tusser, who wrote his 'Five Hundred Points of Good Husbandry" in the reign of Queen Mary, says in the direction for February—

"Where banks be amended or newly upcast,
Sow mustard-seed after a shower be past."

From this it appears that mustard was cultivated as a field crop; we also find it mentioned as an agricultural produce in Rogers's 'History of Agriculture and Prices in England,'' as far back as 1285. It must then have been *S. nigra*, black mustard, or *S. arvensis*, the charlock, for Gerarde tells us that the garden mustard, which produces the whitest of seeds, had not become common in the days of Queen Elizabeth, but that he had distributed the seed into different parts of England to make it known. He says, "Mustard makes an excellent sauce, good to be eaten with gross meats, either fish or flesh, because it promotes digestion and sharpens the appetite." Thomas Cogan, M.D., of Manchester, who published his 'Haven of Health' in 1605, says, "The force of the seed is well perceived by eating mustard, for if it is good in making to weep we are straightway taken by the nose and provoked to sneeze, which plainly declareth that it soon pierceth the brain. Wherefore as it is a good sauce and procureth appetite, so it is profitable for the pulse, and for such students as be heavy-headed and drowsy, as if they would fall asleep with meat in their mouths. And if any be given to music, and would fain have clear voices, let them take mustard-seed in powder, work the same with honey into little balls, of which they must swallow one or two down every morning fasting, and in a short time they shall have very clear voices." Shakspere mentions mustard as a condiment in his play, "Taming the Shrew," act iv., scene 3, where *Grumio* says to *Katharina*, "What say you to a piece of beef and mustard?" It is also mentioned in his play "As You Like It,'' in connection with pancakes (act i., scene 2). In Evelyn's time, Tewkesbury was famous for its mustard. The seed, Coles tells us, in 1657, used to be ground there and made up into balls, which were brought to London and other remote places as being the best the world affords. Mustard used formerly to be largely cultivated and manufactured in the county of Durham; but until the year 1720 the seed used to be pounded in a mortar and coarsely separated from the black integuments of the seeds, and in that rough state prepared for use. About the year mentioned an old woman of the name of Clements, resident at Durham, conceived the idea of grinding the seed in a mill, and to pass the meal through the several processes which are resorted to in making flour from wheat. The secret she kept for many years to herself, and in the period of her exclusive possession of it supplied the principal parts of the kingdom, and in particular the metropolis, with this article; and George I. stamped it with fashion by his approval. Mrs. Clements used to travel twice a year to London for orders, and was able to pick up a small fortune. From this woman's residence at Durham, it acquired the name of "Durham mustard" (*Mechanics' Magazine*, vol. iv., p. 87). The seeds of *Sinapis arvensis*, charlock, and *Raphanus raphanistrum*, the wild radish common in our cornfields, are often sold and used as a substitute for mustard-seed. The seed of the black mustard, like that of the wild sort, and also of the wild radish, if sown below the depth of three or four inches, will remain in the ground for ages without germinating: hence when once introduced it is difficult to extirpate. Whenever they throw the earth out of their ditches in the Isle of Ely, the banks come up thick with mustard, and the seeds falling into the water and sinking to the bottom will remain embalmed in the mud for ages without vegetation (Loudon's 'Encyclopædia of Agriculture').

Sinapis alba appears to be a native of the more southern countries of Europe and Western Asia. It is now cultivated not only as a garden herb, but is grown very largely as an agricultural crop, chiefly as food for sheep or to be ploughed in for manure in its green state. Mustard is extensively cultivated in the Fen lands of Lincolnshire and Cambridge, also in Essex and Kent. Its medicinal properties are well known; in its action it is an irritant, stimulant, emetic, and stomachic.

Some authors think *Sinapis* is derived from *sino* to hurt, and *opis* the eyes, from the pungency of the plant causing the eyes to water; others from the Celtic *nvp* (modern

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* From *Science Gossip*, April, 1878.

Gaelic *neup*) a turnip, which belongs to this tribe. Our word "mustard" is derived from the French *moutarde*, but in early times it was, both here and on the Continent, *sauve* or *seneré*. Some authors assert that the etymology of this plant was changed from the following circumstance. In 1382 Philip the Bold, Duke of Burgundy, was marching against his rebellious subjects of Ghent, and the city of Dijon, which traded largely in *seneré*, supplied him with a thousand men-at-arms, for which service the duke granted that city many privileges, amongst others that of bearing his arms, with his motto "*Moult me tarde*" in old French (I long or wish ardently), which was carved on the principal gate of Dijon. By some accident the middle word was destroyed; the other two, *moult tarde*, caused many a smile at the expense of the citizens, and in derision the *seneré* in which they traded was called *moutarde*, a name it has preserved ever since.

IODIDE OF ETHYL, OR HYDRIODIC ETHER.*

A communication made recently to the Academy of Medicine by M. G. Sée has directed attention to the iodide of ethyl or hydriodic ether, a body of which the therapeutic action has not hitherto been much studied. In 1850 M. Huette briefly indicated the advantages attending its use as an inhalation in phthisical dyspnœa, but M. Sée has extended the inquiry in a different direction and finds that in asthma inhalations of iodide of ethyl produce most remarkable effects.

Iodide of ethyl was discovered in 1825 by Gay-Lussac; and is represented by the formula C_2H_5I. It is a colourless liquid, having a very strong peculiar ethereal odour and a sp. gr. of about 1·95; it commences to boil about 72° C., and inflames with difficulty. It decomposes slowly in contact with air and more quickly under the influence of sunlight, becoming coloured through iodine set free.

In preparing iodide of ethyl according to Wurtz's method 25 parts of alcohol are introduced together with 7 parts of phosphorus into a flask; to the neck of the flask is fitted a prolongation nearly filled with iodine and coarse fragments of glass; the orifice of the prolongation is closed by a cork, through which passes one end of a glass tube, the remainder of which after a slight curve is enveloped in a Liebig's condenser. The flask is heated in a water-bath and upon distillation of the alcohol the vapour after condensation flows back into the prolongation where it dissolves iodine before falling into the flask. There under the influence of the iodine and the phosphorus the alcohol is decomposed, iodide of ethyl being formed and an oxygen compound of phosphorus. When the whole of the iodine has been dissolved, indicated by the condensed liquor falling into the bottle colourless, the operation is stopped and the product in the flask separated from any excess of phosphorus for purification. The precautions necessary during the operation are to regulate the heat so as to produce a gentle ebullition and to use a relatively capacious vessel.

M. Personne substitutes amorphous for ordinary phosphorus, using 30 parts of phosphorus, 120 parts of absolute alcohol and 100 parts of iodine. The phosphorus and alcohol are placed first in a tubulated retort, next the iodine in two successive portions at a minute's interval; the mixture is then distilled and condensed. In this way, according to Personne, a kilogram of hydriodic ether may be obtained without danger in less than an hour.

Prepared by either method the product requires to be purified before use in medicine. This is done by redistilling it over a water-bath, shaking the distillate with water and then with an alkaline solution, dehydrating it over calcium chloride, and submitting it to a final rectification.

At present iodide of ethyl is only administered in inhalations, 6 to 10 drops being used six or eight times a day against attacks of asthma.

* *Repertoire de Pharmacie*, vol. vi., p. 97.

SAPO VIRIDIS.*

BY HERMAN BETZ.

This preparation is used to some extent in Europe, and many pharmacists here are obliged to keep it for their customers, who make use of it in itch and allied affections, for which it is by some considered quite an efficacious remedy.

As found in the market, it is often very impure, being prepared from common animal fats and coloured with various substances. Animal fats are not advisable for this purpose, but any vegetable fatty oil, such as oil of hemp or linseed can be very properly used. In countries where oil of hempseed is a common article of commerce, green soap is usually made from this oil, and is obtained of a nice dark green colour.

One reason why green soap in this country is so often adulterated may be found in the scarcity and high price of oil of hempseed. Oil of linseed has the same properties in making a soap for the purpose before mentioned, and on account of its cheapness would not offer so much temptation for adulteration; it would be advisable to use it altogether, when we would always have a uniform and reliable preparation. As it is now, one can hardly find two samples alike.

In making green soap, one or two points have to be taken into consideration. In the first place the colour; this green colour is one of the most difficult to obtain from vegetables. I have made a number of experiments, and found none to answer so well as the green colouring matter precipitated from a solution of indigo by lime.

Another point is the disagreeable odour which green soap usually has, but this is easily overcome by a few drops of essential oil, for instance, the oil of citronella.

The following formula may be found useful in preparing the soap:—

Take of Oil of Linseed, U. S. P.,
Solution of Potassa . . . . āā Oi.
Colouring Matter . . . . . q. s.
Oil of Citronella . . . . . gtts. x.

Place the oil and potassa in a porcelain dish; mix thoroughly and boil with a regulated heat until the mass becomes thick or stringy; then add the colouring matter and the oil of citronella, with constant stirring.

If the oil is perfectly saponified the mass must be homogeneous and transparent; opaqueness may be due to want of water, or to an excess of fat, or of solution of potassa. The first and the last can be remedied by a small quantity of water, and if the proportion of oil was too large, an addition of solution of potassa will render the mixture clear.

ATROPIA AND DATURIA†.

A. Poehl has investigated the cause of the well-known and generally acknowledged difference in the medicinal activity of commercial atropia and its salts, which Hager has been inclined to attribute to the presence of another alkaloid, probably belladonnia. The supposed chemical identity of atropia and daturia, asserted by Planta, has led to the practice of preparing atropia not only from the roots and leaves of belladonna, but, likewise, from the leaves and seeds of stramonium. Poehl has recently again examined the two alkaloids prepared by himself and found the following differences:—

Atropia is optically inactive, but daturia turns polarized light to the left, its specific rotating power being 14·12°. Atropia salts are precipitated by platinic chloride, but daturia salts are not affected by the same reagent. Atropia salts are not precipitated by picric acid, which, however, precipitates daturia salts. The two alkaloids are therefore chemically not identical, and the difference in the physiological action of commercial atropia is doubtless due to the absence or presence, in larger or smaller proportion, of daturia.

* Read at an Alumni meeting of the Philadelphia College of Pharmacy, and published in the *Amer. Journ. Pharm.*

† *American Journal of Pharmacy* from *Petersb. Med. Wochenschr.*, 1877, No. 20.

SULPHATE OF COPPER IN BREAD-MAKING.

My Dear Editor,—I do not know whether the subject to which I wish to call your attention for an instant will appear to you to merit notice in the columns of the *Pharmaceutical Journal*, as in point of fact it is not a pharmaceutical or a chemical question, but because of its importance it appears to me that it is one worthy of a place in any publication occupied with the interests of humanity, and I hope that specially the journals of pharmacy, medicine, and hygiene will spare a corner for the discussion of a question which has hitherto been unfortunately too much localized. I refer to the toxic action of copper and the use of copper salts in bread-making.

It is some considerable time since experiments on this subject were commenced in Germany, and during the last three or four years they have continued with almost a feverish activity in France, but the opinions based upon them have not been at all concordant. On the one hand, Galippe and his school maintain that the compounds of copper are not poisons; on the other, their antagonists, Feltz, Ritter, and others maintain that these same compounds are not without danger, and that animals have been killed by administering to them salts of copper.

In a discussion which has recently taken place at a meeting of the Medical Society of Ghent two of the members expressed diametrically opposite opinions. A memoir "Sur les falsifications du Pain," had been presented to the Society by Dr. De Ridder, in which the author had insisted specially upon the employment by our bakers of sulphate of copper.

A propos of this, Dr. Dumoulin, resting on a host of results obtained by different experimenters, ranged himself upon the side of Galippe, and alleged that the use of sulphate of copper in bread-making is completely inoffensive, and that the time had come for the modification of the law respecting the adulteration of alimentary substances. Not only, said he, is sulphate of copper when introduced into bread incapable of doing injury to human health, but it allows of the production of a bread which is finer, better, and more agreeable to the consumer, whilst effecting an important economy. He considered that the introduction of a suitable quantity of this salt constituted a progress in the art of bread-making, which affected political and domestic economy in the highest degree, and which in the interests of these two sciences should be realized, because sulphate of copper rendered possible the making of good bread from inferior flour.

Dr. Morel refuted these assertions of Dr. Dumoulin at some length. He argued that supposing even sulphate of copper is not a poison, it is nevertheless true that this salt when introduced into the economy in doses of twenty centigrams, causes nausea, vomiting, colic, and diarrhœa, though these pass away in about twenty-four hours, and are followed by a return to health. Dr. Dumoulin did not deny this action of sulphate of copper in such doses. Dr. Morel therefore considered it more than probable that doses of one-half or one-fourth of this quantity would produce symptoms of which the intensity would be equal to one-half or one-fourth the intensity of those produced by the dose of twenty centigrams. Not only did this appear to him evident *à priori*, but he also raised in the discussion one of the most important chapters in therapeutics, that which relates to idiosyncrasies. Dr. Morel even borrowed some of his facts from the professorial course delivered by Dr. Dumoulin himself in the University of Ghent; such, for instance, as the small quantities of camphor which frequently induce syncope, the occasional emetic action of manna, and the different action which mercury and chloroform have upon different persons.

These examples seem more than sufficient to prove that too much prudence cannot be exercised in the ingestion of substances that do not form a constituent part of the body; at any rate it has not yet been proved that copper is indispensable to the human economy. During the discussion in Ghent mention was made of the experiments of Kuhlmann, which showed that sulphate of copper added to bread in the proportion of fifteen to thirty-three milligrams per kilogram, gives to the product —especially if the flour be of inferior quality—a much finer appearance, and augments its apparent value. If the proportion of fifteen to thirty-three milligrams per kilogram be exceeded the bread loses instead of gains in its physical properties. These proportions, according to the partisans of the innocuousness of the salts of copper, are to be recommended on every ground, since in some maladies they are even beneficial as a medicine.

As will be seen the question is one of capital importance. As was argued by Dr. Morel, supposing even that idiosyncrasies do not exist, that chemical poisoning by copper had never taken place, that the salts of copper were not toxic, and might be introduced into the body with impunity, nevertheless the introduction of sulphate of copper into bread is reprehensible. In fact, since good flour never requires such an addition in order to yield good bread, and since the use of such an agent can only be favourable to the use of inferior flours, having a low nutritive power, it follows that the addition of sulphate of copper to bread ought to be considered an adulteration.

The greater part of the inferior flours are characterized by a low proportion of the essential nitrogenous constituent known under the name of gluten. Bread made with the addition of a little sulphate of copper also contains more water, experiments having shown that this excess amounts to 6 per cent. It is not therefore without reason that Dr. Morel maintains with Millon, that "the degree of the hydration of bread should be the first point regulated by the legislator." A baker who gives a weight of water in the place of a weight of bread always strikes at the purse of the consumer, and when the consumer is poor and does not eat bread in proportion to his appetite, he strikes at both his purse and his health. Five per cent. of water in the bread every day represents at the end of a year a deficiency of eighteen days' food, and converts for the unhappy workman a year of abundance into a year of privation. According to Dr. Morel the addition of sulphate of copper constitutes a triple fraud:—(1) because the sulphate of copper is not a harmless substance; (2) because this salt augments the proportion of water in the bread; (3) because it is employed in the utilization of low class flours inferior in nutritive power to those of good quality.

My dear Editor, you have here a faithful *résumé* of a debate which is of considerable importance in its relation to the public health, and I hope the readers of the Journal will be pleased to have the subject brought before them, for I think it is one that should interest them. In my eyes its importance is so great that too much publicity could not be given to the facts. I look upon it even as a duty for all those who occupy themselves with hygiene to take part in the debate, and they will, in my opinion, render a great service to humanity by availing themselves of the columns of the scientific journals to make known the opinions they hold upon the subject under discussion.

Yours very truly, GHENT.

The Pharmaceutical Journal.

SATURDAY, APRIL 27, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

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LIGHTING BY ELECTRICITY.

MANY years have now passed away since FARADAY'S experiments revealed the possibility of electricity becoming at some time applicable as a source of light. Whether this could be economically and usefully done was, however, for a long time, and indeed is still, a moot point. Thus it has been contended that the elaborate and expensive machinery necessary in the production of the electric light placed it at a disadvantage as compared with the more easily produced light from coal gas or oil. Moreover, when the electric light was produced it was not without its disadvantages, one being its intermittent character, and another, the dazzling brightness of the beam, which is very disagreeable in its effect upon the eyes. Some of these difficulties have been more or less overcome by persevering and ingenious workers, notably by M. GRAMME, and dwellers in the metropolis have now abundant opportunity of admiring the beauty of the light given by his machine from the Clock Tower at Westminster during the time Parliament is sitting. The electric light has also been used advantageously in the carrying on of various out-door operations in this country and on the continent. In Paris, amongst other places, it is used in lighting the Exposition Buildings as well as the Chapelle-Paris goods depôt, the Place de l'Opéra, and the courtyard of the Hôtel de Louvre, whilst in the celebrated chocolate factories of M. MENIER, we are told that no less than fourteen machines are now employed, and these are so arranged that the electric light can be supplied also to the drawing and dining rooms, conservatories, and gardens of the residence.

An interesting contribution to the history of the subject of electric lighting has been made by Dr. PAGET HIGGS, in a paper recently read before the Chemical Section of the Society of Arts, which we hope to reproduce in an early number of this Journal. It consisted principally of a description of a modification of the SIEMEN'S magneto-electric machine, which is at present employed by Messrs. SIEMENS Brothers in one of the departments of their telegraph works. This machine is said to do there the work before only imperfectly done by one hundred and twenty gas lights, and at a cost calculated at one half. Dr. HIGGS'S figures, however, did not pass unchallenged, and certainly they appear to have been favourably put. For instance, although it was stated that one and a half or two horse-power at least was necessary in order to drive one machine, only a sum for coals was charged, on the ground that in Messrs. SIEMENS'S establishment there is always such an excess of steam power that it was not practically noticeable whether the machine was connected with the shafting or not. This may be the case, but it cannot be assumed to be a normal state of affairs in every establishment. Nevertheless, Dr. HIGGS'S sharpest critic willingly acknowledged the enormous advance that has been made, since the machine for producing a light equal to one thousand candles can now be obtained for about £35, whilst a short time ago it would have cost ten times as much.

During the discussion that followed the reading of the paper, several interesting points were touched upon. In answer to an objection that whereas in the gas manufacture the operation of storing gas went on in the day time, whilst it was assumed that in the case of the electric light it would be necessary to have machinery equal to the current production of the maximum quantity of light required at any particular time, Dr. HIGGS said that though at the present time it was not the practice to store up force for electricity, there was no reason why it should not be done, or why engines working a certain number of hours per day should not store up force just as it was done in hydraulic machines. In order to overcome the unpleasant glare of the electric light opal and milk-glass globes have been used, and it has been found that even in shaded lamps electricity gives a light six times more intense than that of gas, though the effect of looking at the lamp is still unpleasant. It has also been proposed to place the electric focus in a reflector and to project the rays upon a whitened ceiling or another reflector placed so as to diffuse and soften the light. One great advantage that the electric light possesses is that it allows of a discrimination between colours that is not practicable by the aid of gas, and this has been turned to good account in silk mills, making it possible to distinguish readily between a bluish green and a greenish blue by artificial light. When the electric light was introduced into these establishments the workmen during the first two or three hours always wasted time in looking at the light and thus got dazzled, but after the novelty had worn off it was found that not only could the task of examining the silk be better performed with the aid of the stronger light, but that the work did not fatigue the eyes so much.

It would thus appear that although much yet remains to be done before the electric light can replace gas and oil lamps in the household, if indeed it ever does, it is already in a fair way of receiving an extensive application in our large manufacturing establishments.

ALLEGED POISONOUS VIOLET POWDER.

In the *Lancet* for the 20th inst. there appeared a letter bearing the signature of a firm of "analysts," which contains one of those unsatisfactory charges that ought either to be supported by fuller details or not to be made at all. After some preliminary remarks about a "sad epidemic" among young children in the neighbourhood of London, in which the disease presents the appearance of erysipelas and ends sometimes with the death of the child, the letter goes on to state that in a case where a child was similarly attacked some violet powder was suspected to be the cause. A packet was therefore sent for analysis to the writers of the letter, who returned a certificate that it contained 25 *per cent. of white arsenic*, and communicated this result to the *Lancet*, with the remark that "These poor children, then, have suffered and died from arsenical poisoning." Not the slightest indication is given, however, as to the seller or manufacturer of the violet powder.

Incredible as such a statement appears to be, we should not be justified in challenging its correctness in the absence of fuller information, and we notice that in the editorial column it is stated that the subject is under "official investigation." It is to be hoped that the result of the investigation will be speedily published; indeed it is not quite clear why, if the facts are as stated, sufficient has not been elicited since the 12th inst., the date of the letter, to warrant a prosecution under the Arsenic Act, if not on the graver charge of manslaughter. But we do protest against such an accusation being hurled indefinitely against a large body of tradesmen, with the almost diabolical insinuation that because white arsenic is cheaper than starch it is used by them, reckless of consequences, as a substitute in the preparation of violet powder. As our contemporary the *Lancet* has allowed itself to become the mouthpiece for making this sweeping charge, we think that it is bound at the earliest possible moment to withdraw it within the limits circumscribed by facts, if indeed it does not prove necessary to withdraw it altogether.

NOTE ON A NEW RHUBARB.

From a note by Professor Baillon in the Monthly Bulletin of the Linnean Society of Paris, we learn that M. Colin, pharmaceutical chemist at Verdun, the author of a creditable "Thèse" on Rhubarbs, received some time since (as stated by Professor Baillon in the 'Dict. Encyclop.,' 3, iv., 428), from Mgr. Chauveau, the plant which the latter considered to be the source of true Chinese rhubarb. This plant has now flowered, and from an examination of a specimen forwarded by M. Colin, Baillon is of opinion that the species is *R. hybridum*, of which, however, it must be considered a variety characterized by more elongated leaves that are also more acute at the apex and more irregularly cut at the margin. The flowers are small and white, often male, and constructed nearly as those of *R. hybridum.* A piece of the root presents the characters of a very good rhubarb, analogous to that of *R. officinale.* The author proposes to call the plant *R. hybridum*, var. *Colinianum.*

This further tends to corroborate the opinion already expressed by the author that the origin of the good kinds of Chinese rhubarb is multiple. Thus we have *R. hybridum Colinianum* and *R. officinale*, from the latter of which he has seen rhubarb of very good quality in Parisian commerce, whilst Prejevalsky states that *R. palmatum* undoubtedly affords the excellent rhubarb of Thibet. The author insists on the influence exercised on the quality of the drug by the method of collection, the season when this is made, probably also the process of drying, etc. He adds that it is also necessary to take into consideration the part of the plant which constitutes the drug, as this determines its histological characters. A rhubarb furnished by the stem or a part very close to the stem will differ from one obtained from the root. In *R. officinale*, for instance, where the aerial stem and its subterranean portion takes on a great development relatively to the root, he has found that the latter part may also acquire a considerable development, and that portions taken from it, and which would be naturally employed in commerce, present very considerable differences from those shown in the stem, and indeed have scarcely any of the characters there found, and considered essential in a rhubarb of the best quality.

THE PARIS EXHIBITION.

Since our last report on the condition of the Paris International Exposition considerable progress has been made in some of the departments, but though the time at which the Exposition was to be opened is now only a few days off, even the building, the grounds, and the arrangement of the objects exhibited are so far from being complete that in spite of the rapid advance in the work from day to day it seems scarcely possible that the Exposition can be thrown open to the public for some weeks. In many cases exhibitors have delayed sending in their goods until the last moment, and then the number of packages to be dealt with has become so large as to cause serious inconvenience. So backward are some of the courts that a rumour was current that the building would only be formally opened on the 1st of May, and that then it would be closed for some weeks until completed. If this be true it would be matter for great regret, as it would doubtless be productive of much inconvenience.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A General Meeting of this Association will be held on Wednesday, May 1, at the Quebec Institute, 28, Baker Street, W., at 8·30 p.m. The Annual Report will be submitted, new members enrolled and the Council for the ensuing session elected.

Transactions of the Pharmaceutical Society.

PHARMACEUTICAL MEETING.

Wednesday, April 17, 1878.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

A Special Evening Meeting of the Society was held, when a lecture was delivered by Professor BENTLEY on "Eucalyptus Globulus."

At the close of the lecture a cordial vote of thanks to the Lecturer was passed.

It is proposed to publish a report of the lecture in the next number of the Journal.

NORTH BRITISH BRANCH.

The sixth and last meeting of the present session was held in the Society's Rooms, 119A, George Street, Edinburgh, on the evening of the 19th instant. Mr. J. B. Stephenson, President of the Branch, in the chair.

The first paper read was by Mr. J. Falconer King, city analyst, on "The Disposal of Refuse from Certain Manufactories, in Relation to River Pollution." This paper will be printed in a future number.

Dr. William Craig followed with a paper on "Prescribing," which also will be printed in a future number.

The President then delivered the following Valedictory Address:—

Gentlemen,—In accordance with a time-honoured custom, I have now to go back over the subjects which have been brought before us at our varions meetings this session, but I purpose really little more than a bare enumeration of them. On the first evening, we had Dr. Stevenson Macadam, who gave us a highly interesting paper on the "Action of Paraffin Oils on Metals," as experienced in the storing of the oil for the lighthouses. Next evening, Dr. Andrew Wilson, favoured us with a capital address, in his own fine breezy manner, on the "Origin and Conditions of the Nervous System," and the same evening Mr. Howie kindly explained the working of the telephone, with practical illustrations. Our third meeting was held, through the kindness of Professor Archer, in the Industrial Museum, when he explained a new system of arranging the Vegetable Materia Medica of the British Pharmacopœia which he had just introduced there. At our next meeting Dr. Moinet read a valuable paper on the "Therapeutical Actions of Quinine," and on the last occasion on which we met Mr. Baildon, junior, gave us a singularly beautiful and able paper on "Botany in Relation of Modern Thought," being a continuation of a paper on the same subject which we had from him last session, and that same evening Mr. Ivison Macadam favoured us with some remarks of a very interesting character on Californian Wines. This evening our friends Mr. Falconer King and Dr. Craig have increased the obligation under which we already lay to them; the former by giving us the interesting paper to which we have just listened on the Disposal of Refuse from certain Manufactories, and the latter by his practical and suggestive remarks on Prescribing. In addition to all these, we have had various material contributions, books and specimens, etc., among which I cannot omit mentioning a stuffed musk deer, from Mr. Howden, of London, and a variety of quite unique specimens from our old friend Mr. Jamie, of Singapore. I am sure that at the last meeting of the session, you will authorize me to express our hearty appreciation of the kindness of each and all of our contributors and our lively gratitude for past favours as well as for favours to come. For obvious reasons, I cannot refer particularly to any of the contributions, but there is one paper which appears to me to occupy a place so peculiarly its own, that I think these objections do not apply to it. I mean the one by Mr. Baildon. And I feel that as the representative of the Society, I may be allowed on this occasion to compliment him on the rare ability displayed in it, as well as in his previous communications, and to thank him specially for them; and at the same to congratulate ourselves that such papers have emanated from one of our own members. And this brings me to the old grievance, the backwardness of our members in taking an active part in the proceedings on these occasions, for excepting Mr. Howie and Mr. Baildon all our contributors have been from without our own body. I do not think this is entirely creditable to us, and it is the less excusable that there is really no sufficient reason for it, for there are surely many of ourselves well competent both to interest and instruct us; and besides, however highly we may value papers on scientific subjects generally, (and I would be the last to undervalue them), it must never be forgotten that the communications most valuable to us, and therefore the most desirable, are those bearing directly on our own profession, either in some of its practical details, or its scientific aspects, or as co-related both to Art and Science, and that the requisite qualifications for doing full justice to such communications consist not so much in scientific attainments, as in practical observation and experience, which are obviously within reach of us all. Holding this view you will understand how I must continue to cherish the hope of better things in the future. Looking back on the session as a whole, you will see that we have had a goodly amount and variety of intellectual pabulum set before us, and the attendance on all occasions has been, I am gratified to say, very good. Our scientific meetings are designed and calculated to assist in effecting a most desirable object, viz., the diffusion of useful and scientific knowledge, and generally to raise the status as to culture and intelligence of the whole body, and in this respect they constitute a most important agency, gradual and imperceptible in operation yet not the less assured in results. It is from this point of view that I would urge their claims on our continued and increased countenance and support. And there is another consideration which is, I think, fitted to strengthen this appeal. I mean the privilege we enjoy of listening to the lectures *vivâ voce*, and the advantage we thereby possess over our brethren who can only read them in the Journal. And now, gentlemen, in conclusion, it is my pleasing duty again to thank you for the great honour you did me in placing me in this chair, and for the unvarying support and kindness I have received while occupying it, and you will all readily understand how my acknowledgments are specially due to our valued, or rather our invaluable Secretary, Mr. Mackay, and his indefatigable, ever obliging, never failing assistant, Mr. Stenhouse.

The Honorary Secretary announced the following donations:—

To the Museum.—Portrait of T. N. R. Morson, presented by his son; Working Model for preparing specimen cases for museum purposes, presented by Professor Archer; Bromide of Potassium, in fine crystals, by Geo. Atkinson and Co., London; Copper Precipitate, from the Tharsis Copper Company, by Mr. Kinninmont, Glasgow.

To the Library.—'Proceedings of the American Pharmaceutical Association,' for 1877, from the Association; 'Year-Book of Pharmacy,' for 1877, from the British Pharmaceutical Conference; 'The Pharmaceutical Register of Victoria,' from the Pharmacy Board of Victoria.

At the close of Mr. King's and Dr. Craig's papers, a short discussion took place, in which a few remarks were made by the President, Messrs. Young, Napier, and Mackay, and votes of thanks to the Lecturers were heartily responded to. The business of the session was brought to a close by a special vote of thanks to Mr. Stephenson, as President, for his able services during the session.

EXAMINATIONS IN EDINBURGH.

April 16, 1878.

Present—Messrs. Ainslie, Borland, Gilmour, Kemp, Kinninmont, Noble, Stephenson and Young.

Professor Maclagan was also present on behalf of the Privy Council.

MAJOR EXAMINATION.

One candidate was examined and declared qualified to be registered as a Pharmaceutical Chemist, viz.:—

Rohan, Robert Aldor ....Mauritius.

MINOR EXAMINATION.

Fourteen candidates were examined. *Six* failed. The following *eight* passed, and were declared qualified to be registered as Chemists and Druggists :—

Drummond, George ....Edinburgh.
Duckett, John James ....Preston.
Hutton, William ....Portobello.
Mair, Alexander ....Edinburgh.
Newsam, William Henry.........Otley.
Newton, George Robert ....Heckington.
Pryer, Henry.........................Chipping Norton.
Riddle, James Pearson............South Shields.

PRELIMINARY EXAMINATION.

The undermentioned certificate was received in lieu of the Society's Examination :—

Certificate of the Faculty of Physicians and Surgeons of Glasgow.

Houston, James ....Glasgow.

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The concluding meeting of the session was held in Anderson's College, on Wednesday evening, April 17. In the unavoidable absence of Mr. Daniel Frazer, President, Mr. J. M. Fairlie, Vice-President, occupied the chair. The minutes of the last meeting having been read and approved, James Christie, Esq., A.M., M.D., etc., was called upon and delivered a lecture on "Laws Regulating the Geographical Distribution of Epidemic Diseases."

The lecturer started by observing that epidemics may to some extent be likened to plants found in certain localities, and which when transplanted to another locality die a natural death or survive only under special circumstances. He next went on to notice the geographical limits of various epidemics, proving that these rarely extend beyond certain zones. He next dwelt on the cause of epidemics, and criticized very severely Dr. Lawson's "Pandemic Wave" and Dr. Byden's "Atmospheric Wave" theories. To illustrate his point Dr. Christie took up the East Africa cholera epidemics from 1821 till 1872, and came to the conclusion that such went directly against the two theories mentioned, especially Dr. Bryden's "Southern Aerial Epidemic Highway," and that the disease moved solely along the highways of human intercourse and in certain definite relations to that intercourse, and from facts stated, came to the following conclusions regarding the movements of epidemic cholera:—

(1) The generative agent of cholera is contained in the alimentary canal of a person suffering from the disease.

(2) The discharges (dejecta and ejecta) of a person suffering from the disease may produce, when swallowed, the same disease in others.

(3) The generative agent of cholera may find a fixed local focus of dissemination which may exist in activity for an indefinite length of time.

(4) The generative agent of cholera may be conveyed for short distances by currents of water, contaminated with discharges introduced in a fresh or dry state, or by currents of air.

(5) The generative agent of cholera may be conveyed for considerable distances by persons affected with the disease, during the period of incubation, and by articles to which discharges in the dried state may be attached, as tainted linen.

It follows from these conclusions that the progress of an epidemic may be arrested by the absence of local circumstances necessary to its propagation, and, in such a case, the disease would be said to have died out; it also follows that the disease may be arrested by sanitary and such other measures as may secure the absence of these local circumstances. Presuming that these conclusions be correct, the lecturer contended that a community can secure immunity by sanitary measures alone, and that these are simply such as ought to be adopted by every civilized community, and the adoption of such measures ought to be compulsory. From a tainted water supply and an impure atmosphere the health of the general population is deteriorated and organic diseases are produced, and this is the case not only in large centres of populations but also in country districts and even in detached houses. The lecturer concluded by observing that instead of regarding the outbreak of epidemics as special dispensations of Providence for the punishment of national sins, they are now coming to be regarded in their true light—*as but the inevitable results of living in a state of semi-barbarism;* and that epidemics, disastrous as they have been, have been productive of much good, and will continue to be so, for they have been effective monitors in regard to measures affecting public health.

After a few observations by Mr. Kinninmont and others, a very hearty vote of thanks was accorded the lecturer, who, on replying, presented the library with a copy of his work on 'Cholera Epidemics in East Africa.'

The annual general meeting was announced for Wednesday, May 1.

ABERDEEN SOCIETY OF CHEMISTS AND DRUGGISTS.

The annual meeting of the members of the Aberdeen Society of Chemists and Druggists was held in the rooms, St. Nicholas Lane, on Monday, April 15, Mr. G. P. Cruickshank (President) in the chair. The minutes of the former meeting were read and confirmed.

The Treasurer presented his annual report which showed that the sum of £16 3*s.* 3½*d.* stood to the credit of the Society. The income during the past year has been greater than for a number of years, except when special efforts had to be made to meet any extra expenditure for the support of classes, etc.

The following members were then elected office-bearers for the ensuing year :—President, Mr. David Ritchie; Vice-President, Mr. William Giles; Treasurer, Mr. James Paterson; Librarian, Mr. C. Coutts; Secretary, Mr. A. Strachan.

Mr. Mackay proposed that £5 sterling should be spent on books for the library. It was agreed that the young men should be asked to select suitable books and a committee elected to revise and report.

The 'Calendar of the Pharmaceutical Society' and the 'Year-Book of Pharmacy' have been received since last meeting, and on the motion of the Secretary a vote of thanks was passed and ordered to be transmitted to the various bodies.

The usual monthly lecture under the auspices of the Joint Association was delivered on Thursday, April 4, by Dr. James Moir, on "Phrenology." The chair was occupied by Mr. W. Giles (Librarian) who in a few sentences complimented the Joint Association on the success it had attained.

Dr. Moir then proceeded with his lecture, in which he gave a thorough exposition of the laws of phrenology, contrasting the various opinions of those skilled in the science of craniology. The lecture was amply illustrated with real specimens and casts of the human and lower species.

After a rather severe cross-examination by Mr. D. Ritchie, a hearty vote of thanks was accorded to the lecturer and the chairman.

The next lecture will be delivered on May 2 by Mr. A. Strachan, the subject being, "The Rise and Progress of Pharmacy and the Pharmaceutical Society."

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, April 18th. W. Crookes, F.R.S., Vice-President, in the chair. After the announcement of visitors, confirmation of minutes, etc., the following certificates were read for the first time: H. R. Smith and J. H. Wilson.

The first paper read was on—

"*Terpin and Terpinol.*" By W. A. Tilden, D.Sc. Terpinol is the name given by List to the liquid obtained by the action of dilute acids upon terpin hydrate. Conflicting statements as to its composition and properties have been given by Wiggers, List, and Oppenheim. The author's experiments lead him to conclusions which differ materially from those made by the above chemists, and he has brought this preliminary account before the Society, although the subject is by no means complete.

Crystallized Terpin, $C_{10}H_{20}O_2$, OH_2. —This compound was prepared by the process suggested by Wiggers. A mixture of one volume of nitric acid, one volume of methylated spirit, and two-and-a-half volumes of rectified turpentine oil, is allowed to stand about two days; it is then poured into a dish, after the addition of a small quantity of methylated spirit. Terpin is deposited in successive crops of crystals. No crystalline compound is obtained from the terpenes of the orange group; but the same compound is obtained whether American or French turpentine oil be used.

Action of dilute Hydrochloric Acid on Terpin.—To 53·5 grm. terpin, boiled up with 7–800 c.c. water, twelve drops of hydrochloric acid are added and the liquid distilled. An oily product, trepinol, distilled over between 205° and 215° unchanged. It has the formula $C_{10}H_{18}O$, and probable composition $C_{10}H_{18}\left\langle\begin{matrix}O\\O\end{matrix}\right\rangle C_{10}H_{18}$. It is a colourless, somewhat viscid liquid, sp. gr. at 16° ·9274; it has no action on polarized light. When dry hydrochloric acid gas is passed into it, its colour becomes purple, and ultimately a mass of crystals is formed, which by pressure can be obtained perfectly white. This new body has the composition $C_{10}H_{18}\left\{\begin{matrix}Cl\\Cl\end{matrix}\right.$ and is therefore the dihydrochloride. If an alcoholic solution of terpinol be acidified with nitric acid, and the mixture placed in a dish, crystals of terpin are deposited. From this and other considerations the author concludes that in the preparation of terpin by the ordinary process, terpinol is formed at a certain stage of the reaction. By the action of dilute sulphuric acid, 1 in 8, on terpin, and subsequent distillation in a current of steam, an oily product was obtained which analysis indicated as a mixture of a hydrocarbon $C_{10}H_{16}$ with terpinol. The crude product was therefore boiled for two or three hours with dilute sulphuric, 1 in 2, and distilled, finally from sodium; a liquid was thus obtained boiling at 176°-178°, vapour density 68·8, with the formula $C_{10}H_{16}$, sp. gr. at 15° ·8526. It is optically inactive, gives no crystalline deposit with hydrochloric acid, and no crystalline nitroso-compound. A dibromide was prepared. The author suggests the name "terpinylene" for this hydrocarbon, which resembles in many respects the hydrocarbon characteristic of Russian turpentine oil. The author has made a preliminary examination of the oxidation products of terpinol and terpinylene.

After some remarks by Dr. Armstrong, the thanks of the Society were given to Dr. Tilden for his valuable paper.

Dr. Armstrong then read a paper entitled—

The Poisonous Principle of Urechites suberecta. By J. J. Bowrey. The *Urechites suberecta* is a common wild plant in Jamaica, where it is called nightshade from its well-known deadly properties. Its dark green leaves and large bright yellow flowers render it a conspicuous object. It is believed to have been frequently used as a poison by the negroes in former times, and occasionally its employment has been suspected at the present time. It is stated that by suitable doses it can be administered so as to produce death immediately or after the lapse of some weeks. Experiments by the author prove that this statement has some foundation. Three active substances have been obtained in a pure form, urechitin, urechitoxin, and amorphous urechitoxin. They are extracted from the leaves, which are, physiologically, more active than the other parts of the plant. The fresh leaves contain rather more than half a per cent. of the active principle. *Urechitin* is prepared from the air-dried leaves by extracting with alcohol; by using this solvent in various states of dilution the pure substance was obtained in long four-sided prisms, transparent and colourless, containing 6 per cent. of water of crystallization readily expelled at 100° C. Urechitin is practically insoluble in water and dilute alcohol; more soluble in ether, benzol, amylic alcohol, and strong spirit, and very soluble in hot alcohol, chloroform, and glacial acetic acid. Strong mineral acids decompose it. The reaction with hydrochloric acid proves the substance to be a glucoside. With strong sulphuric acid it gives a characteristic colour reaction. If 0·01 milligramme be treated with a drop or two of strong sulphuric acid, a yellow solution is formed which becomes successively orange, red, mauve, and finally purple. These changes of colour are much hastened by heat or the addition of a trace of some oxidizing substances (nitrates, nitrites, chlorates, bleaching powder, bromine and iodine). The author prefers a trace of a solution made by adding one drop of nitric acid to 100 c.c. of sulphuric acid. The results of several analyses of different samples indicated the formula $C_{28}H_{42}O_8$. It is intensely poisonous and bitter, a solution of 1 in 40,000, having a distinctly bitter taste; its solutions are also very acrid. *Urechitoxin* is prepared by a process somewhat similar to that used for obtaining urechitin, but the leaves are first dried completely at 100° C. Basic lead acetate is also used to precipitate the substance in question. It differs from urechitin in being much more prone to undergo change and become amorphous; it is more soluble in water, spirit, amylic alcohol and chloroform, but less soluble in ether and benzol. It also crystallizes less readily with sulphuric acid. It gives a colour reaction almost the same as that yielded by urechitin, and with hydrochloric acid splits up into an inert substance, and a body which readily reduces alkaline cupric solution. Like urechitin it is bitter, acrid and exceedingly poisonous, one one-hundredth of a grain injected subcutaneously being sufficient to kill a cat within sixteen hours. From several concordant analyses the author deduces the formula $C_{13}H_{20}O_5$. Amorphous urechitoxin was procured as a residue in preparing urechitoxin, but has not been obtained in a pure state. In its toxic and general chemical properties it closely resembles the crystalline substance. Other substances have been obtained by the author, but to avoid confusion he has not named them as their composition was not absolutely certain. In conclusion he states that the poisonous properties of *Urechites suberecta* are mainly due to urechitin, which he obtained by the use of water, alcohol and a temperature never exceeding 38° C., and that urechitoxin is a product of chemical change from urechitin. The author gives full details of the preparation, solubilities, chemical properties, etc., of the above substances. Specimens of the three bodies were exhibited and the colour reaction shown at the meeting.

After the thanks of the Society had been given to the author for his interesting communication, a paper by A. Wynter Blyth, entitled—

The Temperature at which some of the Alkaloids, etc., Sublime, as determined by an Improved Method, was read by Dr. Armstrong. Helwig was the first who systematically employed sublimation as a means of recognizing the alkaloids, etc. Afterwards Dr. Guy greatly improved the process. Very wide statements are, however, still made as to subliming points, *e.g.*, theine, which really sublimes below 100° C. is said by Strauch to sublime at 177° and by Mulder at 184·7° C. The author investigated the subject and found these discrepancies to arise (1) from defects in the apparatus used; (2) the want of a definition of the term "sublimate;" (3) the want of uniformity in general procedure. The method recommended by the author is as follows:—A porcelain crucible about 3 inches in diameter is nearly filled with mercury for low, or fusible metal for high temperatures; a very small quantity of the substance is then placed on a thin microscopical cover-glass and floated on the fluid metal; the substance is then surrounded by a glass ring (cut from a tube), one-eighth to two-thirds of an inch thick and covered by a second thin cover-glass. The crucible is supported on a brass plate fixed to a retort stand and covered by a flask, from which the bottom has been removed. In the neck of the flask is a cork, through which a thermometer passes which has its bulb immersed in the liquid bath of metal. A first rough determination is made in which the bath is heated rapidly and the upper cover-glass changed at every 10°. In a second experiment the disk is changed every 4--5°. In the final determination the disk is renewed every half degree, the temperature being raised with great caution. The author defines a sublimate as the most minute films, dots or crystals which can be observed by a quarter-inch objective and which are obtained by keeping the subliming cell at a definite temperature for sixty seconds. The author has used the same apparatus without the upper cover-glass for determining melting points accurately, the specimen being observed microscopically in order to determine when the first melted drops are formed. The active principles of plants can be classed, in regard to their behaviour to heat, for practical purposes into (1) those which give a decided crystalline sublimate *a*, below 100° C., *e.g.*, theine, thebaine, cantharidin; *b*, between 100 and 150°; *c*, 150-200°, pilocarpine, strychnine, morphine, etc.; (2) those which melt but give no crystalline sublimate, *a*, below 100°, hyoscyamine, atropine, etc.; *b*, 100-150°, papaverine, etc.; *c*, 150-200°, salicin, etc.; *d*, above 200°, solanine, etc.; (3) those which neither melt nor give a crystalline sublimate, saponin, etc. In addition to the above substances the author has examined narceine, narcotine, delphinine, theobromine, picrotoxin and quinidine, and gives details as to their behaviour when heated.

The chairman suggested that more accurate results might be obtained by subliming *in vacuo*; he had found that oxalic acid sublimed without decomposition below 100° *in vacuo*.

The thanks of the meeting were given to Mr. Blyth, and the Society adjourned to May 2, when a lecture "On the Chemical Aspect of Vegetable Physiology" will be delivered by Mr. Sidney H. Vines.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of the above Association, held at their room, 29, Brewer Street, Regent Street, on Wednesday, April 3, Mr. O. Wallis, Vice-President, in the chair, Mr. E. S. Bull read a paper on "Pill Coating."

The paper contained a full and practical description of the various modes of coating pills, including silvering, varnishing, gelatine, pearl and sugar coating, the author giving his experience of each method, with examples of the products, some of which reflected great credit on the manipulator. One of the methods spoken of as giving good results was also one of the simplest, consisting merely in moistening the pills with dilute mucilage, and rolling in French chalk. The author, however, insisted on the importance of skill and perseverance in carrying out the process, and said that with patience and care many of the published formulæ for pill-coating could, although at first seeming impracticable, be made to give an uniform and attractive appearance which is so much desired by the pharmacist.

After the paper, which created much interest on account of the practical way in which it was treated, several members confirmed Mr. Bull's statements in many particulars.

Mr. Wallis then, in answer to a query laid before the members some time previously, read a note on 'Methylated Chloroform and its Impurities.'

Parliamentary and Law Proceedings.

The Sale of Driffield Oils.

In the Chancery Division of the High Court of Justice, an action was tried before Mr. Justice Fry, at Lincoln's Inn, on Wednesday and Thursday, the 3rd and 4th April, in which the plaintiffs were Messrs. Tomlinson and Hayward, and Mr. Thomas Luddington, of Lincoln, and the defendants were Messrs. Lofthouse and Saltmer, wholesale chemists, of Hull. The action was brought to restrain the defendants from manufacturing and selling a specific known as "Luddington's Driffield Oils," or "Luddington's celebrated Horse and Cattle Medicine," by that designation or by any title or name differing only colourably therefrom, so as to lead purchasers to suppose that they were buying the preparation manufactured by the plaintiffs or their predecessors in business, and from representing that the defendants were the successors in business of James Luddington, deceased, or were the sole proprietors of the specific. It appeared that the preparation, which was stated to be of great value in various diseases of horses, sheep, and cattle, was originally invented by one William Luddington, who lived at Driffield, and was sold by him as "Luddington's Driffield Oils." Some time before his death he went to Hull to live with his son James, to whom he communicated the secret of the manufacture. After his father's death, James, being then the sole proprietor, found the business more than he could manage, and accordingly in 1850 he imparted the secret to his brother John, who lived at Market Rasen, and they arranged that they should divide England between them, James taking the north of the Humber, and John the south. John Luddington died in 1870, and by virtue of the provisions of his will and an arrangement made with the widow and the executors, his business devolved upon his son Thomas, one of the plaintiffs. James Luddington died in 1875, and by his will gave his residuary estate, which included the cattle medicine business, to his trustees and executors, Jonathan Duncan and James Simpson, upon trust as to one moiety for the daughter, and as to the other, for the benefit of the son, Jno. Wm. Luddington, or his wife and children, in the absolute discretion of the trustees; but in such a way that the son should have no power to dispose of any part of it. After James Luddington's death, his executors continued the business and supplied the oils to his customers, and amongst others to the defendants. Jno. Wm. Luddington, pretended to sell to Messrs. Lofthouse and Saltmer for a small sum of money, the business of his father, James Luddington, to which he said he was entitled as his father's son. The defendants set up this sale, and contended that by virtue of it they were entitled to manufacture and sell the oils, representing themselves to be the successors of James Luddington, and they further alleged that the sale was made with the privity of Mr. Duncan, one of the executors. This, however, Mr. Duncan emphatically denied. On the 3rd February, 1877, James Luddington's executors sold his business to the plaintiff, Thomas Luddington, and by an arrangement between him and Messrs. Tomlinson and Hayward, they are now the proprietors of the businesses of both James and John Luddington, the two original proprietors, and they now applied for an injunction against the defendants.

Mr. Justice Fry said that upon the evidence before him he was satisfied that Mr. Duncan, the executor, had not concurred in the sale by John William Luddington, and that, even if he had, it would not be binding, because it was necessary that both the trustees should concur in any bargain for the sale of the property. After an exhaustive review of the whole case, he said that he should grant an injunction in the terms asked for by the plaintiffs, which were as follows:—That the defendants, their servants, and agents, be restrained by the order and injunction of the Court from selling or exposing for sale any specific or other medicinal preparation, under the designation of or purporting to be "Luddington's Driffield Oils," or "Luddington's celebrated Horse and Cattle Medicine," or otherwise described by any title or name differing only colourably therefrom, so as to hold out that the preparation so sold or offered for sale was or is manufactured by the plaintiffs or any of their predecessors in business, or that the defendants are carrying on the manufacture or sale thereof, or of any medicinal or other preparation in continuation of or in succession to the business formerly carried on by James Luddington, deceased, and from representing that they are the sole or exclusive owners or proprietors of any such preparation.—His Lordship also ordered the defendants to account for and pay over to the plaintiffs all profits made by them by the sale of the oils since June, 1876, and to pay the costs of the action. —*Lincoln Gazette.*

Obituary.

Notice has been received of the death of the following:—

On the 5th of January, 1878, Mr. David Soulter, Chemist and Druggist, West Grimsby. Aged 30 years.

On the 16th of February, 1878, Mr. William Henry Foster, Chemist and Druggist, Great Crosley, Aged 47 years.

On the 20th of March, 1878, Mr. Thomas Lee, Chemist and Druggist, Wem, Salop. Aged 66 years.

On the 26th of March, 1878, Mr. William Glynn, Pharmaceutical Chemist, Torquay. Aged 57 years. Mr. Glynn had been a Member of the Pharmaceutical Society since 1846.

On the 26th of March, 1878, Mr. Thomas Slann, Chemist and Druggist, Birmingham. Aged 39 years.

On the 2nd of April, 1878, Mr. John Hunter Leighton, Pharmaceutical Chemist, Durham. Aged 54 years. Mr. Leighton had been a Member of the Pharmaceutical Society since 1853.

On the 6th of April, 1678, Mr. Bartlett Hooper, Pharmaceutical Chemist, King William Street, London Bridge. Aged 65 years. Mr. Hooper was one of the Founders of the Pharmaceutical Society and showed a lively interest in it during the earlier years of its history.

Dispensing Memoranda.

We are constantly in receipt of requests for aid in overcoming difficulties met with at the dispensing counter, and so far as lies in our power such assistance is always rendered. But it has been suggested that instead of a reply being given among the Answers to Correspondents, where frequently it stands as an individual opinion, intelligible to only one person, it would be more widely advantageous were such questions published, with an invitation for suggestions as to their solution. We therefore propose as an experiment, to devote a certain amount of space every week specially to these and other "Dispensing Memoranda." In order to assist our younger brethren as much as possible, considerable latitude will be given to the definition of what may be considered to be a difficulty, but it is evident some discretion will have to be exercised in excluding trivial matter. Each note will bear a number, which it is requested may be quoted in all correspondence respecting it. Opportunity will be taken every month of calling attention to the more important points brought out in the various discussions.

[54]. Creasote Dispensing.—Is it not somewhat strange that Mr. Martindale, who writes as a "Pharmaceutical Examiner in Dispensing," should state in the "Dispensing Memoranda," of the 20th inst., that in his "large experience" he never remembers having dispensed creasote in a liquid form for internal administration? I cannot boast of such a "large experience," and yet I have before me the copies of seven prescriptions, all written for different patients, and not all by the same physician, which I have dispensed (some of them many times) within the last two or three years, in which creasote is prescribed for internal administration in the liquid form, and in four of the mixtures carbonate of magnesia is also ordered. I find there is a form in the B.P., and also in the Pharmacopœias of three London hospitals, for "mist. creasoti." I shall be glad to know whether my experience is singular in this matter.

I may just add that in February last I dispensed at the Square, and under Mr. Martindale's supervision, a gargle in which creasote and liq. potassæ were ordered. Would not creasote as a gargle be as obnoxious to the patient as creasote in a mixture?

W. P. Hoare.

[94]. In reply to "Dispenser," for making Carbolic Acid Pills (no other ingredient mentioned in his query), I send the following, obtained from the 'Year-Book of Pharmacy,' 1871, the author recommending it as a good and convenient form for administering carbolic acid:—

℞	Carbolic Acid	1 part.
	Powdered Elm Bark . . .	2 parts.
	Gum Arabic	1 part.
	Tragacanth Paste	q.s.

Mix and make pills of the required size, which may be coated with tolu or silver leaf.

J. W. Barnes.

[94]. Wheaten flour and simple syrup together with carbolic hydrate afford a plastic mass if soft enough. The pills may be varnished.

J. B. L. M.

[95]. Tr. Sap. Virid. Co. is Tinct. Saponis Co. (made with soft soap). Sap. Virid. is Sapo Virid., or in French Savon Vert or Savon Noir, synonym for soft soap.

W.

[95]. In America Sapo Mollis is also called Sapo Niger and Sapo Viridis. The Tr. Sap. Virid. Co. is in all probability a spirituous compound of this soap, somewhat similar to our soap liniment.

M. H. T.

[97]. In answer to "Euryowie's" query, I believe Succ. Taraxaci, B.P., is meant by Sol. Taraxaci. I have dispensed several prescriptions like the above for a well known medical gentleman here, and fully believe his intentions were carried out by the course indicated. As for the direction to "shake the bottle," it is very likely the prescriber's intention to insure to his patient the full dose of Potass. Bicarb. in each dose of the medicine.

Glasgow. J. KITCHEN.

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[102]. Will some of your correspondents favour me with a description of the reaction that occurs on mixing the following?—

℞ Acid. Sulph. dil. . . . . . ʒiss.
Magnes. Sulph.,
Liq. Bismuthi . . . . āā ℥j.
Inf. Calumbæ . . . . ad ℥vj.
M. ℥ss ter die.

J. KITCHEN.

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[103]. Can the following be dispensed without a separation taking place?

℞ Tinct. Benzoin. Co.,
„ Conii . . . . āā ℥j
Misce. ʒj to be used for an inhalation as directed.

My customer first received it from the medical man who gave the prescription, and it was perfectly clear; it was also dispensed in the North of England with the same result. I have tried it with both B.P. and P.L. tinctures of conium, and with each get a thick gummy precipitate which adheres to the bottom and sides of the bottle. Can it be prepared without this? If not I presume it must have been filtered before sending out.

H. M. H.

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[104]. Will you kindly inform me through the Journal, what would be the right thing to give when "Palma Christi" is asked for? A doctor sent for a bottle for his nurse, and we sent Castor Oil as ordered in Gray's Supplement, and he returned it.

N. K.

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[105]. When Syr. Ferri Superphosph. Co. is ordered in a prescription, would Syr. Ferri Phosph. Co. (Parrish's Food) be meant. Would anyone give me the composition of the Superphosphate.

B. P. BURN.

Durham.

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[106]. When Sodæ Carb. is ordered in a prescription would it be correct to use sodæ bicarb. ($NaHCO_3$)? If the physician meant (Na_2CO_3) sodæ subcarb. would he not put sub. before the carb. in the prescription?

Westminster. G. F. W

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[107]. LIQUOR HOFFMANI.—Will some reader kindly inform me what should be dispensed as Liquor Hoffmani? Squire mentions spiritus ætheris, B.P., while Beasley and Neligan give a preparation containing ethereal oil.

Belfast. S. L.

Notes and Queries.

[585]. BALSAM OF ANISEED.—In answer to query 585 in last week's issue, I forward enclosed formula for Balsam of Aniseed, a preparation that is extensively sold in this neighbourhood at 2*d.* per ounce.

Balsam. Anisi.

℞ Succ. Solazzi . . . . lbj.
Aq. Bullient. . . . . lbiv.
Theriacæ. . . . . lbiv.

Boil the juice with the water until dissolved, make up the lost weight with water, then add the treacle; gently simmer until it is mixed with the juice.

℞ Morph. Acet. . . . . . . ʒss.
Acid. Acet. Fort . . . . . ʒiij.
Mix.

℞ Ol. Anisi. . . . . ʒss.
Sp. Vini Rect. . . . . ℥iv.
Dissolve the oil in the spirit, then add—
Boiling Water . . . . ℥iij.
Tr. Camph. Co. . . . . . . ℥xvi.
Mix all together and strain.

Dose.—Adults, one teaspoonful; fourteen years and upwards, half a teaspoonful; seven years, thirty drops; four years, twenty-five drops; three years, twenty drops; two years, fifteen drops; one year, ten drops.

F. W. HALLER, *Boston.*

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[588]. SKELETON LEAVES.—Could you inform me through the Journal of any way for making skeleton leaves quickly? R. S. P.

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[589]. SYR. SODÆ HYPOPHOS.—Will some reader kindly give me the form for Syr. Sodæ Hypophos.; also one for Syr. Ferri Superphos. et Calcis?

JOHN C. B. MORRIS.

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[590]. BROWN SMELLING SALTS.—Can any reader refer me to a really good formula for Brown Smelling Salts?

A. E. J.

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[591]. BLACK WRITING INK.—Can any correspondent kindly inform me of a method of making ink that will both write black almost as soon as made and keep well? The chrome ink is uncertain, while that made from galls does not write black until kept some weeks.

ALPHA.

BOOKS, PAMPHLETS, ETC., RECEIVED.

INDUSTRIAL CHEMISTRY. A Manual for use in Technical Colleges or Schools, and for Manufacturers. Based upon a Translation of Stohmann and Engler's German Edition of Payen's 'Précis de Chimie Industrielle.' Edited by B. H. PAUL, Ph.D. London: Longmans, Green and Co. 1878. From the Publishers.

A KEY TO ORGANIC MATERIA MEDICA. By Dr. JOHN MUTER, M.A., F.C.S. Second Edition. London: W. Baxter. 1878. From the Publisher.

MÉMOIRE SUR LA LIQUÉFACTION DE L'OXYGÈNE, LA LIQUÉFACTION ET LA SOLIDIFICATION DE L'HYDROGÈNE, ET SUR LES THEORIES DES CHANGEMENTS DES CORPS. Par M. RAOUL PICTET. London: Asher and Co. 1878. From the Publishers.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

"NOT ONLY PATENT MEDICINES, BUT ALSO GENERAL PHARMACY IS GOING TO GRIEF."

Sir,—The above is the heading of a letter in this week's Journal, and the statement is only too true. But I deprecate the fretting and fuming and "kicking against the pricks" exhibited week after week in your valuable periodical; for if the writers can do nothing else, it is simply ridiculous, because utterly futile, and consequently a waste of pen, ink, and time on the part of the fretters, fumers, and kickers, as well as a waste of your valuable space. That a revolution in the retail drug trade is in progress is too true, and like revolutions in general it is utterly impossible to forecast the ultimate result.

"Sussex," query "Senex," in the letter referred to, lets us know that he has been considerably over 50 years in the drug trade. Surely in that time he should have made a fortune, and should at least now leave the field to younger blood, to battle through the great trials that are evidently darkly looming on the horizon. For however indifferent the trade may already have become, and however much worse it may be fated to be in the future, the drug trade during the last 50 years has certainly been as good as any other for the middle class to gain a livelihood and a competency by. If "Sussex" or "Senex" will search the files of the *London Gazette* he will find that the chemists and druggists figure as proportionately infrequently in the list of bankrupts and insolvents as any tradesmen.

S. intimates that between 40 and 50 years ago, when he first went to London, C.s and D.s were springing up like mushrooms; very good evidence of the excellency of the business. I observe by some statistics before me that 100 years ago the marriages in London averaged annually 6000, now they reach 100,000. S. surely must see reason why the C.s and D.s of the metropolis should rapidly increase during this century of time. It strikes me he went to London at an excellent time, but made a mistake in not casting his lot in among the "mushroom" number. Had he done so, probably long ere this he might have "thrown physic to the dogs," have galloped, an' he listed, over Brighton Downs or lounged in its Aquarium, instead of having yet apparently to stand behind a counter, fretting at his neighbour selling "patents" at cutting prices. He and half a score more who have "piped" to the same tune in your columns can get no one to "dance;" they want something to be done for them, and like drowning men they catch at straws. They seem to have a vague idea that the Council can prevent this cutting down of prices. S. says he has received a circular from one who is a candidate for a seat in it, who promises to "use his best endeavours to promote the interests of the retail trade," and that he is the man for his money. He says, "he has read that once upon a time a mouse could release a lion from his snare." He pictures himself the ensnared lion, and thinks he has found his "mouse," and very much "a mouse" no doubt he will find him. He thinks the lion and mouse story an o'er true tale, and not a fable, and sees no reason why such a wonder shouldn't happen again.

S. has a singular notion of the meaning of the word "monopoly." He says that we should "agitate" (forgetful of the homely proverb, "the more you stir, etc."), "petition and strive together against the cruel monopoly of village grocers, drapers, advertising tailors, dabblers in medicine, and pharmaceutical chemists by examination calling themselves co-operative drug companies, clipping our respectable business into shreds" (!). If an "enterprising" trader should open a shop in S.'s near neighbourhood and advertise the primest joints of Herefordshire beef and Southdown mutton at 2*d.* per lb. less than S. pays his butcher, would S. be too "respectable" to patronize him? If the "respectable" butchers of the locality were to propose to "agitate and petition against the cruel monopoly," wouldn't S. laugh consumedly? Does S. not know that for a score or two of years the druggists have sold packed tea, coffee, and cocoa, not to mention many other articles which "legitimately" only grocers can sell? Perhaps S. himself is not guiltless of this "illegitimate" sin. Did he ever hear of the grocers threatening "to agitate and petition against" it? If they had, I guess S. would have thought it "no end of a joke!" Grocers in selling "patents" are clearly but retaliating. Then druggists sell chest protectors and Cash's towels, drapers' or hosiers' articles, and pickles, sauces, combs, and hair-brushes, and a host of other articles not "legitimately" their trade.

Now with regard to the special question of "patents." What feasible reason can S. assign for the legislature permitting only druggists to vend them? They may be made by anybody, by any ignorant old quean, surely then they may be sold by anybody. What greater risk does the public run by my neighbour the grocer or draper vending them, than by my doing so? If a customer applied to me for chlorodyne, I deem it no part of my duty to warn him that it is a patent medicine and enumerate the half dozen "poisons" it is reputed to contain. All I do is to sell him the largest bottle and the greatest number of bottles he may be disposed to purchase.

The trade of a retail druggist has hitherto been one of large profits and small returns, that of a grocer smaller profits and larger returns. Can S. assign any abstract reason why such a state of things should of necessity be? Possibly the time will come when the profits of a druggist's business will be much smaller than heretofore, and his returns be increased in proportion. But as physic in a very great measure is an exception to the rule of lower prices creating larger demands, if such a state of things is to ensue, the number of druggists must be reduced, and the evil days which appear to be coming upon us will have to be borne and the furnace passed through. In the town from which I write, the drug trade had, until recently, from time immemorial been conducted in a fairly "respectable" manner. I employ a qualification. About a quarter of a century since, one black sheep, in order, if possible, to aggrandize himself at his neighbours' expense, tried to make a "leading article" of seidlitz powders, and dropped them from 1*s.* 6*d.* to 1*s.* and also charged a little less for putting up prescriptions than he knew his competitors did. Barring this we were "respectable," and though half the druggists sold tea, no grocer had retaliated. Recently a new man (a druggist) dawned upon us, who carried on "respectably" for a while, but without eminent success, probably because where his tent was pitched druggists were thick enough without him. Be that as it may, he has ceased to be "respectable," is now an advertizing cutter, and is selling at such prices that he must do four times the trade he did to better his position sufficiently to enable him to hold on. It remains to be seen if he will. If he should it will only be by so seriously affecting the trade of the rest of the druggists, that general retaliation will ensue, and one half of us will assuredly go to the wall. There is no help for this sort of thing. S. and the whole host of fretters and kickers had better try to look "the accursed thing" heroically in the face, and cease to badger and abuse the Council which is powerless to help them.

HAMPSHIRE.

The Sale of Patent Medicines.

Sir,—Permit me space for a few remarks in reply to "Tento," "Benevolent," and "Treu und Fest," in the Journal of the 13th inst.

"Tento" says he "doubts not the eight registered chemists I mentioned in over seventy villages, besides hamlets, will be fully competent to supply them with all the medicines and patents they require without the interference of unqualified persons." No doubt they would, but will he say because a resident of any of these villages lives ten or more miles away from any registered chemist, and that is the case with quite one-third of them, he must lose a day's work to get a pennyworth of laudanum, a dose of spirit of nitre, or any other drug or patent medicine that may be required in an emergency, and emergencies will arise even in the best regulated villages, where there are no qualified chemists, as well as where such reside. Over a third of these villages are quite this distance, and why should they not be able to get simple remedies at home. I would ask "Tento" what these people have done amiss that they should be thus taxed and inconvenienced. No chemist could live in these villages, even if no other shopkeeper sold an ounce of medicine or single patent; every one who understands and knows the country is aware of this

The reasoning of these gentlemen is this: We cannot serve them; it will not pay us to do so; and they say in effect, no one else shall. This is what I call the "dog in the manger policy," though I think at the same time they do not intentionally mean so, but the effect is the same.

One correspondent suggests an application to the surgeon in an emergency; here is another tax and injustice to the village poor. Benevolent suggestions are made that the emergency could easily be met by going by rail, which means that more than a third of the village residents would have to traverse ten miles to a station, and nearly this average to the nearest surgeon, who might when sought be as many miles in another direction.

I quite agree with your correspondent that some remedy is needful to check the evil of underselling and sale by unregistered persons, and I feel sure we should all feel indebted to any one who may suggest a practical remedy for these and other grievances from which the trade suffers; but be assured that in any legislation on this subject, the public must be taken into account; the days of monopoly of any kind are ended unless the public requirements are fairly met.

One correspondent suggests that in these cases people should keep a stock of simple medicines by them. Possibly even in this case the emergency that has arisen might not be anticipated, and hence not provided for; but supposing all emergencies could be foreseen, it would only be the wealthy members of the community could keep such stock, and they would either have to sell them to their poorer neighbours, or act the part of the "Lady Bountiful." Neither positions are desirable.

I am aware the course I recommend is exceptional, so are the circumstances, and require exceptional treatment. My opinion is still that the wisest policy for legislation would be to register some person in every village for the sale of both poisons and patents where there are no chemists. Before registering see if they have a fair knowledge of drugs, and no other person should be allowed to sell either patents or medicines of any kind except those registered. This would end, I think, in villages proximate to each other, forming a centre, where such a trade might be cultivated as would make it worth while for a qualified chemist to settle, which I, in common with every well-wisher to the trade, would be glad to see.

When we as chemists have duly considered the wants of the public and their requirements, we shall then be able to take a high standpoint for our rights and privileges in any future legislation, which in my opinion cannot be far off.

A. G.

Chesterfield, April 16, 1878.

The Patent Medicine Question.

Sir,—Allow me to state that I am heartily glad to see that some of our kith are beginning to take an interest in the above important question. Some of your correspondents seem to be labouring under delusions, others again appear to understand the question in all its bearings, and a few seem to have nothing else in their heads than to garble and snarl at each other. We must fling all petty quarrels to the wind. If we expect success, we must stick together as one and lay our petition boldly and firmly.

John Mudie.

Opium Eating.

Sir,—In corroboration of your extract from the *Bradford Observer*, under the heading "Parliamentary and Law Proceedings," in a recent impression, I can well remember when I was an apprentice at Newark, over thirty years ago, that a man one day came into the shop and asked for three drachms of opium, which he said he took at one dose, and was "all right" for the rest of the day, and he came for the same dose next morning. He walked about the country, supporting himself by selling copies of the Lord's Prayer, written in a most delicate hand in the space of a shilling's circumference, and the Belief in that of half-a-crown, and a long particularization of the mystical number seven, a copy of which I bought, and still have in my possession. The account he gave of himself was that he had been a non-commissioned officer in the army, had a pretty wife, and in resenting the improper advances of a superior officer to her he struck him, and was then dismissed the army; henceforward he commenced the opium eating. I dare say some of my cotemporaries can recall this; I can remember his appearance very well—wan-looking and thin. Since I have been in business the largest morphia consumer I have had took about three two-drachm bottles of it in fourteen days. He died some years back, and his account, like many of these customers', remains unbalanced.

John Rayner.

Long Row, Nottingham,

Election of Women to Membership.

Sir,—Several addresses have been issued by candidates for the Council, but I have seen nothing in them at present in reference to a question which will engage a considerable time at the next Annual Meeting. It will be remembered that in November of last year, two ladies who had passed the Minor examination in a highly creditable manner, applied to be elected Associates of the Society. In the opinion of some of our representatives the Council had not the power to act contrary to the decision of the members in general meeting. Others believed that members had nothing to do with it, but that it remained with the Council to elect or reject as they might determine. Even Mr. Hampson doubted whether the executive are legally bound to elect ladies at all. But there are some who think that sex has nothing to do with the question and consider when an application is made by any "person" educationally qualified, should the Council refuse, their decision could be set aside by mandamus. It is, therefore, important in the election of Council that members should know what are the views of candidates who desire a seat at the next Council table, because if the general meeting pass a vote in favour of female admission the Council might fall back upon what it considers its prerogative; but if the decision is given against the ladies, then the Council could cover its predilections under the plea of carrying out the vote of the members. Under any circumstances the result should be decided by the wishes of all, and as it is impossible for every one to be present at the Annual Meeting the opportunity ought to be given to those absent to vote for those who will best represent their wishes on a subject of considerable importance which will not be allowed to remain unsettled.

John Wade.

174, *Warwick Street, Pimlico, S.W., April* 20, 1878.

To the Benevolent.

Sir,—Besides the subscriptions you have already kindly announced as having been received by me, for Mrs. Dixon and her family, amounting to £23 18*s.* 6*d.*, I have now to acknowledge, with my best thanks, the following:—

	£	s.	d.		£	s.	d.
Savory and Moore	2	2	0	J. J. Burnett	1	1	0
J. Robbins	2	2	0	H. F. Peake	1	1	0
John Williams	1	1	0	W. F. G. S.	0	10	0
George Pugh	1	1	0	T. W. Harman	0	2	6
Patrick Keane	0	10	6	Battley and Watts	3	3	0
B, W. Priest	1	0	0				

Robert Chipperfield.

P.S.—In last week's Journal Thos. Juves should have been Thos. Jeeves.

Southampton, April 17, 1878.

"*Ranunculus*."—Golden Saxifrage (*Chrysosplenium oppositifolium*).

"*Honesty*."—Unfortunately your experience is not an uncommon one, though too much dependence should not be placed upon the statements of customers.

S. J. T. M.—(1) We cannot furnish you with any better mode of making a B.P. preparation than compliance with the directions given in the Pharmacopœia. (2) We are not acquainted with the "Concentrated Infusions of the Pharmacopœia." Answers to most of your other questions may be found in any good receipt book, Cooley's, for instance.

"*Ph. Ch.*"—See a paper by Dr. Squibb, in vol. vii., p. 712.

"*W.*"—Liquid cochineal may be prepared by digesting powdered cochineal in a weak solution of ammonia or sal. ammoniac, and afterwards diluting with water. Other recipes are given in Cooley's 'Cyclopædia' and Beasley's 'Receipt Book.'

A. D.—Pepsine wine may be prepared by macerating pepsine in any wine suitable for the purpose. Dr. Symes's experiments, however (vol. iv., p. 1), appeared to show that an alcoholic liquor is not a good vehicle for administering pepsine.

J. S.—*Rhamnus amygdalinus*. See Museum Catalogue, p. 22.

"*Glycerinum*.—See Mr. Pocklington's paper on the preparation of glycerine jelly in vol. v. of the present series of this Journal, p. 401.

A. Wright.—Your specimens are probably correctly named, but such specimens can serve no useful purpose as it is impossible to identify them with certainty. The henbane leaves are probably the autumn leaves of the first year's growth of biennial plants.

Communications, Letters, etc., have been received from Professor Dymock, Messrs. Bailliere et fils, Professor Bentley, Dr. Symes, Mr. Paris, Curator.

EUCALYPTUS GLOBULUS.*

BY PROFESSOR BENTLEY.

The reputed influence of plantations of *Eucalyptus globulus* in destroying the malarious character of marshy districts, and thus preventing the fever which is their usual accompaniment, and the many other uses ascribed to this plant, have naturally excited very great interest, and have induced me to make it the subject of my lecture this evening, and at the same time to refer generally, to the properties and uses of other species of the same genus.

This very fine tree was first discovered in 1792, by the French botanist Labillardière, in the island of Tasmania. It is also to be found abundantly in Flinders Island, in Bass's Straits, and on the mainland of Australia over a large area. It appears that M. Ramel had his attention called, while in Melbourne, by Baron Mueller to this tree, and in 1856 he sent some seeds to Paris, the first that had been forwarded to Europe. M. Ramel then called attention to the great value of the *Eucalyptus globulus* as a forest tree, and also claimed for it the power of destroying the miasmatic influence of marshy districts. It is to M. Ramel, therefore, that we owe the introduction of this plant into Europe, and also for first directing attention to its reputed antimalarial influence.

The plant has since been introduced into Southern Europe, and many parts of Africa, Asia, and America, where it has now become naturalized. Specimens may also be now commonly seen in this country, where, however, except perhaps in the West of Ireland and Cornwall, it cannot support the winter without shelter. It has even flowered in the open air at Wexford. But it is very sensitive to frost, so that even throughout the South of Europe, where it flowers and fruits abundantly, and even produces ripe seed, it is sometimes cut off by frost.

Subsequently to M. Ramel's notice of the antimalarial influence of this tree, many physicians have borne testimony to the febrifugal properties of its bark and leaves when administered internally, and of other valuable properties and uses of this and other species of *Eucalyptus*; so that it is especially important that it should be brought under the notice of the Pharmaceutical Society. We commence, therefore, by referring generally to the botanical characters of the genus.

Botany.—The genus *Eucalyptus* belongs to the natural order *Myrtaceæ* of botanists, the same order to which belongs the Myrtle, the Clove tree, the Pimento or Allspice, the Cajuput-oil plant, the Pomegranate, and many other plants, which are well known as ornamental trees or shrubs, or for their timber, or from yielding various valuable medicinal and economic substances. All the *Eucalypti*, of which there are about 150 species,† with the exception of a very few, and, in some cases, doubtful species, are natives of Australia, where they are commonly known either as "gum trees," from yielding what are usually described as gummy or resinous products, or as "stringy-bark trees," from their rough fibrous barks. Various other local names are also applied to the different species by the colonists in Australia, such as "blue," "red," and "white" gum, peppermint, turpentine, iron-bark, etc. All the species have evergreen leaves, which (like those of certain species of *Acacia* and other trees that are natives of Australia) after the trees have arrived at a few years of age, in consequence of the twisting of their petioles, hang in an oblique or even vertical direction from the branches, and thus give a very peculiar aspect to the forests of Australia by the differences in the light and shade produced by such trees from those of forests generally in other parts of the world. The leaves, like those of the myrtle, orange, rue, and numerous other plants, are studded with internal glands or receptacles of strongly scented volatile oils, as may be seen by holding them up before the eye so as to allow the light to shine through them, when they present a semi-transparent dotted appearance. The flowers, which are usually pinkish or white, are frequently very beautiful. These flowers, when fully expanded and white, much resemble those of the myrtle, but are at once distinguished from them by the absence of petals; and in the bud state by their peculiar calyx, which is closed at the top by a little lid, which is thrown off as the flower expands. This little lid, which is technically known under the name of operculum, is generally regarded to represent the petals soldered together and much modified. It is from this lid that the name of the genus is derived as follows:—ευ, well, and καλυπτός, covered. The stamens are very numerous. The fruit, which consists essentially of the hardened and enlarged calyx tube and disk enclosing the capsule, is somewhat globular or tubular; it contains a large number of seeds. These are generally extremely minute; thus, according to Mueller, one ounce of the seed of the *Eucalyptus globulus* tree contains over 10,000 seeds, and a similar weight of another species more than double that number, and thus, provided all germinated, from one pound of the seeds of *Eucalyptus globulus*, nearly 162,000 plants could be raised. Mueller has also stated that if even the seedlings of one quarter of the seeds of one pound were finally established, they would suffice to "cover 404 acres of ground, assuming that we planted at the rate of 100 trees to the acre."

We now pass to the more particular description of *Eucalyptus globulus*.* This plant is commonly known in Australia as the "blue gum tree." As already noticed, it is a native of Tasmania and of parts of the mainland of Australia, its favourite situations being damp slopes of valleys with a southern aspect. The foliage presents in a remarkable degree the changing aspect so noticeable in the species generally. Thus in young plants the leaves are opposite, on short straight stalks, placed horizontally, and of a very pale greenish-blue almost white colour; but on the full grown tree they are alternate, with stalks about an inch long, and twisted half way round, so that the blades which are then sickle-shaped, hang vertically or somewhat obliquely on the tree, instead of horizontally. These leaves are also of a dull green colour. The flowers, which are large and axillary, and almost sessile, are solitary, or in clusters of two or three crowded closely together; and in the bud-state they are covered by the lid or operculum of the calyx, which separates entire from the calyx-tube at the flowering period. The specific name is derived from *globulus*, a little ball,

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* Lecture delivered before the Pharmaceutical Society, April 17, 1878.

† Baron Mueller is now preparing for the press an illustrated work on the genus *Eucalyptus*.

* For a coloured figure and full botanical description of this plant, see Bentley and Trimen's 'Medicinal Plants,' · a 15, tab. 109.

from the button-like form of the fruit; or from the somewhat rounded character of the operculum.

Growth.—One of the most remarkable facts connected with this plant is the extraordinary rapidity of its growth, both in height and girth of stem. It has been well said "that any man in twenty years time, could find himself, if he chose, surrounded by a forest of his own planting." This may be illustrated by numerous examples of its growth. Thus, M. Raveret-Wattel says,that a tree "of ten years old, ordinarily presents the development of a well-grown oak of a century, and it is not rare to meet in Australia with specimens in their fiftieth year from 160 to nearly 200 feet high, and 50 to 60 feet in circumference at the base."

These statements are also fully confirmed by the rapid growth of the Eucalyptus trees in Spain, Algeria, Italy, and other parts of the globe, which are suitable for their development. Thus, in the neighbourhood of Mentone, as it appears from the following extract of a letter to the late Daniel Hanbury from his brother, in reply to one written at my request in 1874, that, "In a good soil with a moderate amount of moisture the growth of the *Eucalyptus globulus* is astonishingly rapid. In the ground of the Palazzo Orango, four miles east of Mentone, there is a specimen which was planted in March, 1869 (this is just five years ago), being then a seedling of about three feet high. This tree was measured a few days ago, when it was found to be forty-eight feet high, with a trunk having a circumference of three feet at a yard above the ground." Mr. Frederick Janson Hanbury, who has recently been on a visit in the same district, says that many trees in Mr. Hanbury's garden at Mortola must now be at least seventy feet high. A pupil of mine, Mr. Hardwick, now at San Remo, in a recent letter to another pupil, Mr. R. H. Parker, also states, that trees which were planted there twelve years ago are now eighty feet high.

As might be expected, a tree which grows with such marvellous rapidity, frequently attains to a great height, very commonly over two hundred feet, or about the height of the Monument near London Bridge. In some cases it even reaches over three hundred feet, and in one instance a tree has been known to attain the colossal dimensions of three hundred and fifty feet in height, and one hundred feet in circumference; thus rivalling in these respects the Mammoth Pine of Oregon (*Wellingtonia gigantea*). There is no question that with the doubtful exception of this tree it excels in dimensions any tree in the world; and as it appears from recent measurement that the height of the *Wellingtonia gigantea*, Lind., has been much exaggerated, it may ultimately be proved to be the tallest of all trees.

A tree of such rapidity of growth and beauty, independently of its important properties and uses, to be presently noticed, has naturally excited much interest, and it has now become naturalized in various parts of Europe, Asia, Africa, and America, so that in many parts the aspect of the country has been entirely altered. It has recently been planted along the line of the Central Pacific Railway, the company of which has arranged to have 40,000 trees set along the five hundred miles of their right of way. This is only the first instalment, as it will require about 800,000 trees for the five hundred miles of valley where they are to be cultivated. The important object sought to be gained by planting this tree on such a large scale is to increase the humidity of the region, and lessen its liability to droughts. It is well known that the deficiency of forest trees over large tracts of country has a most injurious effect on the climate; hence should the conditions be found favourable in this part of the world, which we very much fear, for its growth, we anticipate very important results from this new application of a now celebrated tree. But we must proceed, as far as time will allow, to refer generally to the properties and uses of this tree, as well as incidentally to those of other species of Eucalyptus.

Properties and Uses.—The first and most important influence which the *Eucalyptus globulus* is now commonly said to exert, and that which has brought it more especially into notice, is its power of improving miasmatic climates by destroying the paludal miasm which causes fever in such districts; from which circumstance it has been called "the fever-destroying tree."

Its influence in this respect was first noticed in its native country Australia, and evidence to the same effect has now been obtained from all parts of the world where it has been introduced, and which are favourable to its growth. Thus, in Algeria, where it has been tried on a large scale, and in Spain, districts previously noted for their pestilential air, and consequent prevalence of fever, have now become quite free from disease. At the Cape also, in a very few years, its cultivation has completely changed the climatic condition of the unhealthy parts of that colony; thus, in the neighbourhood of Constantia especially, it has been stated that a noted fever spot, which was covered with marsh water, both in winter and summer, has in five years been dried up by the planting of 14,000 of these trees, and the inhabitants now enjoy excellent health. In Cuba again, marsh diseases are fast disappearing from the unhealthy districts where this tree has been introduced. An interesting statement to the same effect has recently also been reported from Italy, where the planting of some Eucalyptus trees, which in six years had grown to a height of over thirty feet, had rendered healthy a part of the Campagna, which had hitherto been regarded as the most fever stricken part of that unhealthy district. The tree has now been planted to a large extent in Italy, and hopes are entertained that in a few years malaria will be as effectively expelled from that country as ague has been from Lincolnshire. The testimony in favour of its anti-malarial influence is so strong that, allowing for exaggeration in some cases, it can scarcely be doubted that this tree does produce a most beneficial effect by destroying the fever-producing miasm of marshy districts; and that it should consequently be introduced into all countries and districts where the climatic influences are favourable for its development, and where such miasmatic emanations are to be found.

The influence of the Eucalyptus in this respect is commonly regarded as being serviceable in two ways. First, by the far spreading roots of this gigantic tree pumping up water as it were, and thus draining the soil; and secondly, by the odorous emanations from its leaves having a disinfectant and antiseptic influence on the paludal miasm. The influence of the latter has been generally supposed to be but small, but in a lecture on the Eucalyptus, which I delivered at the Royal Botanic Gardens in Regent's Park, four years ago, I then stated my reasons for believing that the emanations from the leaves of groves of Eucalyptus had some influence in destroying marshy miasms, and thus improving the healthiness of the district. Since then the very interesting investigations of Kingzett have proved that under the influence of air and moisture, both peroxide of hydrogen and camphoric acid are formed from volatile oils, the former a powerful disinfectant, and the latter an antiseptic; and hence I think there can now be no doubt, that the healthy influence of Eucalyptus trees is, to some extent at least, and probably more than we imagine, due to the volatile emanations from the leaves under the influence of air and moisture, possessing direct disinfectant and antiseptic properties and thus destroying the injurious effects of paludal miasms.

Another circumstance which has an important bearing upon the antiseptic properties of the leaves of Eucalyptus is that the *eucalyptol* of Cloez, the chief constituent of the volatile oil contained in the leaves, has been recently proved to possess great antiseptic properties.

The greatest influence is, however, in my opinion, produced by the power the roots possess of absorbing water from the soil. It is stated that a moderate sized Eucalyptus tree absorbs as much as ten times its weight of water from the soil; and hence, allowing for exaggeration, the enormous suction power of large plantations of such trees may in some degree be judged of; so that when thickly planted in marshy places, "the subsoil is drained in a little while as though by extensive piping." That the main influence of Eucalyptus trees is thus due to the absorptive power of the roots is also borne out by the fact that other plants of rapid growth, when planted in marshy districts, have a sensible effect in diminishing their malarial influence. This is notably the case with the Sunflower, which is grown for this purpose to a large extent in the swampy regions of the Punjaub and other parts of the world; and the effect has been that districts which were previously remarkable for their insalubrity are now reported to be entirely free from miasmatic fever.

We must now leave this interesting subject and proceed to allude briefly to the other properties and uses of this tree and of other species of *Eucalyptus*.

In the first place we may refer to the essential oils, which are obtained in large quantities by aqueous distillation from the leaves of the *Eucalypti*. This oil is stored up in the pellucid glands already referred to as contained in the leaves, and readily observed when they are held up to the light, by the semi-transparent appearance they then exhibit. These oils are now prepared on a large scale, and form an important article of commerce between this country and Australia. They have generally a somewhat camphoraceous smell, but the odour differs much in the various species; thus, that of the *Eucalyptus globulus* is by no means agreeable in its concentrated state, while that of *E. citriodora* has a pleasant citron-like odour. Most of the oils as imported have a yellowish colour, although others are somewhat blue, but when redistilled they are all nearly colourless.

These oils have been employed for various purposes; thus, that of *Eucalyptus oleosa* as a solvent for resins is much used in the preparation of varnishes; but they are also of value for diluting the more delicate essential oils which are used in perfumery. Mr. Rimmel has especially recommended them for this purpose, and specimens of soaps and other substances thus scented are now exhibited. The oils more especially recommended on this account are those of *Eucalyptus amygdalina*, *E. globulus*, and *E. citriodora*.

A recent application of the oil of *Eucalyptus globulus* is also by Mr. Rimmel, who has introduced what he has termed an "Aromatic Ozonizer," and which he recommends as a *pleasant disinfectant*. It is in the form of a coarse powder, composed, I am informed, of pine-wood saw-dust, through which is diffused the oil of eucalyptus, and also the oils of lavender, rosemary, and thyme. I have tried it for some time in my library and elsewhere, and it certainly communicates an agreeable freshness and pleasant odour to the air of the rooms. It has also been elsewhere stated that an excellent disinfectant may be made by adding from one to four ounces of eucalyptus oil to a bushel of deal saw-dust.

Eucalyptus oil has also been used as an external application for similar purposes as that of cajuput oil, but it is far inferior to it in value.

From the quantity of oil contained in the leaves of *Eucalyptus globulus*, they yield, when burned, a very large proportion of gas; and it is stated that one of the towns in the gold regions of Australia was for a long time lighted by gas thus obtained. The oil thus derived is said to produce a very brilliant flame; and as much as 10,000 cubic feet have been obtained from a ton of leaves. But the expense of collecting these leaves in a country where labour is so costly, appears to have proved a barrier to its employment, except under altogether exceptional circumstances.

This oil is by far the most important constituent of the leaves. Its principal constituent was found by Cloëz, some years since, to be a colourless liquid, which he regarded as analagous to camphor, and to which he gave the name of *eucalyptol*. This has been recently shown to be a mixture of at least two hydrocarbons, a *terpene* and *cymene*, and an oxidized substance.

It was formerly imagined that eucalyptus leaves also contained quinia, or some one or more of the other well-known alkaloids of cinchona barks. But the experiments of Broughton entirely disprove this; for upon careful examination of the leaves and likewise of the bark, this chemist states that neither quinia, nor any of the other alkaloids of cinchona barks, as quinidia, cinchonia, or cinchonidia, exist in any proportion.

The timber of several species of Eucalyptus is remarkable for its solidity, hardness, and durability; it has also great power in resisting the attacks of insects and the teredo, and the influence of moisture. Moreover, this plant, as recently noticed by Sir Joseph D. Hooker, "seems to be proof against parasitic plants; the bark being deciduous causes the seeds of any parasite to be dislodged before they have time to germinate and so obtain a footing in the tissues of the plant." So that, as Sir Joseph Hooker says, in countries not too hot for its growth, "its timber will probably turn out to be extremely useful." This plant is, however, not always protected from parasites, as may be seen by the interesting specimen on the table, of a piece of the stem of Eucalyptus, from which the parasitic Loranthus is growing, and for which I am indebted to Mr. Holmes.

The great length of the planks that may be obtained from this tree is another important element in its favour. Thus, as it commonly does not send out a branch until the trunk is 100 feet high, in many cases, planks of this wood have been cut of one hundred and sixty feet in length, twenty inches broad, and six inches in thickness; and larger planks may be obtained, for in 1855, a plank was prepared for the Paris Exposition, but no vessel could be found capable of conveying it to Europe. These qualities render the timber especially valuable for ship building, railway sleepers, maritime works, and where beams of great span are required, and for numerous other purposes.

Baron von Mueller has also shown that the ashes of the wood of the species of Eucalyptus contain a very large proportion of potash. Their richness in this respect may be estimated from the fact that while the produce from the ashes of the Elm and Maple, which are the trees most esteemed for this purpose in America, is estimated at about 10 per cent., the ashes of the Eucalyptus yield as much as 21 per cent. of potash.

The barks of various species of Eucalyptus have also been applied to useful purposes. Thus, in the *first place*, they are extensively used for tanning and dyeing; and they owe their value in these respects to the presence of similar constituents to those contained in oak bark and other substances commonly employed for such purposes in this and other countries. *Secondly*, the barks of many species may be used in paper making. Several specimens of packing and printing papers thus prepared are now exhibited, as also a specimen of writing paper from the bark of one species.

A number of species of Eucalyptus also exude a very astringent substance, which, from its resemblance to the ordinary medicinal kino, is commonly designated as *Australian*, *Botany Bay*, or *Eucalyptus Kino*. This substance, which, when it first exudes, trickles like blood down the bark of the trees in a semi-fluid state, ultimately hardens into dark red shining masses, which have a very astringent taste. It is employed for similar medicinal purposes as our official kino, and also for tanning, dyeing, and other important purposes.

Another substance called Australian or Eucalyptus Manna is also yielded by one or more species of Eucalyptus. This manna is usually in small, rounded, opaque, whitish masses, which have an agreeable sweet taste. In its action it is similar to the ordinary manna used in this country; it contains a peculiar kind of sugar, called *melitose*. It exudes abundantly during the summer months through punctures or wounds made in the leaves and young bark. As it exudes it hardens, and drops from the leaves on to the ground in pieces which are sometimes as large as an almond.

We have now, in conclusion, to allude very briefly to the medicinal properties of the *Eucalyptus globulus*. So many medical practitioners have testified to the febrifugal properties of the leaves that their value in the treatment of intermittent fever can scarcely be doubted. In Australia also, and in some other districts where the plant has been introduced, the leaves have long had a popular reputation in the treatment of fevers. Their antiperiodic properties are, however, far less manifest than those of cinchona barks, and some of the exaggerated statements that have been made in reference to the efficiency of the leaves appear to have arisen under the mistaken impression of their containing one or more of the alkaloids of cinchona barks. The bark is also said to possess similar properties in this respect to the leaves. Several preparations of both bark and leaves, such as the tincture, fluid extract, syrup, extract, lozenges, pills, and many others, are now exhibited; but the best form of administration is probably the alcoholic tincture. Eucalyptus leaves have been likewise used for their stimulant and antispasmodic properties. The tincture has been especially recommended in bronchitis; and in the form of cigarettes the leaves are now frequently smoked, and are reputed when thus used to be efficacious in asthma, whooping cough, bronchitis, and other affections.

The preparations of eucalyptus have also been used with success in other affections; and lately a new method of dressing wounds, by using eucalyptus leaves instead of lint, has likewise been recommended. The leaves are simply laid on the wounds; and it is said that their balsamic nature not only cures, but also removes all the unpleasant odour.

It should be especially noticed that in making preparations of eucalyptus leaves, the narrow, somewhat sickle-shaped ones which are obtained from the full-grown tree, should alone be used, as it has been proved that these are more efficacious than the broader leaves which are derived from the young plant.

Another popular use to which this now celebrated plant has lately been applied is to suspend a branch over a restless sleeper, or to place some leaves under the pillow, when it is said to produce sleep.

After numerous other illustrations of the products of the *Eucalypti*, Professor Bentley concluded by saying, that having given a general sketch of the properties and uses of the various species of *Eucalyptus* and more especially of those of *Eucalyptus globulus*; that when we regard the beauty of the different species, the proved influence of *Eucalyptus globulus* in destroying the pestilential character of marshy districts, and the numerous important economic and medicinal products which the Eucalypti yield, it must be admitted, after allowing for much exaggeration, that the genus was one of the most important to man in the vegetable kingdom.

NOTE ON THE WAX CONTAINED IN THE LEAVES OF ILEX PARAGUAYENSIS.*

BY P. N. ARATA.

When the solution obtained by exhausting *Ilex paraguayensis* with ether, or better with ether-alcohol, is treated with lime, filtered and evaporated, it leaves a fatty residue, resembling wax. It was freed from chlorophyll by treating its ethereal solution with animal charcoal; the ethereal solution was then agitated with water, to remove caffeine and other substances, and on evaporation left the pure waxy matter. When boiled with an aqueous solution of potassium hydrate, this was partly dissolved, leaving a residue soluble in ether, and much more butyraceous than the original substance. This was separated by treatment with alcohol into an insoluble portion, transparent, and of a yellow colour, and a soluble portion, which is white, and melts at 55° C.

On neutralizing with hydrochloric acid the alkaline solution obtained by saponification of the wax, a white precipitate is produced, which has acid properties, and is soluble in ether and in boiling alcohol. It melts at 105—110°, and has a density of ·8151 at 26°. From the results of the analyses it does not appear to belong to the acetic series, but its molecular weight is very high. The author proposes to call it *mateeric acid.*

* *Gazzetta chimica italiana*, vii., 366—369.—From the *Journal of the Chemical Society*, April 1878.

The Pharmaceutical Journal.

SATURDAY, MAY 4, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE COUNCIL REPORT.

THE month of May, which brings with it a general aspect of revival in external nature, and a stimulus to encounter the labours of human life, is a period at which similar influences are exercised in regard to pharmaceutical affairs, for it is not only the time at which various agreeable reunions take place, but what is even more important, the time when the executive body, which may be termed the Parliament of Pharmacy, is to a great extent reconstituted and empowered to carry on for the ensuing twelve months the general government of the trade.

Within another ten days those members of the trade who possess the right to vote for members of Council will have been called upon to exercise that privilege, and by so doing to contribute their share towards the realization of the objects for which the organization of pharmacy was attempted by the formation of the Pharmaceutical Society and by the passing of the Pharmacy Acts. It will be no news to our readers that on the present occasion the system of issuing addresses to the electors has been carried out more extensively than has hitherto been the case when the only opportunity of taking this course was obstructed by considerations of "tariff." Another medium has now appeared in the shape of the Birmingham Association, the latest development of pharmaceutical organization, and a number of prominent members of this body have undertaken to relieve electors from the trouble of judging for themselves whom they should vote for by nominating three out of the fourteen candidates who have to be elected.

We do not pretend to question the propriety of this course any more than we question the desirability of the individual elector knowing something of the opinions and business qualifications of the candidates he votes for, and looking back to the past we venture to hope that one result of the system which is becoming more general will be that of exciting greater interest in the election of the representative body. Hitherto there has been great reason for regret that the number of votes recorded is far from being so large as it should be in proportion to the number who have a right to vote.

In some quarters also further benefits are anticipated to result from the electioneering influence which the Birmingham Association aspires to exercise, and we understand that many entertain a hope that the winter of their discontent may be made glorious summer by this agency.

In addition to the addresses of candidates for election as members of Council there are at the present time being issued several other documents which call for the attentive consideration of all who desire to exercise their functions as electors. First in importance among these may be mentioned the report of the Council, a printed copy of which will be sent with this number of the Journal to every member of the Society and to every associate in business, numbering between three and four thousand. The subjects it treats of as having been under consideration during the past year comprise many of importance to the trade, which we will briefly recapitulate. First it shows that the financial position of the Society is increasing in strength. As regards the examinations there has been an increase in the number of candidates for various grades, which does not confirm the apprehension entertained by some that these examinations operate as a barrier to those who would enter the trade, and though the considerable number of failures to pass have been a subject for regret they do not appear to have been inconsistent with a due regard to that primary "trade interest," the maintenance of a fit standard of competence.

The Library, the Museum, the Evening Meetings of the Society and the attendance upon the classes of the School of Pharmacy are all represented in the report as presenting evidence of satisfactory progress, and the efforts of students to avail themselves of these opportunities for improvement have been as marked as their general good conduct.

In the retrospect of legislative matters affecting pharmacy mention is made of the successful action of the Council in obtaining the withdrawal of the Medical Act Amendment Bill during the last session of Parliament and in securing in the present Bill the absence of any provisions injurious to chemists and druggists. This and the equally successful result of the objections made by the Council to the proposed restriction of dental practice show that the Council has rendered substantial service in the protection of "trade interests," while in regard to the abnormally stimulated action of the Society of Apothecaries in opposition to "counter practice" by chemists and druggists, the Council, while adhering to the principle that the Pharmaceutical Society should not encourage the practice of medicine by its members, has obtained from the Society of Apothecaries a satisfactory assurance that simple counter practice by chemists and druggists will not be interfered with.

In the enforcement of the provisions of the Pharmacy Act it has generally been found unnecessary to incur the expense of legal proceedings inasmuch as the discontinuance of the offences complained of has been secured by simpler means.

The possible need of amendments in the Pharmacy Act has engaged the attention of a standing Committee of the Council during the past year, and its report has been accepted as a basis for action when a suitable opportunity offers.

Among the legislative matters which are still undecided, attention is drawn in the report to the Weights and Measures Bill as being of considerable importance to the trade, and the female question is mentioned as likely to come before the annual meeting of the Society.

Lastly the work of the Council in reference to the Benevolent Fund is summarized, and we regret to find that there is still occasion to point out that though all chemists and druggists on the register are eligible to receive aid in case of need, the number contributing to the Fund bears a very small proportion to the number on the register.

THE PRELIMINARY EXAMINATION.

THOSE of our readers who have taken an interest in the recently revived discussion respecting the Preliminary examination will do well to read an extract from a report made by the examiner who conducted the Society's last Preliminary examination on behalf of the College of Preceptors, which is printed on p. 872. It will be found that while not quite devoid of subjects for congratulation, it also makes clearly manifest some of those baleful influences against which examiners have to contend.

It will be seen, for instance, how the limitation of the area from which the Latin excerpts for translation are to be drawn appears to foster "cram" in its very worst form. It has been argued that this opprobrious epithet is often unfairly applied to the acquisition of information which is valuable in itself, and this may perhaps be admitted, with the qualification that the object sought being the ability to answer certain expected questions, the information has a superficiality that robs it of much of its value, whilst the proceeding being generally tainted with an intention to deceive is therefore demoralizing. But when a man who is to be tested in his knowledge of a language commits to memory beforehand somebody else's translation of the possible test passages, trusting that some feature in the one chosen will enable him to recognize it and quote from memory the appropriate translation, not only is the information acquired of no practical service, but the proceeding becomes increasingly demoralizing and dishonest. It has been suspected that the occasional superiority of the translation compared to the answers to the grammatical questions might find an explanation in this way, and this is confirmed by the fact that, as in the ludicrous illustration given, sometimes when what may be termed a colourless passage is given, the candidate fails to find his clue and is betrayed into giving a translation of another part of the book.

Another painful subject referred to is that in several instances there have been indications of copying, and in one case this has amounted to a certainty which appears to have been appropriately dealt with by the Board of Examiners. It is one disagreeable fact that young men seeking to enter an honourable calling should act dishonourably on its very threshold; it is another to find that gentlemen who, in consequence of the possibility that such action may be attempted, undertake duties of supervision do, in some cases, so far neglect them as still to leave the temptation in the candidates' way.

As has before been intimated, arithmetic is *the* weak subject, more than 75 per cent. having failed to answer rightly a simple question; not one on the metric system, which some think to be the chief stumbling block, but one given to test accuracy of work.

It is, however, a pleasure to find that compared with three previous occasions, there has been marked improvement in all three subjects. Nor do we think at all unsatisfactory the result from the unexpected, and perhaps somewhat unwarranted, introduction of sentences to be retranslated into Latin.

ARSENICAL VIOLET POWDER (?).

WE have watched with no little interest during the last two weeks for the appearance of some report in the daily papers of proceedings against the sellers of arsenicated violet powder, who, to judge from the statements that have appeared in the *Lancet*, and in some other papers, are neither few nor far between. But though the public was positively assured that numerous deaths of children in the neighbourhood of London were attributable to the application of violet powder containing arsenic, and though this inference was glibly accounted for by the fact that white arsenic is cheaper than starch, we have been unable to learn that any prosecution has been instituted against persons for the sale of such an abominably adulterated article. This circumstance would seem to indicate a very reprehensible degree of negligence, for the statements made in the *Lancet* of the 20th of April, convey the impression that there was even then no lack of knowledge of such details as would be sufficient to justify a prosecution. In the editorial paragraph referring to this matter in our medical contemporary, it is unreservedly stated that "a very serious and extensively fatal series of instances in which poisoning has resulted from the unsuspecting use of powder publicly sold as harmless and proved to contain arsenious acid, has occurred near London," and if there be any adequate grounds for such an alarming statement we are at a loss to conceive why they have not been made use of in a more legitimate manner to put a stop to such an evil as is alleged to exist than by the mere publication of a vague sensational paragraph. We are equally at a loss to reconcile with the words we have quoted the concluding passage of the sentence in the *Lancet's* paragraph, to the effect that this alleged adulteration "is now under official investigation."

As the matter stands it would be out of place to enter into any argument as to the probability of such an article as white arsenic being used to adulterate violet powder, but we must protest against the disregard of public duty manifested by those who profess to be in possession of the evidence that would suffice for the punishment of offenders against the law and for the preservation of the public from a serious danger.

BOTANICAL LECTURES AND DEMONSTRATIONS AT THE GARDENS OF THE ROYAL BOTANIC SOCIETY.

IT will be seen by reference to the advertisement of the School of Pharmacy of the Pharmaceutical Society of Great Britain, that Professor BENTLEY will commence his course of lectures and demonstrations on systematic and practical botany, at the Gardens of the Royal Botanic Society, in the Regent's Park, on Saturday morning, May 11, at 8 o'clock. These lectures will be continued on the succeeding Friday and Saturday mornings till the end of July.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, May 1, 1878.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present — Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Gostling, Greenish, Hampson, Hills, Owen, Robbins, Sandford and Shaw.

The minutes of the previous meeting were read and confirmed.

Professor Bentley's Lecture.

The President. having referred in eulogistic terms to the lecture lately delivered by Professor Bentley on *Eucalyptus globulus*, moved—

"That the best thanks of this Council be given to Professor Bentley for the lecture on *Eucalyptus globulus* which he delivered to the Society on April 17th last.

The Vice-President seconded the motion, and Mr. Sandford supported it, speaking in very high terms of the lecture.

The motion was carried unanimously.

Elections.

MEMBERS.

Pharmaceutical Chemists.

Barrow, Frank Arthur ....Dullingham.
Bayston, George Coryndon ......South Kensington.
Brown, George German ....Great Malvern.
Collinson, Frederick William...Alnwick.
Greenhill, Samuel Osborne ......Colchester.
Greenough, Hugh Fairhurst ...Warrington.
Hutton, Harry ....Compton Verney.
Heywood, John Henry............Lincoln.
Mead, Charles John...............Burnham.
Radford, Charles ....Sutton-in-Ashfield.
Rohan, Robert Aldor ....Mauritius.
Stephenson, George Herbert ...Beverley.
Tompsett, Leighton Stovold ...Bexley Heath.
Vernon, William Henry ....Derby.

Chemists and Druggists.

Douglas, Alexander ....Dunblane.
Gordon, William ....Aberdeen.
Rendle, Richard Hosking ......Ivybridge.

ASSOCIATES IN BUSINESS.

The following having passed their respective examinations, being in business on their own account and having tendered their subscriptions for the current year were elected "Associates in Business" of the Society:—

Minor.

Bell, John Waller ....Todmorden.
Bennett, Henry Charles ....Portwood.
Brasnett, Robert John............Erith.
Brumwell, William Preston ...Gateshead-on-Tyne.
Cattell, John Thomas ....Birmingham.
Clegg, Edmund.....................Eccles.
Crang, Walter ....Ilfracombe.
Edwards, George ....London.
Green, George ....Alford.
Hargreaves, Joseph ....Warrington.
Hodgson, Ralph ....Balham.
Holding, John ....Barnsbury.
Holmes, James Williams.........Hull.
Howe, Oliver George ....Liverpool.
Jones, William Nathanael ......Stoke Newington.
Law, Alfred ....Chelsea.
Lloyd, Rees ....Penyraig.
Marsh, William Henry ....Holloway.
Mence, William Cookes ....Surbiton.
Minett, Thomas Samuel ....London.
Mumford, Richard ....Cardiff.
Munday, John ....Bridgnorth.
Neale, Edgar........................Chippenham.
Ordish, Thomas .... New Normanton.
Richardson, George ....Hexham.
Ridley, Edward Henry ....London.
Smith, Robert Frazer ....Whiteinch.
Stubbs, Edwin ....Hull.
Thomas, Henry James ....Landore.
Vincent, Philip, jun. ....Fulham.
Warburton, William..............Ramsbottom.
Warrell, Edmund ....London.
Williams, Alfred Joseph ....Landport.
Wood, Henry.....................Gateacre.

Modified.

Batting, Thomas Gilbert.........Tunbridge Wells.
Bell, Matthew Whitelock ......Wandsworth.
Bradshaw, Charles Henry ......Hackney.
Brunton, William Walker ......Kensington.
Coates, George ....Halifax.
Jenkins, David......................Bridgend.
Pape, Tom..........................Helmsley.
Ramsey, Joseph ....Northwich.

ASSOCIATES.

The following having passed their respective examinations and tendered their subscriptions for the current year were elected "Associates" of the Society:—

Minor.

Aston, Walter ....Tarporley.
Barrat, Reuben......................Kingston-on-Thames
Bevan, William ....Ipswich.
Blaymire, Thomas Croskell......Kendal.
Bosher, Alexander ....London.
Broadhead, Richard...............Levenshulme.
Chalmers, John......................Newport, Salop.
Clayton, Christopher ....Caistor.
Cole, Samuel John ....Exeter.
Davies, John.........................Newcastle Emlyn.
Dawson, George Robert ....Southend.
Donaldson, James ....Edinburgh.
Glaisyer, Edmund ....Brighton.
Gravill, Edward Day ....Gainsborough.
Grimble, Albert ....Boston.
Holmes, Charles Newman ......Battersea.
Hunt, George ....Landport.
Hutton, William ....Portobello.
Jennings, Francis Rice ....Falmouth.
Jones, Charles Alfred ....Birkenhead.
Jones, Henry Stevens, jun.......Fulham.
Kent, Benjamin John ....Boston.
Leigh, Marshall ....Middlesborough.
McConnal, Alan ....Dudley.
Madeley, Edward Stanbury ...Barnes.
Metcalfe, John......................Bedale.
Nicholson, Charles ....York.
Parker, Thomas ....Preston.
Richards, William ....Nottingham.
Sadler, William, jun. ....Margate.
Sangster, John Graham ....Southsea.
Skelton, Thomas ....Maryport.
Sutcliffe, George Hargreaves ...Bacup.
Thomason, Thomas Watson ...Birmingham.
Walker, Charles Joseph ....London.
Whitrod, Henry Frederic ......Diss.

Modified.

Garrett, James Oliver ....Newport, Mon.

APPRENTICES OR STUDENTS.

The following having passed the Preliminary Examination were elected "Apprentices or Students" of the Society:—

Aspell, John Stanley	Douglas.
Baker, William	Leicester.
Barlow, Charles	Prescot.
Bennett, William	London.
Blachford, Jem	Bournemouth.
Blyth, William Brew Adam	St. Andrews.
Brown, Walter Howard	Halstead.
Bryant, Richard William	Swansea.
Coates, Udolphus Aylmer	Walsall.
Cooper, Frank Peacock	Nottingham.
Cotton, John	St. Helens.
Crowther, William Fearne	Beverley.
Davies, Arthur William	Hay.
Forret, John Alexander	St. Andrews,
Giddings, Alfred	Lancaster.
Grover, Sydney	Lower Norwood.
Hansford, Charles	London.
Hedley, Charles Alfred	South Shields.
Jeacock, Frederick Dawson	Alcester.
Job, Andrew Theaker	Clapham.
Joy, Francis John Jessopp	Cardiff.
Kennish, Thomas Looney	Whitehaven.
Kershaw, William Henry	Sale.
Lessel, Robert James	Dunecht.
Loxton, Frederick William	Dudley.
Marshall, Arthur Willis	Rusholme.
Miller, John	Strood.
Milne, Andrew Miller	London.
Monkton, George Joseph	London.
Ogden, Alfred	Radcliffe.
Parkes, Harry Charles	Fareham.
Phillips, John James	Hyde.
Pritchard, Edward Thomas	South Norwood.
Sankey, Joshua	Wellington.
Scowcroft, James	Bolton.
Shaw, Alfred James	London.
Smith, Albert Edward	Sudbury.
Smith, Arthur William	Redditch.
Soutter, James	York.
Stephens, David	Huddersfield.
Taylor, Henry	Stockport.
Walker, Benjamin	Yarm.
Wallace, John	Kelso.
Weatherley, Arthur	New Barnet.
Wildgoose, Thomas Downing	Dronfield.
Williamson, Henry	South Shields.
Willoughby, Arthur John	St. Leonards.
Worsley, William	Wigan.
Wride, Francis Blake	Shirley.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

The name of the following person was restored to the Register of Chemists and Druggists:—

William Briggs, 241, Jamaica Level, Bermondsey, S.E.

CONVERSAZIONE.—REFRESHMENTS.

The PRESIDENT informed the Council that since the last meeting of the Conversazione Committee the refreshment contractor at the South Kensington Museum had intimated that he should not open his refreshment rooms on the occasion of the conversazione unless the old plan were reverted to of paying a fee of one shilling per head for every person who entered the building. He had, however, offered the use of the refreshment room to any other contractor, but not of the kitchen arrangements. It seemed to him a question whether the Council should make an announcement that owing to circumstances not under its control no refreshments could be supplied, or whether the Lords of the Committee of Council on Education should be written to representing the inconvenience which would arise from this determination on the part of the contractor. It was now too late to abandon the conversazione, as the tickets had been issued.

A long conversation ensued, in which the opinion was unanimous that the Council should adhere to the principle it had already laid down, not to submit to what appeared to be an unjustifiable demand, and which course there was every reason to believe would be supported by other societies.

Ultimately it was resolved unanimously, on the motion of Mr. SANDFORD, seconded by Mr. BETTY—

> "That intimation having been given by the purveyor of refreshments at the South Kensington Museum that he will not open the refreshment room on the occasion of the conversazione unless a fee of one shilling per head be paid by the Society for each visitor entering the museum, the Council determine to hold the conversazione irrespective of this intimation."

It was further decided that the Committee should make the best arrangements possible under the circumstances.

REPORT OF THE BOARD OF EXAMINERS.

April, 1878.

ENGLAND AND WALES.

	Candidates. Examined.	Passed.	Failed.
Major, 10th	7	5	2
„ 11th	7	4	3
„ 16th	7	5	2
	— 21	—14	— 7
Minor, 10th	16	13	3
„ 11th	21	14	7
„ 12th	26	15	11
„ 16th	19	8	11
„ 17th	24	7	17
	—106	—57	—49
Modified	5	3	2
	132	74	58

SCOTLAND.

	Examined	Passed	Failed
Major	1	1	0
Minor	14	8	6
	15	9	6

PRELIMINARY EXAMINATION.

Candidates.

Examined.	Passed.	Failed.
324	181	143

Ten certificates received in lieu of this examination:—
5 College of Preceptors.
2 University of Cambridge.
1 University of Durham.
1 University of Oxford.
1 Faculty of Physicians and Surgeons of Glasgow.

EXTRACT FROM THE EXAMINER'S REPORT TO THE DEAN OF THE COLLEGE OF PRECEPTORS.

"I am pleased to be able to state that as compared with the work at these Examinations that has on previous occasions come under my notice there is a marked improvement in all three subjects; there are more papers that may be distinguished as very good, fewer as very bad, and the general average is higher.

"The Arithmetic is still the weak subject, and it is surprising to find how large a proportion (more than 75 per cent.) fail in a simple question given to test accuracy of work.

"It has sometimes been exceedingly unsatisfactory to have to award to a candidate for his perfect translation of the passage from Cæsar full marks, when his faulty answers to the grammatical questions have led one to suspect that he simply committed the English to memory and two or three words with which he has been familiar have given him the clue to the passage. Sometimes, indeed, a candidate fails to recognize the lines selected, and gives an excellent rendering of another portion of the book. An example of this occurs at this examination, when ———, a candidate from ———, gives this translation:—

Latin.	*English.*
"Nam etsi sine ullo periculo legionis delectæ cum equitatu prœlium fore videbat, tamen committendum non putabat, ut pulsis hostibus, dici posset eos ab se per fidem in colloquio circumventos.	"All these differ among themselves in language, in institutes and in law. The river Garum divide the Gauls from the Aquitanians and the Seine divide them from the Belgæ.

"To assist in detecting this cramming I this year introduced a question (5)* requiring three very easy sentences, translations from the Cæsar, to be re-translated into Latin; not with any idea of testing the power of the candidates to translate English into Latin, but to see how far they were acquainted with the construction of the Latin; and as this does not come strictly within the letter of the regulations I have taken care that no candidate has been prejudiced by imperfectly answering or even ignoring the question. The result has been exceedingly satisfactory; very few indeed have failed to attempt to construe these sentences, and about half succeeded very fairly.

"I regret to find that in several instances there are *indications* of copying, but as the evidence was not sufficiently clear to establish the case against them I have not thought it necessary to report the names, giving them the benefit of the doubt. But in one instance there is such clear evidence of copying and apparently of negligence on the part of the Superintendent that I have thought it my duty to draw your attention specially to it. The case is that of candidates ——— and ——— (the latter having copied from the former) of ——— where only two candidates were examined. I have set out in some detail the evidence of the copying for your satisfaction should any question arise with the authorities of the Pharmaceutical Society in connection with the case."

The PRESIDENT said everything tended to show that the Council would have to modify the system of centres. It was at the small centres, where only one or two candidates came up, that the irregularities occurred. He hoped that at the proper time the Council would see its way to make a change in this respect.

Mr. CHURCHILL thought superintendents might differ as to what would prevent copying, and therefore it would be well to define the distance which should separate the candidates.

THE DEPUTATION TO EDINBURGH.

A long and detailed report by the deputation from the Board of Examiners which recently visited Edinburgh was read, and it was resolved that the best thanks of the Council be given to the deputation for the same.

THE ANNUAL REPORT.

The annual report and financial statement as revised was adopted and ordered to be printed and circulated with the voting papers for the election of Council and Auditors.

* See before, p. 834.

REPORTS OF COMMITTEES.

FINANCE.

The report of this Committee, recommending sundry accounts for payment, was received and adopted.

BENEVOLENT FUND.

The report of this Committee included a recommendation of the following grants:—

£10 to the widow of an associate in business, having five children dependent on her.

£20 to the widow of a pharmaceutical chemist and life member. Applicant has eight children living, four entirely dependent upon her. The Secretary was also directed to suggest to the applicant the desirability of taking steps to procure the election of one of her children to an orphan asylum.

£5 to the daughter of a late annuitant.

£17 to the widow of a chemist and druggist, to be paid to a school in Belgium towards the education and clothing for one year of applicant's youngest child.

Mr. OWEN said he rather objected to the last item, inasmuch as if this were continued, as it probably would have to be, it would be a larger sum than had ever been paid by the Council in one case. He thought that it would be much better to get a child elected into an orphan asylum.

The PRESIDENT said this was only one way of distributing the Fund, and it appeared to him a very judicious mode of applying it.

Mr. OWEN said he had voted for the grant under protest, and he should be very happy if he were returned to the Council again to know that he might come before the Committee, and obtain an annual grant for the education of a child.

The PRESIDENT said every case should be treated on its own merits.

The report and recommendations were received and adopted.

LIBRARY, MUSEUM AND LABORATORY.

The report of this Committee included the Librarian's report, showing an average attendance in the Library for the previous month of 32 in the day; 13 in the evening. Circulation of books, in town, 166; country (23 places) 35. Carriage paid, 14*s.* 3*d.* He also reported the following donations to the library:—

'Proceedings of the American Pharmaceutical Association,' from the Association.

Cooley's 'Cyclopœdia of Practical Receipts.' 6th ed. Part 2. From the Publishers.

Payen's 'Industrial Chemistry.' Edited by Dr. B. H. Paul. From the Editor.

The Committee recommended the purchase of the following:—

General Fund:—

Thudichum and Dupré on 'Wine.'

Pasteur's 'Études sur le Vin.'

Mohr and Redwood's 'Practical Pharmacy' (to replace missing copy).

Hanbury Fund:—

Bentham and Mueller's 'Flora Australiensis.'

The Curator had reported the average attendance in the Museum to have been, day, 17; evening, 4. Also that the specimens exhibited at the last evening meeting, as well as a series of specimens illustrating the President's paper on "Salicylic Acid," had been presented to the museum. Also the following donations:—

Crystals of Biniodide of Mercury, from Mr. Mead; Fruit of Baobab Tree (*Adansonia digitata*); Root of *Pastinaca grandis*; Bulb of *Ledebouria hyacinthoides*; *Pachyma Cocos*; Chinese Insect Wax; Root of *Kæmpferia rotunda*; Root of *Valeriana Harwickii*; Root of Ammoniacum Plant; Chaulmoogra Seeds; and Oil Leaves (*Ricinus communis*), from M. Chantre; Cascarilla Moss

(*Parmelia perlata*), from Messrs. Hearon, Squire and Francis.

A letter had been received from the Rev. William Leay, M.A., Vicar of Downside, Bath, offering the Society for incorporation into the museum a collection of minerals brought by him from South America, forty years ago, and now lying in the British Museum. The Curator had been instructed to examine the specimens to see if they were suitable for the Museum.

The question of supplying reprints of papers read at the evening meetings had been further considered, and the Committee recommended that the authors of such papers, read either in London or Edinburgh, and published in the Journal, be each entitled to twenty-five copies of such papers, and that the Editor be instructed to supply them without waiting for application.

The Professors had reported favourably of their respective classes.

The Secretary had reported that he had received a copy of the Pharmaceutical Register of Victoria for the current year, and he had been instructed to thank the Honorary Secretary of the Society for the same.

Mr. Shaw said one portion of the minutes seemed to be a repetition of what took place last month with reference to the supplying of copies of papers read at London and Edinburgh. He then spoke in favour of the same privilege being extended to authors of papers read before provincial associations. He certainly thought the authors of such papers should have twenty-five copies if they requested them. Wherever a good active working association was in existence in the provinces, it should be enouraged as much as possible.

The President reminded Mr. Shaw that the question submitted to the Committee was confined to the papers read in London and Edinburgh. This was a different question, which Mr. Shaw was quite entitled to raise, but it must come before the Council separately.

Mr. Shaw said he was told on a former occasion that provincial associations would not be excluded, and if such were the case he should be satisfied. But he thought the Council might as well say yes or no at once to the very moderate request he was making.

Mr. Atkins said this matter arose out of a remonstrance by Mr. Mackay, who distinctly said he did not refer to provincial associations.

Mr. Betty was not aware that the subject of provincial associations was in question at all. He could as a member of the Committee assure Mr. Shaw that there was no desire to interfere with the privileges of country members.

Mr. Greenish said he understood Mr. Shaw simply to ask that any gentleman who read a paper at a provincial association, which was printed in the Journal, should be entitled, if he wished it, to twenty-five copies gratis. He thought this was a very reasonable request indeed, and if Mr. Shaw would bring forward a motion to that effect he would support him. If a paper were worth printing in the Journal it was worth giving copies of, and he would go further, and inform the authors what would be the cost of printing an extra number of the papers.

After some further conversation,

Mr. Shaw said he would let the matter rest for the present, and if it appeared necessary he would bring it forward at a future time.

The report and recommendations were then received and adopted.

HOUSE.

The report of this Committee included an estimate for the work to be done to the Society's premises during the recess, which the Committee recommended be adopted. It also recommended that certain additions to the furniture and fittings of the Editor's room be made.

The report and recommendations were received and adopted, and the Committee instructed to order such other work as was necessary.

LAW AND PARLIAMENTARY.

The report of the Committee included a letter from the Duke of Richmond, stating that the views of the Society with reference to the Medical Act Amendment Bill should receive his Grace's careful attention.

The Solicitor had sent his usual report of cases in hand, and several other matters relating to alleged infringement of the Pharmacy Act had been considered.

The Committee recommended that a letter, a draft of which was included in the report, should be sent to the President of the Medical Council, calling attention to the changes introduced into the Weights and Measures Bill, whereby the use of Apothecaries' weights and some of the Pharmacopœia measures would be rendered illegal, and even the possession of such weights and measures a punishable offence.

The report and recommendation were received and adopted.

The Sale of Vermin Killers.

The following communication from the Local Government Board was read by the Secretary—

"Local Government Board,
"Whitehall, S.W.,
"20*th April*, 1878.

"Sir,—I am directed by the Local Government Board to forward to you, for the information of the Pharmaceutical Society of Great Britain, the enclosed copy of a report recently forwarded to the Board, which was made by the public analyst for the borough of Penzance for the Michaelmas quarter of 1877.

"I am, sir,
"Your obedient servant,
"J. F. Rotton,
"*Assistant Secretary.*"

(Copy Report).

"Penzance Michaelmas Sessions, 1877.

"Report of the Public Analyst.

"To the Chairman and Magistrates of the borough of Penzance in quarter sessions assembled.

"Gentlemen,—I have to report that during the past quarter no samples of food, drink, or drugs have been brought me for analysis, under the provisions of the "Sale of Food and Drugs Act," from the borough of Penzance either by the police or the public.

"Although not strictly coming within the scope of my appointment, I would beg to call your attention to a matter of considerable importance which has come under my notice.

"On the 31st of July I received from a gentleman at St. Just, the body of a duck, one of nine which had died under very suspicious circumstances, and on analysing the intestines and contents, I found strychnine present.

"On the 28th August I received the stomach of a fine pig from the same gentleman, and in this I also found strychnine, which had no doubt been the cause of the animal's death.

"It appeared probable that this poison had been administered wilfully, and in order to discover the culprit I suggested that inquiries should be made of the druggists in Penzance as to who had purchased poisons within the last few months.

"This was done, but nothing could be learnt, since it appears the Penzance druggists are in the habit of selling vermin poisons containing strychnine without taking the names of the purchasers.

"I am informed that they do not sell arsenic without this precaution, which is ordered by Act of Parliament, but that the sale of mixtures containing the far more dangerous strychnine is practically unrestricted.

"Whether this is generally the case or not, I am unable to say, but I have felt it my duty to mention the facts related above.

"I am, gentlemen,

"Your obedient servant,

"J. H. COLLINS,

"*Public Analyst for the borough of Penzance.*"

To this communication the Secretary had written an acknowledgement, stating that he would bring the matter before the Council, and also calling attention to the 17th section of the Pharmacy Act, 1868.

Mr. SHAW said his practice always was to treat vermin killers, containing poisons mentioned in schedule 1, as requiring to be registered.

Mr. ATKINS said a serious charge was here brought against the whole body of chemists in Penzance. His friend Mr. Cracknell and himself were there together last summer, and found a considerable body of most respectable men carrying on business in that town, and he was hardly prepared to believe what was stated. There could be no doubt what their obligations were; they were called upon by law to register the sale of every vermin killer that contained strychnine, and to take the signature of the person to whom it was sold. That was personally, a matter of great inconvenience to him, particularly on market days, but he never allowed it to be omitted. Chemists and druggists were sometimes called upon to produce their registers to the police, as he had been only a short time since. He was surprised to hear such a sweeping assertion made that the whole of the chemists in Penzance were not in the habit of registering sales. He had heard in his neighbourhood of one or two men boasting they never did so, but the majority obeyed the law. He thought it was only right that this communication should be published in order that the chemists of Penzance might see what was said of them and have an opportunity of replying. With regard to arsenic chemists and druggists were placed in exceedingly difficult circumstances in the country. They registered all small sales of arsenic, but if a farmer sent for a half-hundredweight it was not the practice to require his signature, but to file his letter containing the order.

Mr. BETTY submitted that this report of a Penzance analyst had no *locus standi* before the Council at all. It was not the duty of the Council to respond to all these reports which were spread about. Here was a public analyst who had nothing to do, as he himself said, and who went out of his way to deal with matters not belonging to him, and send up a report that a pig and a duck had been poisoned. It was not just to pay attention to statements of that sort.

The PRESIDENT reminded Mr. Betty that the Local Government Board considered the communication of sufficient importance to send it on to the Council.

Mr. BETTY was sorry to find the Government thought it necessary to send the Council a report that a pig and a duck had been poisoned.

The PRESIDENT said the Government had sent the information that the druggists of Penzance were in the habit of selling poisons without registering the sales.

Mr. BETTY contended it was a vague charge without the slightest proof. His opinion was, the Council should send an answer to the effect, that any evidence of in-infringement of the Pharmacy Act would be considered by them, but that the Council could not take action without definite evidence. Supposing he said, "a great deal of crime prevails in London"; nobody could deny that, but it was not a statement on which any action could be taken.

The VICE-PRESIDENT said if he had a pig or a duck poisoned he should feel very indignant, and if he found that in the town he was living in the provisions of the Act of Parliament were not carried out, he should feel it his duty to look into the matter. That state of things had been represented to the Council, and he thought it ought to take some action so far as to intimate, if not directly to the chemists at Penzance, by publication in the Journal that such correspondence had taken place and pointing out the importance of complying with the Act of Parliament. After referring to a recent absurd report in the *Lancet* with regard to the adulteration of violet powder with arsenic, which had been copied into all the newspapers, and which in his own neighbourhood he had taken means to show the absurdity of, he said he thought there should be some notice taken of this communication.

Mr. HAMPSON thought the Council could not let the correspondence rest without an answer, but he understood the Secretary had already replied, as far as he could gather, very completely, to the effect that it lay in the hands of the police to discover and prosecute any breach of the law in this respect. He thought the discussion which had now taken place would of itself disseminate the information that certain accusations had been made, and no doubt that would call attention to the subject, which was all that was necessary.

Mr. CHURCHILL did not think it would be beneath the dignity of the Council to take proper notice of this matter. He thought it would be as well for the Secretary to write to the chemists at Penzance, saying that such a communication had been received, and asking for information. Unless something were done the public analyst might communicate with the police, which might make some of their brethren in Penzance feel extremely uncomfortable.

The PRESIDENT suggested that the Local Secretary be communicated with and his attention specially drawn to the report in the Journal.

Mr. GREENISH hoped this discussion would be published, so as to give the chemists at Penzance an opportunity of refuting the charge.

Mr. BETTY also suggested that a postscript should be added, that the Council would be glad to receive any reply the Local Secretary might make. He should be glad to get such a reply from Penzance, as it might be sent to the Local Government Board.

Mr. SANDFORD observed that the parties referred to might say they did not know the vermin powder contained strychnine. He himself never allowed these things to be sold without being entered in the poison register; but the sellers were not bound to know the composition of proprietary articles, and that might be mentioned in the answer to Mr. Rotton. There was evidence in the analyst's letter that these men did their duty in the matter of arsenic, and no doubt they would do so in the matter of strychnine also if they were aware of it.

Mr. ATKINS thought no chemist and druggist could plead ignorance as to the composition of Battle's vermin killer, for it had been mentioned repeatedly in criminal prosecutions, and Mr. Battle had himself given an intimation through the wholesale houses that it did contain strychnine and required registration. He should be perfectly content if this discussion were published in the Journal, as it would no doubt produce a reply, for he could scarcely believe the charge to be entirely true.

Mr. GOSTLING thought the subject should not be treated in the light manner in which Mr. Betty had dealt with it, but that the Local Secretary at Penzance should be communicated with. There was a certain amount of evidence, whether correct or otherwise, which had gone before the Government Department, and its truth should be ascertained. The Pharmaceutical Society was a body to which the safety of the public was committed in these matters, and he thought it was its duty when it heard a complaint of this kind to put itself in communication with the parties charged.

Mr. SHAW said the charge was uncorroborated, and under ordinary circumstances, the Council should not entertain it until it had more direct evidence. If it thought proper, the Local Secretary might be asked what was the practice, and if he should reply that it was the practice to enter the sales of these vermin killers, it would remove the onus from them; but otherwise he thought it would not be desirable to publish the matter in the Journal.

It was then moved by Mr. Cracknell, and seconded by Mr. Robbins :—

"That the communication from the Local Government Board be published in the Society's Journal, and that a copy of it be sent to each chemist in Penzance."

Mr. Bottle would much prefer that the chemists at Penzance should be communicated with through the Local Secretary before the matter was made public at all It seemed to him, upon the face of it, that the report was somewhat contradictory, because the public analyst said he had had no article of food or drug to analyse for a certain length of time. He did not know what views that gentleman held as to what was food, but in his neighbourhood they looked upon pigs and ducks as articles of food. His conviction was, that the vermin killer was used in its legitimate way, that the vermin were destroyed by its use, and that the pigs and ducks had swallowed the poisoned animals. He would move, as an amendment:—

"That the Local Secretary at Penzance be communicated with, with reference to this matter, before any public notice be taken of it."

Mr. Shaw seconded the amendment.

Mr. Hampson remarked that not long ago he saw an announcement on a bill of a proprietary article that vermin killer might be obtained through the post, so that it did not follow that the poison in question was supplied by a Penzance druggist.

Mr. Shaw said it might have been brought from London by a gentleman's gamekeeper, for large quantities of strychnine were used by that class of persons for the purpose of destroying weasels and other vermin which preyed upon game.

Mr. Betty saw no objection to the discussion being published. It was all very well to throw an accusation amongst them and then say they should keep it quiet. The moment it became a public accusation it was a public matter, and the parties charged should have an opportunity of rebutting the accusation. He did not think it at all probable that the Penzance chemists did not comply with the Pharmacy Act. He disliked an official wandering beyond his official office, and if the analyst had nothing to do, as he stated, he should not meddle with foreign affairs by making a sweeping charge. The least the Council could do was to make the affair as public as the act of a public man could make it, and give those whose conduct was arraigned every opportunity of publicly disclaiming it. If they were guilty, let them bear the blame, and if they were innocent let them show these public officials that they were not to throw dirt on members of the trade in that way. He hoped that the amendment would be withdrawn.

Mr. Sandford agreed that the discussion should be published, but he thought that the Council ought not to publish the letter until it had received permission from Mr. Rotton.

Mr. Gostling said the communication as soon as it was sent to the Society became public property.

After some further conversation, Mr. Bottle then withdrew his amendment and the motion was put and carried by a majority of seven to four in the following form:—

"That the communication from the Local Government Board be published in the Society's Journal."

Cochineal and Kino.

The Secretary then read a communication from the Colonial Office, enclosing one from the Secretary of State of the Bahamas asking information with regard to the preparation of cochineal and kino for export, and stated that the Curator had been instructed to make inquiries which he was now prosecuting.

Statute Law Revision.

The Secretary also read a letter he had received from the Statute Law Revision Committee, asking if any sections of the older Pharmacy Acts had now become obsolete. He stated that he would go carefully through the Acts and submit the results to the Law and Parliamentary Committee.

Meeting at Newcastle.

The Secretary also read a letter from the Local Secretary at Newcastle containing two resolutions which had been passed at a recent meeting of chemists in that town referring to the pending prosecution in relation to counter prescribing and to the labelling of proprietary medicines containing poison.

Notice of Motion for the Annual Meeting.

The Secretary read the following notice to be moved by Mr. Wade at the ensuing annual general meeting—

"That all persons being duly qualified (irrespective of sex) shall be eligible for admission into the Society in accordance with the bye-laws thereof, and this meeting is of opinion that ladies should not be excluded from participation in the privileges of the Society."

BOTANICAL PRIZE FOR 1879.

A Silver Council Medal is offered for the best Herbarium, collected in any part of the United Kingdom, between the first day of May, 1878, and the first day of June, 1879; and should there be more than one collection possessing such an amount of merit as to entitle the collector to reward, a second prize, consisting of a Bronze Medal, and also Certificates of Merit, will be given at the discretion of the Council. In the event of none of the collections possessing sufficient merit to justify the Council in awarding medals or certificates, none will be given.

Competitors must be Associates or Apprentices or Students of the Society, and under twenty-one years of age.

The collection must consist of phanerogamous plants and ferns, arranged according to the natural system of De Candolle, or any other natural method in common use, and be accompanied by lists, arranged according to the same method, with the species numbered.

The collector must follow some work on British botany (such as that of Babington or Hooker), and state the work he adopts. The name of each plant, its habitat, and the date of collection, must be stated on the paper on which it is preserved.

Each collection must be accompanied by a note, containing a declaration signed by the collector, and certified by his employer, or a pharmaceutical chemist to whom the collector is known, to the following effect:—The plants which accompany this note were collected by myself, between the first day of May, 1878, and the first day of June, 1879, and were named and arranged without any other assistance than that derived from books.

In estimating the merits of the collections, not only will the number of specimens be taken into account, but also their rarity or otherwise, and the manner in which they are preserved, and should a specimen be wrongly named, this will be erased from the list.

The collection must be forwarded to the Secretary of the Society, 17, Bloomsbury Square, on or before the first day of July, 1879, indorsed "Herbarium for Competition for the Botanical Prize." After the Prize Distribution in October, they will be retained one month, under the care of the Curator of the Museums, for the inspection of persons connected with the Society, and then returned to the collector, if required.

STATEMENT OF ATTENDANCE OF MEMBERS OF COUNCIL ON COMMITTEES FOR THE YEAR 1877-78.

	Committees held once a Month or oftener.		Committees held Occasionally.					
	Finance.	Library, Museum, and Laboratory.	House.	Benevolent Fund.	Law and Parliamentary.	General Purposes.	Special Committees appointed to draw up Reports, etc.	Total Number of Attendances.
Number of Committee Meetings held.	11	11	11	12	13	2		
Atherton (*Nottingham*)	*	*	*	4	3	0	0	7
Atkins (*Salisbury*)	*	*	*	*	0	0	0	0
Betty (*London*)	*	8	7	8	7	1	5	36
Bottle (*Dover*)	4	0	0	8	6	2	0	20
Brown (*Manchester*)	*	*	*	*	1	0	0	1
Churchill (*Birmingham*)	*	*	*	3	11	1	0	15
Cracknell (*London*)	8	*	*	*	2	0	0	10
Gostling (*Diss*)	*	*	0	7	6	1	0	14
Greenish (*London*)	11	11	11	12	13	2	5	65
Hampson (*London*)	*	5	5	*	10	2	3	25
Hanbury (*London*)	*	1	0	*	3	1	1	6
Hills (*London*)	*	9	4	*	5	0	1	19
Mackay (*Edinburgh*)	*	*	*	*	2	0	0	2
Owen (*London*)	8	*	*	8	4	1	0	21
Rimmington (*Bradford*)	3	*	*	3	4	1	0	11
Robbins (*London*)	8	8	8	10	8	1	1	44
Sandford (*London*)	*	8	7	2	8	1	2	28
Savage (*Brighton*)	11	2	2	11	11	2	2	41
Schacht (*Clifton*)	*	*	0	*	6	0	0	6
Shaw (*Liverpool*)	*	*	*	5	5	1	0	11
Williams (*London*)	0	10	10	11	12	2	5	50

* Not appointed on this Committee.

NUMBER OF ATTENDANCES OF MEMBERS OF COUNCIL AT COUNCIL MEETINGS FOR THE YEAR 1877-78.

Atherton, John Henry	5	Gostling, Thomas Preston	11	Rimmington, Felix Marsh	7
Atkins, Samuel Ralph	10	Greenish, Thomas	12	Robbins, John	10
Betty, Samuel Chapman	12	Hampson, Robert	11	Sandford, George Webb	11
Bottle, Alexander	10	Hanbury, Cornelius	8	Savage, William Dawson	12
Brown, William Scott	2	Hills, Thomas Hyde	11	Schacht, George Frederick	8
Cracknell, Charles	9	Mackay, John	4	Shaw, John	10
Churchill, Walter John	12	Owen, John	9	Williams, John	11

Number of Council Meetings during the year, 12.

NORTH BRITISH BRANCH, EDINBURGH.

Annual Meeting.

The annual meeting of the North British Branch of the Pharmaceutical Society was held in the Society's Rooms, 119A, George Street, on Friday, 26th April, at 12 o'clock. Mr. J. B. Stephenson, President of the Branch, in the chair.

The President opened the meeting by asking the Honorary Secretary to read the—

Annual Report.

The Council of the North British Branch beg now to submit, as usual, the report of the proceedings of the Society in Edinburgh for the year 1877-78.

The operations and work of the Society continue to be carried on in the same rooms, and with equal satisfaction. Much inconvenience, however, is felt from the want of accommodation, which is gradually becoming more inadequate. Another room is urgently required in connection with the examinations, while nearly all the available wall-space is already occupied by the museum and library.

The rooms are still much frequented by candidates preparing for the Major and Minor examinations, and the arrangements made for these purposes are taken advantage of to a considerable extent. Attendance: day, 749; night, 313; total for the year, 1062; from the opening of the rooms, 5265.

With the concurrence of the London Council, opportunities have been afforded during the winter, by which two medical societies have been accommodated, one for monthly evening meetings and the other for occasional examinations. This arrangement has been found, however, to act prejudicially as regards pharmaceutical students and otherwise, and the Edinburgh Council have under their consideration the propriety of discontinuing it, and of reserving the rooms exclusively for the requirements of the Branch after the close of the present session. The London Council will, of course, be communicated with on the subject, and sufficient reasons given for asking them to concur in the view now proposed by the Council in Edinburgh.

The museum has had several presentations both of value and interest during the past year. Notably may be mentioned a stuffed musk deer from Mr. Howden, of Gracechurch Street, London, as well as several specimens of native drugs and other articles from Mr. Jamie, Singapore, who has in the same way on many previous occasions shown his warm interest in the progress of the Society in Scotland.

The library has also been enriched by the addition of a few valuable volumes, and the books are now taken advantage of to a fair extent. Number of books taken out during the year, 123.

The number of candidates presenting themselves for examination in Edinburgh during 1877, was as follows:—Preliminary, 49; Minor, 94; Major, 4; Modified, 8. The percentage of failures in the three latter was 33·5. The total number of examinations in Edinburgh was 13, of which 4 were Preliminary.

The special tickets issued by the Honorary Secretary to pharmaceutical students for full courses of chemistry, botany, and materia medica, were 19. It must be remembered that there were no separate courses in connection with pharmacy during the past session, and students were therefore left to the ordinary university and other lectures.

Very much has been said, and not a little written, about the continued large percentage of failures, not only in the Preliminary but also in the other examinations. The Council do not altogether concur in the outcry regarding the stringency of the first or classical examination. They think the questions, as put by the College of Preceptors, are, on the whole, fair and reasonable, and such as no duly educated lad should fail in answering. They believe, however, that the questions with relation to the metric system are probably one of the stumbling blocks with some of the defeated candidates, as this system has hardly yet taken its place in the ordinary course of education, at least in Scotland, and they further believe that when it does so take its place, which it is rapidly doing, the cause of complaint will disappear.

Regarding the remarks made as to the difference in the examinations between the London and Edinburgh Boards, the Council are glad to report that Edinburgh was recently honoured by a joint deputation from the London Council and Board of Examiners, and as those gentlemen remained in the rooms, and witnessed the whole system pursued by the examiners in Scotland, they had every opportunity of comparing notes, and forming an opinion, and it is believed they are satisfied that the very closest resemblance exists in the conduct of the examinations as carried on in London and Edinburgh.

The scientific meetings have been six in number, and the Council beg to thank those gentlemen who have so ably contributed papers on these occasions. It has afforded much satisfaction to find that all the meetings were well attended. A new feature in connection with one of them was an invitation from Professor Archer, of the Museum of Science and Art, to assemble in the Museum, where a very pleasant and instructive evening was spent, a notice of which appeared in the Journal.

The Council are glad to find that the Society has taken action in more than one instance of illegal trading in poisons. They are also pleased to know that there is every prospect of what may be called "legitimate prescribing" remaining undisturbed. They feel that while it may be a right and proper thing to discountenance medical and general practice by those who cannot be presumed to possess the requisite qualifications, yet it would militate very much against the interest of chemists, and be also a somewhat serious matter to the general public, if chemists were debarred from giving across the counter any simple medicine to relieve such cases as almost every hour of the day present themselves, and this seems to be the feeling of the apothecaries themselves, and the Council have the confident assurance that our Society will be prompt in resisting any uncalled for interference, by medical defence or other associations, with the legitimate position of dispensing chemists and druggists.

No new Bill has been applied for with the prospect of success, which had any clause considered antagonistic to the working of our Pharmacy Act. One or two such attempts have been made, but they may be only thus incidentally alluded to, as in every case representations made by the Society in London were at once responded to, and the objectionable clauses expunged, or the Bill itself withdrawn.

A Parliamentary Committee sits from time to time in Bloomsbury Square, and the Council here feel that it is not likely to overlook any opportunity which may occur to improve or extend the operations of the Pharmacy Act.

The same system in regard to the election of Council, and which has given satisfaction for a year or two back, has again been followed on this occasion, with the additional precaution of communicating direct with the nominees, so as to get from them a written concurrence to act in event of election.

Since this report was drawn up, the Council regret to learn that the select Parliamentary Committee on the Weights and Measures Bill have reported in favour of discontinuing the permission now granted to chemists to use the *scruple* and *drachm* weights. If this view is embodied in the Bill it will render illegal not only any sale effected by these weights, but also the mere possession of them, and even the use of the terms in any form whatever. The great inconvenience of having no intermediate denomination between the grain and ounce will be obvious at once, and it may be remembered that it was the practical experience of this that led the Medical Council in the 1867 edition of the Pharmacopœia to withdraw the prohibition of these weights, which they had laid down in the first edition of that work. The Council observe that the Parliamentary Committee of the Society in London have had their attention directed to the subject, and they cannot doubt but that, when representations are made in the proper quarter, the threatened interference will be averted.

Mr. Kinninmont in a few remarks expressed his sympathy with the paragraph in the report referring to the Weights and Measures Bill, and he was followed in the same strain by Messrs. Stephenson, Kemp and Mackay.

Mr. Gilmour commented on the examinations with particular reference to the questions put at the Preliminary examination, and while he expressed himself generally satisfied still he thought that some of the questions were not stated in a sufficiently distinct manner.

Mr. Young followed Mr. Gilmour on the same subject.

Mr. Mackay suggested that as Mr. Gilmour was one of the deputation appointed to be present at the examinations in London, in June, he thought *then* would be the proper time to get the matter thoroughly discussed.

Mr. H. C. Baildon moved the adoption of the report; the motion was seconded by Mr. Blanshard, and carried.

The Chairman then laid before the meeting the result of the voting for the new Council, which was tabulated in such a way that the audience could see at a glance the relative number of votes recorded. The following gentlemen had the highest numbers and were duly elected as Council for 1878–79 (the names are given alphabetically):—

Mr. William Ainslie	Edinburgh.
Mr. H. C. Baildon	„
Mr. George Blanshard	„
Mr. James Buchanan	„
Mr. Thomas Davison	Glasgow.
Mr. Daniel Frazer	„
Mr. Alexander Govan	St. Andrews.
Mr. William Gilmour	Edinburgh.
Mr. David Kemp	Portobello.
Mr. Alexander Kinninmont	Glasgow.
Mr. Alexander Napier	Edinburgh.
Mr. Alexander Noble	„
Mr. A. Seath	Dunfermline.
Mr. J. B. Stephenson	Edinburgh.
Mr. James R. Young	„

The Chairman said that 196 voting papers had been issued, and of these 93 were replied to. One paper was rejected as informal.

On the motion of Mr. Gilmour, Mr. J. B. Stephenson and Mr. A. Napier were unanimously re-elected as President and Vice-President.

Mr. Mackay was unanimously re-elected Honorary Secretary.

The following gentlemen were appointed Auditors for the year:—Messrs. Stephenson, Napier and Young.

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

Annual General Meeting.

The annual general meeting of this Association was held in the Manager's Library of Anderson's College, on Wednesday, the 1st inst. Mr. Daniel Frazer, President, in the chair. After the usual preliminaries had been gone over, the Secretary was called upon to read the annual report, of which the following is an abstract.

The report, in briefly referring to the work of the Association for the current session, stated that during the last summer a botany class, under the auspices of the Association, was conducted by the late lamented and talented Professer Keddie, F.R.S.E., for which 22 enrolled as members. For this summer, it has not been seen fit, owing to the many advantages already enjoyed in the city, to organize a subsidized botany class, but to recommend the one now and for so long carried on in connection with the Andersonian College.

The following classes were conducted during the winter months:—

Tutorial class opened November 12, and conducted two nights per week, by Mr. Archibald Fairlie, C.M., for which 26 entered, the average attendance being 14.

Theoretical chemistry, opened November 13, met once a week, conducted by Dr. Milne, 16 entered for this class, average attendance 8; 13 of these enrolled for the—

Practical chemistry class, also conducted by Dr. Milne, one night per week, the attendance at which was regular.

The library has, during the session, been largely patronized. The following books have been presented by the Council of the Pharmaceutical Society: 'The Calendar,' and the 'Catalogue of the Museum of the Pharmaceutical Society;' and one copy weekly of the *Pharmaceutical Journal*; the *Chemist and Druggist*, by the Proprietors; 'Year-Book of Pharmacy;' Hanbury's 'Science Papers' and 'Pharmacographia,' by the Executive of the Pharmaceutical Conference; and by Dr. Christe his exhaustive work on 'Cholera Epidemics in East Africa,' for all of which the thanks of the Association are due.

The price list committee have, during the session, made what slight alterations the fluctuations of the market demanded, and which have been generally adopted by the trade, but it is earnestly recommended that all should, as far as possible, adhere to the retail price list, which would tend to the mutual advantage of all, and avoid complaints on the part of the public.

The early closing committee, though at their work, have not yet fully accomplished their objects, and particular attention is drawn to their desire of uniformity of hours, the late hours observed by some neither tending to benefit themselves, the trade, nor the public.

The Council regret the loss of Mr. J. L. McMillan, secretary, and Mr. James Murdoch, librarian, owing to both having left the city last autumn; their places were filled by Mr. John Walker and Mr. W. McKenzie respectively.

In accordance with a resolution passed in November last, the Council of the Pharmaceutical Society was approached with reference to the high percentage of failures in Preliminary examinations, the burden of the reply to which may be found reported in the Journals for December. It is believed by the Executive of the Association that good has been effected by directing the attention of the trade throughout the country to this matter.

The thanks of the Association are due to the various gentlemen who have forwarded donations, some of whom had thus showed that though they, for various reasons, do not attend the general meetings, they are nevertheless interested in the Association.

From the Treasurer's statement, it was shown that though the income has not been quite up to last year's, the expenditure has not exceeded it, thus leaving the exchequer in a favourable state.

The lectures (without going over each) have been both interesting and highly instructive, and the report expressed a hearty appreciation of the kindness of each and all the lecturers; but stated that it is matter for regret that there should be such difficulty in getting the members to take an active part in the monthly meetings. Another matter, and perhaps greater discouragement has been the poor attendance at most of these meetings. The Council feel strongly on this matter, because having asked eminent gentlemen, outside the Association, to be at the trouble of preparing papers, when these gentlemen came to deliver them, it was felt to be, to say the least, rather discouraging that so few members should attend the meetings.

The reports having been adopted and other business discussed, The President (Mr. Daniel Frazer) read his Valedictory address as follows:—

Gentlemen,—The difficulty which certain high dignitaries of the country experience at this moment of getting into fisticuffs with their real or supposed enemy, that of not quite clearly seeing what they are to fight for or about, is a trifle to the difficulty I have had in fixing upon a topic to speak upon to-night. I have never been very good at erecting a man of straw for the mere fun of having the opportunity of knocking him down as soon as he was got on his legs; sometimes an ignoble, and always an easy task. That means, in this instance, that not knowing of any real object of interest to us pharmacists, *as pharmacists*, on which I could throw any new light, I have not attempted to conjure up a merely fanciful one with which I might needlessly have occupied your time. In fact I do not know a single pharmaceutical topic now under the horizon that has not already been threshed to very chaff.

For instance, you do not need me to tell you about the Trade Association. I wearied you almost to death on that subject at the beginning of last session, and you revenged yourselves upon me at your next meeting by unanimously acting in the very teeth of my opinions. Since then I do not know that anything new has occurred in regard to this Association. It is still, I believe, going on in the even tenor of its ways, and so also is the Pharmaceutical Society. My notions regarding these two societies remain precisely as they were eighteen months ago. I still think it a pity that any chemist and druggist should remain outside the original society. I still think that the members of the Trade Association who are not also members of the Pharmaceutical Society, should, where it is possible, become so, and so enjoy all the advantages offered by it as one of the legally recognized institutions of the land. Or, to quote from my address given in November, 1876—"Let the two really become one. Let them enter into the marriage relation now, and, becoming one, and with one governing and a truly representative head, the whole body, fitly joined together, will move on sweetly, and without a jar."

Then this "sale of patent medicines" question does not need discussion here. The letters and articles in our journals surely do not want to be supplemented by long speeches! On this subject all I venture to say is, there is little use in barking when you can have no possible hope of biting. The Government of this country most assuredly will not legislate merely to benefit us; it will not stop our neighbours selling articles they are quite as competent to sell as we are, any more than it will stop us selling articles just as foreign to our legitimate business as patent medicines are to the trade of grocer or of bookseller. I think, too, it is needless to be distressed about other folks selling them at a ruinously low price. That cannot last long. It will not pay them, any more than it will pay you or me, and if you leave them alone they will soon be glad to cast this sort of "physic to the dogs," and to be content with their own legitimate business. Meanwhile you keep up the prices at their makers' standard, and you will find yourselves winners in even this race—by and bye.

As to counter practice, I have still nothing new to add here to what I said when Professor Redwood addressed us on the subject in September, 1876. I never was afraid and am not yet afraid of giving my advice, so long as I charge nothing for it, to any one who asks it. I will not go out of my premises to give that advice, nor will I use a lancet or a pair of forceps on any unhappy patient who might be foolish enough to ask me to do so. But I intend to do in the future, Nottingham case notwithstanding, precisely as I have done for over forty years in the past, and as all of you may do without let or hindrance.

I have nothing new to tell you on educational matters. I still hold the views I did when years ago advocating in the London Council much greater liberality in their grants. I still think the various examinations unnecessarily high, and the fees much higher than our students can well afford, but as I failed to get support for my views on these subjects then I did not and do not care to continue to wage a war of mere words, and where no action can be expected to follow.

Yet one more burning topic of a year or two's standing, the "milk of sulphur" one. Happily it, at least for the present, seems to be burnt out, and so I do not desire to stir it up again, for if I did I fear I would only get my own fingers burnt for my pains, and for that I see no urgent call at present.

Having now exhausted the list of the topics on which there was "nothing" to say, I will, before closing, with your permission, make a few remarks upon a topic broached, so far as I know, for the first time, by myself here at the close of last session, viz., the mode of electing representatives to the London Council. My words on that occasion were as follows:—"At this hour the whole country is called upon to elect fourteen councillors to supply that number of vacancies. You, in Glasgow, are asked to record your votes for men you never saw, and never heard of, at least there are not a few names of whom I have never heard, and whom, to my knowledge, I have never seen. I felt this to be an anomaly the first time I sat at the Council table, when every face but that of Mr. Mackay was strange to me, and our Vice-President came all the way from Dartford, in the extreme south of England. I said to him that he could know nothing of me and I could know as little of him. I then suggested territorial representation, that the country should be divided into districts, London, of course, getting the lion's share in the representation, each sending a man known to it. Scotland, I suggested, should have two, one for the east, and one for the west half, or for the north and south halves, as might be arranged, etc. I broached this subject frequently in private, and would have brought it before the Council by a motion, could I have got any support to warrant me in doing so, but failing this I left the matter over. This is one point in which I agree with the Trade Association, territorial representations, and if it takes this topic up as it bears upon the London Council, I, for one, will wish it every success in it."

I have but little to add to this. Every year, and no year more than the present, has confirmed me in the opinion so expressed last year. It has been objected to this scheme that considerable difficulty would be experienced in deciding upon equitably distributed electoral districts. But surely if this difficulty was overcome with some success in fixing upon centres for carrying on the Preliminary examination, it could also be overcome here. It may, perhaps, be urged as an objection to its adoption that some of the existing and much respected councillors might by it lose their seats at the Council. I do not see that this is a necessary consequence. If Liverpool and Manchester preferred Mr. Bottle, of Dover, to any Liverpool or Manchester man willing to go into the Council, then they might elect Mr. Bottle, supposing Dover was so far left to itself as to give them the opportunity.

I do not wonder that in some quarters it has been strongly urged upon candidates for the London Council to publish their views on pharmaceutical matters, in addresses through the press, and had I been a new candidate for election, and so my views not have been known, or had it been the use and wont in existing members to publish such addresses as some of the electors desire, I would willingly have done so myself.

But I think the mode now advocated a more excellent one. Printed addresses can only give a vague idea of the candidate's general qualification for the office he seeks to fill, and tell how he intends to vote in the future, whereas if the plan of district or territorial representation be adopted, and a local man is selected as the candidate for any given district, his whole character, his social standing and influence, as well as his views on the pharmaceutical topics of the day would be thoroughly known. What he had done in the past would be as well known as what, by published addresses, he proposed to do for the future. In fact, he would be known inside and out.

If it be objected that this plan is an innovation upon the existing mode of election, I answer, it is so more in appearance than in reality. For even as it is at present the existing members of Council, though they have been put into it by the votes of the whole country, come to be looked upon in the Council, as also out of doors, as *local*, instead of as imperial representatives. The actual London men are invariably spoken of as the "London members," and as Mr. Mackay and myself too well know, he and I were everywhere and always termed "members of the North British Branch," even though it is quite certain the great bulk of our votes were English ones!

In closing these remarks it only remains, that I thank you, as I do most sincerely, for the great forbearance and indulgence you have for the last two years shown to me while occupying this chair, and I assure you that in now retiring from it, I shall continue to do all in my power, in other ways that may open to me, to show that I have not been ungrateful for the confidence and trust you have so largely extended to me during those years.

Mr. J. M. Fairlie moved a vote of thanks to Mr. D. Frazer for his address and presidency during the session, which was unanimously adopted.

At this state of the meeting Mr. Frazer had to leave, and Mr. J. M. Fairlie, Vice-President, took the chair.

Mr. Paris moved, seconded by Mr. Kitchen, "That all Council meetings be held in the evenings so as to admit of office-bearers of the assistants' section being present." An amendment being proposed and seconded, the motion was carried by a small majority.

Mr. J. A. Clarke moved, seconded by Mr. Pettigrew, "That owing to the awkwardness in getting books from the library at present, and knowing that J. Walker was willing to take charge of same at 34, Virginia Street, the case be removed there and the said party appointed librarian." Unanimously agreed to.

With reference to this motion it is particularly requested that all books out be returned to Mr. Walker forthwith.

The election of officers and council was then proceeded with, the result being as follows:—

President, Mr. A. Kinninmont; Vice-President, Mr. J. M. Fairlie; Treasurer, Mr. J. A. Clarke; Librarian, Mr. J. Walker; Council, Messrs. Daniel Frazer, John Currie, sen., T. Davidson, W. Greig, R. McAdam, W. Whyte, J. W. Pettigrew, R. Brodie, J. Foster, R. C. Rait, J. L. Hatrick, and A. Pane; Auditors, Messrs. J. Fenwick and J. C. Steele.

Owing to none present willing to accept the office of secretary, Mr. J. Walker was asked to act as such *pro tem.*

Assistants' Section.

The sixth and final meeting of the present session was held in the Andersonian College, on Wednesday evening, April 10; Mr. W. Simpson, President, in the chair.

The minutes of previous meeting were read and confirmed, after which Mr. George Gilmour read a paper on "Health."

After a few remarks by the Chairman, Messrs. Cluckie, Law, and others, the Secretary (Mr. Paris) proposed a vote of thanks to Mr. Gilmour, which was cordially given.

The annual report was read and adopted.

Mr. Simpson, after a few valedictory remarks, thanked the members for the confidence reposed in him during his term of office, and hoped that the attendance next session would be a great deal better than had been characteristic of the one now near its close.

The election of office bearers was delayed till the annual meeting of the Association, which takes place on Wednesday, May 1.

Proceedings of Scientific Societies.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held at 17, Bloomsbury Square, on Thursday evening, April 25; Mr. W. R. Atkins, Vice-President in the chair.

A paper was read, by Mr. Graham, on "Explosives." All explosions are, according to the author, due to the sudden liberation of a quantity of gas many times the bulk of the original substance. Gunpowder, as the most important explosive agent, was treated of first. It is said to have been used by Chinese as early as 200 B.C. Its composition, its decomposition, and the products of its decomposition were also described. The next explosive compounds treated of were the picrates. Picric acid when mixed with chlorate of potash forms a powerful detonating compound, as does also a mixture of picrate of ammonia and saltpetre, the latter mixture being a more powerful agent than gunpowder. The manufacture of guncotton was described, accompanied by a short history of it. The effect of the compression and confinement of guncotton in a small space was experimentally verified by the ignition of small prepared cartridges. Guncotton, however, appears liable to spontaneous decomposition, sometimes with sometimes without explosion, due apparently to small quantities of free acid acting upon it, and producing heat. Another powerful explosive is nitroglycerine; this liquid incorporated with a porous siliceous earth forming dynamite. Fulminates, as fulminate of mercury, are largely used for the preparation of percussion caps. Powerful detonating compounds might also be made by pressing powdered chlorate of potash damped with water into moulds, and treating the mass so produced with a combustible substance, such as bisulphide of carbon. Many other explosive bodies of minor importance were treated of, and the paper was accompanied throughout by experiments whenever practicable.

A discussion followed the paper, and the evening terminated with a vote of thanks to Mr. Graham for his admirable paper.

Parliamentary and Law Proceedings.

The Prosecution of Soda Water Manufacturers.

At the Huddersfield Borough Police Court, on Tuesday, April 23, the case in which George Brighouse and others, trading under the style or firm of "The South Yorkshire Aerated Water Manufacturing Company," were charged with selling soda water which had no soda in it, was called on.

Mr. Piercy stated that the case had been adjourned in order that his clients might have an opportunity of considering whether they should call evidence or submit to the penalty which the Bench expressed their intention of inflicting. The defendants had been advised by their solicitors to submit to the penalty, and the defendants therefore left themselves in the hands of the Bench. The directors proposed to have two classes of water in future, soda water proper and aerated water simply, so that the public might have their choice. The directors had had a sample of the soda water analysed by the borough analyst of Bradford, and his certificate was to the effect that there were three grains of soda in it, but no copper or lead.

The Bench fined the defendants Brighouse and others £2 and the expenses.

They also fined Charles Tinker, Huddersfield, soda water manufacturer, £2 and the expenses; and John Ellis, Westgate, fruiterer, and Benjamin Crampton, landlord of the Plough Inn, Westgate, were each fined 10*s.* and the expenses.

Serious Charge against a Medical Practitioner and a Chemist and Druggist.

At an inquest held last week at the Sussex County Hospital, Brighton, respecting the circumstances attending the death of a young woman named Hockley, evidence was given that resulted in a serious charge being made against a medical practitioner and a chemist and druggist. A man named Cole, who was cautioned before being sworn, stated that in consequence of the deceased believing that she was *enciente* by him he had applied to Mr. Darley, chemist and druggist, who had supplied him with several bottles of medicine, for which he had paid 5*s.* per bottle. Deceased took this medicine, but the object not being attained, Mr. Darley introduced him to Mr. Moon, a surgeon residing in Pelham Street, Brighton, who undertook the treatment of the deceased. Deceased subsequently died in the hospital, after a miscarriage. At the adjourned inquest, on Monday, the jury returned a verdict of wilful murder against Moon, and one of being an accessory before the fact against Darley.

The subject has also been before the Brighton Bench, and the magistrates have committed Moon and Darley for trial on similar charges.

Obituary.

Notice has been received of the death of the following:—

On the 23rd of February, 1878, Mr. Richard Wilson, Chemist and Druggist, Clay Cross, Derbyshire. Aged 54 years.

On the 12th of April, 1878, Mr. Leonard Abraham Uttley, Chemist and Druggist, Blackburn. Aged 48 years.

On the 27th of April, 1878, at North Walsham, Mr. Albert Richard Priest, Chemist and Druggist, formerly of Parliament Street, Westminster. Aged 33 years.

On the 30th of April, 1878, after a long and painful illness, Mr, Rowland Powell, Chemist and Druggist, Temple Street, Bristol. Aged 50 years.

Dispensing Memoranda.

[54]. Creasote Dispensing.—Not unfrequently I dispense mist. creasoti, B.P.

O.

[104]. Palma Christi.—The preparation intended by the doctor was Greenish's fluid extract of Palma Christi. I have often sent out this preparation and found it correct. The patient was evidently troubled with a deficiency of milk, and this preparation is strongly recommended for promoting an abundant flow of milk.

Also *vide* "Squire," which states: The decoction of the leaves of Ricinus applied to the breasts is said to produce an abundant supply of milk.

Exeter. An Associate.

[104]. What was meant by Palma Christi was no doubt Liq. Fol. Ricini, a specialty by Mr. Greenish, and once largely used for increasing lacteal secretions.

G. J. Knight.

[105]. Parrish's unquestionably; although some wholesale houses put Easton's in their lists under that name.

G. J. Knight.

[106]. Sodæ Bicarb. would be intended.

G. J. Knight.

[107]. Sp. Æth. Comp. (Pharm. Lond.)

G. J. Knight.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Trade Side of Pharmacy.

Sir,—Admittedly, pharmacy dwells on the border land between professions and trades, partaking therefore, more or less of the character of both. Those who have done anything in the study of natural history know full well how many of the minute forms of life have been handed by microscopists to and from one or other of the two kingdoms. Now an eminent naturalist declares the Diatom to be an animal, then another equally eminent proves most conclusively that it must be vegetable, and so it remains till a third discovers some new character which again ranks it with the higher form of life.

Just in the same way, whilst most pharmacists throughout the country know pharmacy as a trade only, there are those who regard it entirely as a profession; let us on the present occasion look at it from a trade point of view. I have taken this first because it is of primary importance, without it the pharmacist would cease to exist, therefore, the second or professional position would be null and void.

The whole country lies before us, with its towns, large and small, and its villages too; its aristocratic and democratic neighbourhoods; its seaports, agricultural, manufacturing and mining districts, all of which must be supplied with that very necessary individual the pharmacist. It is too much to expect any one individual possesses a nature so plastic as to adapt himself to the varied requirements of these different positions, and the first important business transaction in the pharmaceutist's history is the proper selection of a locality, the requirements of which his special nature or training renders him a fit individual to supply. A mistake in this has often proved a most serious one for life. Some have "gone to Rome without doing as Rome does;" how far they have succeeded the Bankruptcy Court and Benevolent Fund will probably be the most eloquent exponents. There must be a proper adaptation of the individual to the environment, or a suitable selection of environment for the individual, as a necessary preliminary to success.

Having commenced business, the first problem is how to live? If his lot has fallen in a good neighbourhood, where medical men do not dispense their medicines, he will have to avoid prescribing and the prominent display of patent and proprietary articles as far as possible. But if in a country town or poor neighbourhood, such a course would be suicidal. He must prescribe in simple cases, must freely sell patents, possibly homœopathic medicines, and might even have to add some other trade to enable him to solve the problem "how to live." He is in a free country; the law demands of him, it is true, honesty and integrity; but is there anything incompatible with this in trade conducted thus? Most assuredly not. In any other calling, energy, fair competition and the display of a man's abilities are commended; why, in pharmacy, should they be questioned? Life itself is a competition, a struggle for existence, with its inevitable result "the survival of the fittest." The demands of his business or other considerations might necessitate his supplying some few articles sold by the grocer; the latter, observant of this, adds to his stock toilet soaps, and perhaps the later encroachment, patent medicines. The medical man, too, finds that some of his patients consult the pharmacist for the relief of their minor ills, but unlike the grocer he has no available means of entering into competition, therefore he falls back on the protective principle, and asserts that legally the chemist has no right to prescribe. It appears, however, much easier to assert this than to prove it; indeed, prescribing from medical and pharmaceutical points of view is essentially two different things; with the former it is the acme of professional duty, with the latter it belongs to the trade side of pharmacy; the former trusts to his own diagnosis, whilst with the latter the most important part of the prescribing is done by the patient himself, the chemist merely giving such remedy as seems to him most desirable or most suited to the case as described by the patient. The matter is now being contested in the courts of law, and whilst we have every promise of a satisfactory issue it is well not to anticipate. From the fact that the law requires certain qualifications on the part of the medical man he is entitled to a certain amount of protective legislation, the only question for decision is where the line is to be drawn. The chemist also conducts his business under legal restrictions, the breach of which renders him liable to prosecution, fines and penalties; and he, too, has a just claim on protective legislation, which in fact is really granted in the exclusive right to retail and dispense poisons, and in the reservation of certain titles. Now no one can dispute that, wherever this reservation of right is violated, he might fairly ask at the hands of the law the full protection that it gives as an equivalent for what it exacts. There are at least two flagrant instances in which if not law most certainly justice is being set at nought; I refer to the sale of patent medicines containing poisons by drapers, stationers, and other unregistered persons; and to the sale of not only these but other poisons, and dispensing the same by co-operative societies under the pretext of having a qualified manager. By a clause in the Pharmacy Act we know that a patent medicine stamp is allowed to be more than an equivalent for common sense, but I fail to find any exception in favour of co-operative stores. It might be this latter is an illustration of what we are told is usually the case, viz., "that a coach and four might be driven through any Act of Parliament," and if so the sooner we unitedly and vigourously set about repairing the breach the better. For my own part I cannot conceive that there would be any difficulty in demonstrating to our legislators in a satisfactory manner that to correct these two anomalies would be to benefit the public at large quite as much as the existing poison regulations can possibly do.

But we are considering trade pharmacy as a whole, and I certainly feel that it is not alone, or indeed, chiefly to protective legislation that we must look for the extension of our business. There is much that is closely associated with pharmacy which lies waiting for development. Dietetics, for example, are still open to much improvement and extension of sale; preparations for the use of the agriculturist are still behind the progressive condition of the age; dyes, colours, mordants, etc., are all compatible with pharmacy—indeed, to every chemist, whatever his position or locality, there must and does occur at some time or other means by which extension of business would most assuredly follow well directed efforts. But my subject is proving too lengthy; it appears to widen rather than draw to a close, and I must terminate somewhat abruptly these reflections with a hope that they might at least be found suggestive, and might possibly help some brother pharmacist to see his way to an amelioration of the difficulties he has to contend with, or to the extension of a small and insufficient business; if so the space which I have occupied in this Journal on the trade side of pharmacy will not be lost.

CHARLES SYMES, PH.D.

THE ELECTION OF COUNCIL.

Sir,—To the naturalist few questions have a greater interest than that known as "protective mimicry." Mr. Bates, the author of the 'Naturalist on the Amazons,' has described how a tribe of butterflies, of gaudy colour, enjoys exceptional immunity from the attacks of birds. There is also found a species of a structurally distinct genus which has assumed the facies of these Heliconidæ and finds its reward in sharing the immunity of the butterfly it simulates. Mr. A. R. Wallace and many other observers have added confirmatory facts, drawn from many classes of animal life and from many countries.

The student of sociology is not without somewhat analogous instances. The contest between rival candidates for the honour of representing us on the Council of the Pharmaceutical Society has, I believe, supplied such an illustration. Before me lies the card of a candidate, who states—"It has been suggested by some of my friends that I should issue a post card to the leading chemists, asking a vote from such as feel with us the desirability of having the trade interests of our body more thoroughly represented in the Council of the Pharmaceutical Society. If you will kindly record a vote in my favour it will further this object and oblige * * * "

Having been a good deal identified with the principal movements in defence of trade interests, this profession of zeal for them from such a quarter was not what my memory would have led me to anticipate.

By a few references to your columns I find that this candidate's recorded services to trade interests have been the following:—(1) When the trade was stirred as it never had been before by the obnoxious poison regulations of 1871, he moved, "That this meeting approves of the proposed poison regulations," and found two supporters only in the largest provincial town in England; (2) in a following year he recorded his opinion of the Pharmaceutical Council of 1872, elected under strong feelings in favour of trade interests, "That it too much resembles the executive of the Chemists and Druggists' Society—too little the old Pharmaceutical Council."

And although, as a much-harassed people, we have often had to take up arms for self-protection, our candidate has never done even as much in that direction as Diogenes, who fell in with the popular humour so far as to roll his empty tub up and down the streets of Athens when all her citizens were preparing for war.

It is, of course, somewhat cheering to believe that trade interests are in the ascendant, and far be it from me to check an incipient zeal for these in any neophyte. I will grant that he may have had the germ even when the outward manifestations were so much against the probability. But to accept this as a proved fact requires almost as much literalism as it would to agree with the man who insisted that he had been cut in two because he once sliced off the top of his little finger.

The coming election will bring before the constituency candidates who have been staunch friends of trade interests within the Council and some who have shown similar devotion outside that body. If any profess such zeal without past evidence let us distinguish the real from the mimetic and see that the result shall be "the survival of the fittest."

FIDE SED CUI VIDE.

April 30, 1878.

THE WEIGHTS AND MEASURES BILL.

Sir,—I hoped to have seen some notice of the Weights and Measures Bill in your correspondence columns to-day, but was disappointed to find a subject of so much importance entirely unnoticed. I trust the Council of the Society will make an attempt to restore the permission to use the apothecaries' weight in the sale of drugs by retail, or we shall all be in a very serious position, and indeed entirely unable to carry on our business lawfully.

If the measure pass in its present form it seems to me that not only will the ʒj and ℈j weight be illegal, but almost every weight that we use in dispensing, and all our glass measures will be so likewise, as it will be unlawful to have in our possession any weights or measures not of the Board of Trade denomination, which I suppose scarcely any weight that we use from 2 grains to ℥j. or any graduated measure will be. It may perhaps be said that dispensing is not trade, and therefore the law will not apply. But if dispensing is not trade its results are; and even supposing the weights as now used to be allowed in dispensing we should not be much the better, for there is not a day in which we are not obliged to use these weights in trade; if people do not want a scruple or a drachm they want 20, 30, 40, or 60, or some odd number of grains, and how are we to supply them with avoirdupois weights, or how supply a fluid ounce of sal volatile or paregoric?

Unless some means are taken to protect us the Bill will provide a rare harvest for the flock of cormorants who under the name of analysts, inspectors, and officials of various denominations are always on the look out for prey in the shape of fines, costs, etc., from us unfortunate shop-keepers under the pretence of protecting the public from adulteration and fraud, but who as far as I can see seldom interfere in any real cases of either.

W. WILKINSON.

Manchester,

THE SALE OF PATENT MEDICINES.

Sir,—Will you please kindly allow me space again to say a word or two in notice to the sarcastic spirit of "Hampshire" in reply to mine upon the degrading low price system of some of the drug trade of the present day, and at this I only aimed. I should not have troubled you to give any answer to the long "stride" of "Hampshire," perceiving he has been much further afloat than it has been my lot, but I suspect he is indeed one of those who favour the very system of the so-called co-operative drug companies upon which I gave my mite in discharge of my knowledge and thoughts of the subject, and I do not now eat my words. Let Mr. "Hampshire" or any one else gainsay and "peck" at every word that is said, the facts are the same, and he himself says the statements given are "only too true."

My signature, "Sussex," seems particularly to annoy him, so much so that he would alter it into an old, withered, wrinkled man or woman—"senex." This act of forgery and all connected passages of the same strain are to my own mind only "jeers," and I may add that I have no thought of being a lounger or living an idle gentleman, being always fond of my business, and so remain to the present time, and were I possessed of £10,000 would prefer being in my business rather than an idler, although I am an aged man. Moreover, I do not think as he thinks or as he says; I think, let every man think and say for himself—what is true!

I beg to close these few lines in some little response to the many score that have been rightly or wrongly construed and written in reply to my simple letter on the subject of the disgraceful prices that are now charged for drugs, etc., even in the aristocratic queen of the South Coast, Brighton, namely, 4 ounces of epsom salts for 1*d.*, 1 ounce of castor oil for 1*d.*, etc., etc. "Hampshire" says, "there is no help for this sort of thing." Who began this sort of thing? Oh, fie! Oh, fie! Nevertheless, all this bandying of words is not to much purpose as far as my small friend "Hampshire" cares. Still, my friends may suppose if I now remain silent that I am altogether "stunned" by this "Hampshire" blow.

I will say here that I do not use Sacred Scripture in every trivial thing, so pass over this slur.

Do forgive the old man "Sussex's" singular education in consideration that his school days were in the time of poor old "Squeers."* But for a final hint. Monopoly, or monopolize, is a proper word for a man who would engross all the drug business into his own hands by selling at ruinous charges. Competition there can be none, for who dare to compete here?

"Sussex."

Sir,—It appears to me to be inconsistent on the part of your correspondent "Hampshire" to take up more than a column and half of the Journal, whilst deprecating the actions of your previous correspondents who have, in the exercise of their liberty of thought and opinion ventured to address you on the state of our trade.

The tone exhibited in your correspondent's letter is most pugnacious and unbrotherly, and in my opinion deserves censure. It is quite enough to have foes outside the camp; we ought to be united and sympathetic within.

It is, I think, a gross piece of presumption for "Hampshire" to say to a brother chemist, "Surely in that time (fifty years) he should have made a fortune, and should at least now leave the field to younger blood," etc.

Surely it is "a waste of your valuable space" for Hampshire to "go ahead" in the reckless denunciation of those who have grievances which they seek by a fraternal appeal to remedy.

It would be a waste of my time to follow "Hampshire" all through his "rigmarole."

The remedy I suggest for the evil complained of, is a mutual agreement between the chemists and druggists in each town as to prices, etc., etc., as far as the various natures of their respective businesses will permit.

16 *and* 17, *Cliffe, Lewes.* W. T. Martin.

The Stamped Nostrum Trade.

Sir,—When a chemist and druggist permits his name to appear at the foot of a handbill for Professor Pillaway's pills or Dr. Pinchbeck's golden ointment he is justly supposed to endorse every statement, however extravagant, that may be uttered thereon.

It is also assumed that nothing he himself compounds can by any possibility be so good as the article for which he is thought to have solicited the agency.

Throughout the length and breadth of the land our windows are blazoned with chlorodyne transparencies, Dr. Burntsucker's sarsaparilla, exhilarating salines gorgeously wrapped, Sixbob's plumbic hair restorer, and some other shady preparations which I need not name.

The only specific for these specifics is, combine to cease from exhibiting them, cease from all placards, transparencies and handbills concerning them, compound such remedies as there is good reason to believe will be truly serviceable, and for counter bill purposes use printed circulars giving truthful names and uses of such remedies only as are put up in our own pharmacies.

If the trade would only combine for this instead of working out our own extinction as preparers and compounders of medicines by cramming the community with all the nostrum bills foisted gratis upon us through the wholesale houses and so effacing ourselves and debasing ourselves, I think we should have less to complain of than now.

Even if the sale of stamped medicines were confined to our own ranks, stupidity, envy, and greed amongst ourselves would break out and cut prices perhaps more fiercely than ever. Moreover, there is no skilled thought or labour in the mere vending of these stereotyped articles. If your readers will stretch their minds to a consideration of this circumstance they may discern results flowing which it is impossible to overcome.

Any one can sell stamped medicines as easily as postage stamps, and for the life of me I can see no reason why all traders may not sell one as well as the other.

It may be urged that for the protection of the public they are best in our own hands. Protection of the public, indeed! How many amongst ourselves protect our customers from the plumbic hair restorers mentioned above? How many in the trade feel that they have influence enough or even care to protect a poor family from purchasing a 2*s.* 9*d.* Gander's ointment when a stone of flour would for them be a more desirable investment?

On the contrary, our old chatty friend, "Counter Practice," brings one more to the knowledge of their condition and thereby into sympathy with their requirements.

Counter practice—Oh dear no! trouser the 2*s.* 9*d.* and no more bother. This is the policy of too many; too many have neither heart nor brains for any exertion beyond the supreme felicity of putting three shillings into a till and handing out three pence change; in other words, doing nothing and getting well paid for it.

Ictus Equi.

York, April 27, 1878.

"*Brighton Assistant.*"—We do not find the letter you refer to. One aspect of the subject has already been dealt with, as may be seen by reference to No. 403.

"*Curator.*"—See the article on "Peltry," in Ure's 'Dictionary of Arts and Manufactures.'

J. H. Williams.—Hayward's 'Handbook of British Plants' (Bell and Co.), or Bentham's 'Handbook of the British Flora' (L. Reeve and Co.).

"*Minor.*"—(1) Bentham's 'Illustrated Handbook of the British Flora,' published by Reeve and Co., Covent Garden. (2) We cannot say at present.

"*Occidens.*"—(1) *Jungermannia albicans*; (2) *Pellia epiphylla*; (3) *Jungermannia Wilsoniana*; (4) *Gymnostomum microstomum*; (5) *Trichostomum rigidulum*; (6) *Ptychomitrium polyphyllum.*

"*Alpha.*"—(1) *Sphagnum recurvum*; (2) *S. cymbifolium*; (3) *S. squarrosum*; (4) *Hypnum fluitans*; (5) *H. Kneiffii.*

J. W. Barnes.—The terms of your question disclose the fact that you are quite competent to furnish an answer to it yourself.

C. W. Lawton.—Apply to the Principal of the Laboratory, Somerset House.

"*Anxious Inquirer.*"—See Professor Abel's paper on "Substitutes for Gunpowder," in vol. iii. of the present series of this Journal, pp. 565 and 583.

"*April.*"—The fitter could be compelled to comply with the terms of the contract.

Communications, Letters, etc., have been received from Mr. Rimmington, Mr. Savage, Mr. Haydon, Mr. Hunn, Messrs. T. and H. Smith, Mr. Stephens, Mr. Brown, Mr. George, Mr. Hurst, Mr. Langbeck, Professor Flückiger, Dr. Craig, Mr. King, Devonia, Novice, Apprentice, J. K., O., H. H. P.

* "Squeers" Dickens).

QUINIRETIN.

BY PROFESSOR FLÜCKIGER.

Forty years ago Geiger was well aware of the fact that aqueous solutions of salts of quinine are decomposed in sunlight. It would appear that Pasteur* attributed this alteration to the formation of quinicine and cinchonicine, for in his researches on the two latter substances, he remarks: "J'ai reconnu, en effet, qu'en exposant au soleil, seulement durant quelques heures, un sel de quinine et de cinchonine quelconque, en solution étendue ou concentrée, il s'altère à tel point que la liqueur prend une coloration rouge-brun extrêmement foncée. Cette altération est d'ailleurs de la même nature que celle qui s'effectue sous l'influence d'une température élevée." He recommended the manufacturers of quinine not to expose to direct sunlight either their products or even the barks.

Carles† exposed powdered Calisaya bark to sunshine during the month of August and found it to yield afterwards less quinine than before. Broughton‡ likewise pointed out the detrimental influence of direct sunshine on barks collected in the Government plantations in the Nilghiris.

Hesse,§ on the other hand, stated that the influence of light was by no means so powerful and did not favour very vigorously the formation of amorphous alkaloids. He exposed for seventy-three days to sunlight an aqueous solution containing 3·72 per cent. of quinine in the form of sulphate. Quinicine was found to be at last contained in the liquor, besides a red amorphous substance no longer possessing the property of neutralizing the acids. Hesse did not meet with the latter in the barks as might be expected, supposing sunlight to act in the same way on the alkaloids contained in the tissue itself.

Mr. David Howard‖ ascertained that quinicine at least occurs in the mother-liquids obtained in manufacturing quinine, and Dr. de Vrij¶ is of the opinion that not only quinicine and cinchonicine but another third amorphous alkaloid is present in the barks.

The influence of sunlight on the latter and on their bases is a very interesting question, as shown by the experiments just alluded to. They refer not to the alkaloids, but to salts of them. What part is played by the acids with which the alkaloids are combined? Are the alkaloids themselves likewise altered by sunshine or only their salts?

I thought it of some interest to submit quinine to a few experiments and was struck to see how rapidly and thoroughly it is altered. 2000 parts of water at 17° C. dissolve a little more than 1 part of quinine, yielding a clear solution, which remains colourless and clear for any length of time, provided it be kept in the dark or in dispersed daylight, in closed or in open phials. But on exposure to sunlight, in July or August, for a few hours, the liquid turns yellowish or brownish, the coloration being developed uniformly in the whole solution, not beginning at the surface. By and by it becomes turbid, and after a few days a flocculent brown matter sinks down, amounting when dry to nearly the quantity of quinine originally employed. A very little of it remains in solution, for the latter remains brownish and has always a bitter taste reminding of quinine. Yet in the clear solution the alkaloid is present in so trifling an amount that the brown liquid becomes but very faintly turbid on addition of either tannic acid or iodohydrargyrate of iodide of potassium. By both these tests, as well known, precipitates are produced in a solution containing even less than 1 part of quinine in 2300 parts of water, before it is submitted to the action of light.

The transformation of quinine into the brown flocculent substance, which for the sake of brevity may be termed quiniretin, is due to sunlight exclusively. If water is boiled in order to deprive it of air as much as possible, and then saturated with quinine, the cooled filtered solution keeps perfectly colourless until it is exposed to sunlight, when it soon begins to turn yellowish. It is true, however, that in a closed tube, in the dark, the aqueous solution if quinine turns red, yet not brown, as soon as it is heated to 170° C.; at 300° it affords an intensely red liquid. The effect of sunlight is the same if the solution of quinine is deprived of air by a current of hydrogen and the tube immediately closed; the solution thus absolutely deprived of oxygen becomes brown in sunlight.

The brown substance which I call quiniretin must therefore continue to have the same composition as quinine, but it is modified in an extremely remarkable way; it is neither quinine or quinicine, nor does it contain a trace of either. Quiniretin is devoid of an alkaline reaction, insoluble in both alcohol and ether as well as in hot or cold water, softening but a little in boiling water. It is not fusible, but melts only far above the melting point of quinine, yet quiniretin then undergoes a thorough decomposition.

Quiniretin is dissolved by acids, but unable to neutralize them or to combine with them. It is abundantly soluble in hydrochloric acid, 1·11 sp. gr.; this solution displays an intensely brown colour and may be diluted with water without becoming turbid. Its very bitter taste reminds of that of quinine, but it is at the same time somewhat, I may say, aromatic. The hydrochloric solution of quiniretin is not precipitated by tannic acid; this is likewise in favour of the statement that it is not an alkaloid. The solution is precipitated on the other hand as soon as it is neutralized by ammonia, yet quiniretin is not dissolved by an excess of the latter, and in this respect too it differs from quinicine.

It must be granted that the iodohydrargyrate of potassium (1·35 per cent. chloride of mercury, 5 iodide of potassium, 100 water), yields an abundant precipitate in the hydrochloric solution of quiniretin, but the same may be said with regard to other salts, for instance, chloride of ammonium or sodium.

A small quantity of dilute sulphuric acid (1·112 sp. gr.), gently warmed and shaken for a day or two with a large excess of quiniretin, affords always an acid liquid of a yellowish hue, far less coloured than the hydrochloric solution. The former is not fluorescent and is decolorized by chlorine water. On addition of ammonia the latter assumes a dingy green hue or yields a greenish precipitate; these reactions succeed better if quiniretin is immediately dissolved in chlorine water (it will usually contain an appropriate amount of hydrochloric acid), and ammonia added to it. This behaviour agrees with that of quinine, quinicine, and quinidine (conquinine), yet quiniretin

* *Comptes Rendus*, xxxvii. (1853), 114.
† *Journ. de Pharm.*, xii. (1870), 161.
‡ 'Blue Book, East India Cinchona Plantation,' 1870, fol. 241, 243, 118.
§ *Annalen der Chemie*, clxvi. (1873), 275.
‖ *Pharm. Journ.*, i. (1871), 845, and ii. (1872), 765.
¶ *Pharm. Journ.*, iv. (1874), 589.

again differs from these three alkaloids, inasmuch as it does not afford that red tar (Grahe's test), which makes its appearance if barks containing quinine, or the allied alkaloids, or certain salts of them, are heated in a glass tube.

Quiniretin consequently differs very widely in many respects from quinine, its mother substance, the composition of which quiniretin must necessarily share with regard to the conditions of its formation, as pointed out above. I may add that I have restricted myself to ascertaining the presence of nitrogen as a constituent of quiniretin. The intense action of sunlight, especially in summer, causes the quinine to be transformed. The alteration is not precisely more favoured by acids; the aqueous, and also the alcoholic solution of pure quinine is more rapidly transformed. Dry quinine requires more time. The other alkaloids of cinchona are much less affected by sunlight than quinine, at least in aqueous solution. This no doubt depends upon their sparing solubility, quinine being more readily dissolved by water. It is interesting to see how little kinic acid is altered by sunlight; saturated or diluted aqueous solution of it was but almost imperceptibly affected after a summer's stay in sunshine. As to quinovin, I noticed the absolute absence of any coloration after a similar treatment.

Aqueous solution of morphine is very slightly coloured by sunlight, solution of codeine very much; solution of strychnine is scarcely altered, that of brucine turns brown. It is evident that the amount of solubility is of prominent importance in these experiments, codeine as well as brucine being much more abundantly soluble than morphine and strychnine. Further experiments relating to these remarkable effects of sunshine should be simultaneously instituted by means of other solvents than water.

I thought my few observations worthy of notice, inasmuch as they refer to quinine itself, other chemists having examined its salts. It would appear that the absence of acids prevents the formation of quinicine.

THE TURPENTINES AND RESINOUS PRODUCTS OF THE CONIFERÆ.

BY DR. JULIUS MOREL,

Professor of Chemistry in the Industrial School, Ghent.

(*Continued from page* 727.)

XVI. OIL OF JUNIPER.

Synonyms.—L.: Oleum baccarum Juniperi.—F.: Essence de Genévrier commun; Essence de Genièvre; Oléule de Genévrier.—G.: Wachholderbeeröl.

Botanical Source.—Juniperus communis, L.

Juniperus minor, Fuchs, Hist. 15, 16.

Juniperus vulgaris baccis parvis, J. Bank., Hist. i.–ii. 293; Ray, Hist. 1411.

Juniperus vulgaris fructicosa, Bank., Pin., 488; Tournef, Inst., 589; Duham., Arbr. i. 321, t. 127.

Juniperus vulgaris arbor, Bank., Pin., 488.

Juniperus communis vulgaris, Loud., Arbor., iv. 2489; Encycl. of Trees, 1081.

Juniperus communis, Lin., Spec. 1470 (excl. syn. γ); Schk., Handb., t. 338; E. B., t. 1100; Fl. Dan., t. 1119; Lam., Dict., ii. 625 (excl. syn. β); Rich., Conif., 33, t. 5; Loisel, Nouv. Duham., vi. 46, t. 15; f. 1 (excl. syn.); Desf., Hist. Arb., ii. 358; Spach, Hist. Vég. Pharm., xi. 308; Endl. Syn. Conif., 15; Loud., Encycl. of Trees, f. 2013; Lindl. and Forst., Journ. Hort. Soc., v. 200; Knight, Syn. Conif., ii.; Le Maout, Lec. élém. de Bot., 632; Atl. élém. Bot. (ic. Carr., Man. des Pl., 309; Tr. Gen. Conif., 21; Gord., Pinet., 93 (excl. var. *Cracovia*).

This plant grows in the northern regions of both hemispheres, and is met with also as a shrub in the mountains of the south. The fruit, which is a soft fleshy cone or galbalus, is sold in commerce under the incorrect name of juniper berries. These are collected at maturity, that is about the end of the second year after they appear, when they have become of a dark violet-blue colour. The globular cones contain three seeds, which are triangular, ovoid, and bear upon their surface, and especially on the dorsal surface a number of large oleoresiniferous glands. The oleoresin is at first fluid, but gradually hardens, and penetrates the surrounding tissues.

The principal supply of juniper berries comes from the south of France, but some also comes from Austria and from Italy.

Preparation.—The character of the volatile oil and the quantity yielded varies according as it is extracted from ripe or from green berries. In the green berries two essential oils of different densities are met with; the ripe berries contain only the heaviest of these two oils. The oil is obtained by the method of distillation generally employed in the preparation of essential oils. The distillation of green berries gives a larger yield of essential oil than that of ripe berries, but the proportion of the heavy volatile oil is not so large as when the ripe berries are used.

Planchon has pointed out that the yield may also be affected by the manner in which the distillation is carried on. If the ripe berries be distilled directly with water about 0·4 per cent. of oil can be obtained; but if the precaution be taken of allowing the berries to macerate previously in cold water, as much as 0·75 per cent. of oil can be obtained from the same fruit. For these reasons the yield may be described as varying between 0·4 and 2·0 per cent.

The oil obtained from the berries is that ordered in most pharmacopœias; essential oil can, however, be obtained from juniper wood, but the proportion yielded is much inferior to that from the berries.

Characters.—Oil of juniper is usually a colourless or very pale yellow liquid, sometimes yellowish-brown or even greenish. It has a strong odour resembling that of the fruit and other parts of the plant, a hot, resinous and aromatic taste, and a specific gravity varying from 0·86 to 0·88. It distils between 155° and 280° C., and is neutral to litmus. Examined in a column 50 mm. long it rotates the plane of polarized light 3·5° to the left. The oil is soluble in 10 to 12 parts of 80° alcohol, in half its volume of absolute alcohol, and in all proportions in ether. According to most authors iodine, projected into the oil, causes an explosion, an elevation of temperature and the evolution of violet vapour. In fact, a very smart explosion takes place when recent oil of green berries is used; but the explosion is less energetic with older oil. Oil of juniper does not dissolve fuchsine in the cold, but with heat it reduces it. Sulphuric acid causes an elevation of temperature, the formation of vapour and a turbid solution, at first brown but afterwards passing to blood red or cherry red; upon the addition of alcohol this solution changes to a chamois or a dirty rose colour and remains turbid even when heated. Like turpentine oil it absorbs hydrochloric acid gas and forms with it a liquid compound, which when left in contact with water a sufficiently long time gives a crystallizable hydrate. Solution of bromine in chloroform does not at first colour oil of juniper, but after a few moments a greenish-blue coloration takes place. Chloral hydrate does not immediately produce any change, but in a short time the oil becomes yellow, passing successively to greenish-brown, clear green and deep green. Alcoholic solution of hydrochloric acid colours it brownish red. Frohde's reagent produces a deep brown colour, passing first to clear red and then to deep red. Fuming nitric acid, picric acid and ammoniacal solution of silver nitrate give the same reactions as with turpentine oil. Most of the foregoing reactions have been quoted from Dragendorff's 'Studies on Essential Oils' (*Pharmaceutical Journal*, [3], vol. vi., p. 541).

Composition.—The two essential oils, which, as before mentioned, are obtained in very variable proportions according as the green or the ripe berries are operated upon, are two hydrocarbons having an identical composition. One, represented by the formula $C_{10}H_{16}$, has a sp. gr. of 0·839, begins to boil at 155° C., and is very slightly soluble in 80 per cent alcohol; the other, $C_{20}H_{32}$, which is predominant in the ripe berries, has a sp. gr. 0·878, boils at 205 C., and is generally more coloured than the first-mentioned. Both these oils readily absorb oxygen, and when exposed long to the air deposit a camphor that is slightly soluble in water, very soluble in ether, and soluble in boiling alcohol. The alcoholic solution left to cool deposits crystals of camphor.

According to Donath (*Pharm. Journ.* [3], vol. iv., 417), besides the vegetable constituents met with in all fruit and the essential oil, juniper berries also contain acids, waxy matter, 8·46 of a green resin soluble in ether, 1·29 per cent. of a brown resin soluble in alcohol, and 0·37 per cent. of a bitter principle called juniperin.

Adulterations.—Oil of juniper is frequently adulterated with lower priced oils and especially with turpentine oil. Turpentine oil renders the characteristic odour of juniper oil much less agreeable, and in many cases the odour is sufficient to raise a suspicion as to the sophistication. The chemical reactions above described, taken in conjunction with those given under turpentine oil, are sufficient for the easy detection of this adulteration.

According to experiments made by Dragendorff, recent juniper oil dissolves in three times its volume of 93 per cent. alcohol and in four volumes of 91 per cent. alcohol. A larger proportion of alcohol produces turbidity. The recent oil dissolves in all proportions in 95 per cent alcohol. It has therefore nearly the same solubility as turpentine oil.

According to the same author the same oil, after having been prepared five years, dissolves in 0·25 times its volume of absolute or 98 per cent. alcohol, and in 0·30 times its volume of 97 or 96 per cent. alcohol. A larger quantity causes turbidity, but the extent will be larger in proportion as the oil contains water. Less concentrated alcohol will not give a clear solution, but the greater part of the oil dissolves in four volumes of 90 per cent. alcohol, five volumes of 92 per cent. alcohol, seven volumes of 90 per cent. alcohol, and ten volumes of 86 per cent.

It follows therefore that the different solubility of juniper oil after a certain time allows of its being distinguished from turpentine oil by means of alcohol. In the 'Jahresbericht über Pharmacognosie' for 1873, p. 414, there is a table indicating the adulterations of juniper oil with turpentine oil, copaiba oil, and eucalyptus oil, showing the proportions of the adulterants and relative quantities of alcohol to be employed to detect the presence of foreign oils.

Uses.—The essential oil of juniper constitutes the active principle of the plant (wood, leaves, and cones), to which it owes its stimulant and diuretic properties. The oil is prescribed in doses of 2 to 6 drops, in pills, as an emulsion, or in mucilage. For external application it is used in alcoholic solution (Spiritus Juniperi), and it enters into the composition of several liniments, opodeldocs, etc. In medicine the use of the berries is frequently preferred to that of the oil, which is not free from danger. The inspissated juice is used in the preparation of an alcoholic drink, from which the English name, "gin," takes its origin; it is the French *genièvre*, the Dutch *genever*, and the German *Wachholderbranntwein* and *Steinhäger*.

Formerly the resin was collected from the stem of the plant, and sent into commerce under the name of German sandarach.

(*To be continued.*)

REMARKS ON PRESCRIBING.*

BY WILLIAM CRAIG, M.D., F.R.S.E.,
Lecturer on Materia Medica, Edinburgh School of Medicine.

The subject of prescription writing is one in which both physicians and pharmaceutists ought to take a deep interest. It forms a bond of union between the two professions. We meet here on common ground, and I trust it will not be altogether inappropriate that I make a few remarks on this important question this evening.

It is no part of my intention in this short paper to refer specially to those various questions regarding prescriptions which have been discussed so fully in your Journal during the past year. I have no wish to occupy your time with such questions as this, whether ℞ originally refers to an invocation to some heathen deity, or whether it is not simply a contraction for the Latin word *recipe*, a word which if it be not expressed is certainly understood in all prescriptions, and governs the quantity of the medicine prescribed.

I wish to consider this subject in a twofold aspect, both as regards physicians and pharmaceutists, pointing out our mutual relations to these prescriptions and endeavouring to find out in what way each of us can do his part to make our prescriptions as good as possible. With this object before my mind I shall consider prescriptions in their twofold relation, to the writers and the dispensers. Both have certain duties to perform and it is of importance that these be properly executed.

You can easily perceive how this subject is one of deepest interest to every member of our profession and I presume it is not less interesting to chemists and druggists. The number of prescriptions which are daily issued by members of the medical profession must be enormous. A physician seldom sees a patient without prescribing some medicine for him, and that irrespective of the age, rank, or malady with which he is afflicted, and surely it is of the utmost importance that the medicine prescribed be not only the best possible medicine but that medicine in the best and most agreeable form. Not only is the number of prescriptions very large, but the effects which they produce on our fellow men must be very considerable, and thus this subject is one whose importance it is not easy to over estimate.

* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, April 19, 1878.

I have always maintained that this subject has never received the attention it deserved in the teaching of medical science. The student in many cases is not taught sufficiently the great principles which ought to regulate all prescription writing.

I shall first say a few words about prescription writing in so far as it bears on medical practitioners:—

I. Having selected the medicine we wish to give the patient, the first thing which we have to consider is, the dose of that particular medicine and the frequency of its administration. The question of dose is one of considerable importance, much more so than many members of our profession are apt to suppose. It is one thing to know the dose of a particular medicine, and another thing so to arrange a prescription that the patient shall receive that dose. Very many of the mixtures containing solids in solution are so made up that the dose intended by the prescriber is not the one which the patient actually receives. This arises to a great extent from the circumstance that many members of the profession altogether overlook the fact that solids in solution add materially to the bulk of the liquid, and that to a much greater extent than is generally imagined. I believe I am correct in stating that the great majority of prescribers never consider that solids when dissolved add to the bulk of a mixture. This is a question which has not hitherto received the attention it deserves. Some years ago I was led to look at this subject and lately I have made some experiments with the view of ascertaining how much the bulk of fluids is increased by having solids dissolved in them I do not pretend that the following results are rigidly accurate, but they appear to be so very near the truth that for all practical purposes they may be regarded as a very near approximation to the truth. I experimented on a considerable number of substances, especially those that are most commonly prescribed in mixtures.

I shall now give some of the results obtained:—

One drachm of the iodide of potassium dissolved in a mixture will increase the bulk of that mixture by about twenty-five minims.

The following substances increase the bulk of a mixture to the same extent as the iodide of potassium, viz.: bromide of potassium, carbonate of potassium, bicarbonate of potassium, and nitrate of potassium; one drachm of the chlorate of potassium increases the bulk of a mixture by about thirty minims. The citrate of potassium increases the bulk of a mixture to the same extent. One drachm of the acetate of potassium dissolved in a mixture increases the bulk of that solution about thirty-five minims. The sulphate of copper does not occupy much space when dissolved in water, one drachm being equivalent to about twenty minims. The sulphate of iron occupies more space, each drachm when dissolved increases the bulk of the solution by fl℥ss. The carbonate of ammonia occupies very little space in a solution, one drachm being only equivalent to about ten minims, whilst one drachm of the chloride of ammonium is equivalent to about forty minims. One drachm of white sugar when dissolved in water increases the bulk of the water by about forty minims. One drachm of the hydrate of chloral dissolved in water increases the bulk by about half a fluid drachm. One drachm of the citrate of iron and ammonia increases the bulk of a mixture by about fifty minims, whilst one drachm of the citrate of iron and quinine increases the bulk of the solution by about forty minims. The sulphate of quinine when dissolved in an acidulated solution increases the bulk to the extent of its own weight. Thus one drachm of the sulphate of quinine dissolved in an acid mixture increases the bulk of that mixture by one fluid drachm. Camphor does the same thing. One drachm of camphor dissolved in rectified spirit increases the bulk by one fluid drachm.

These results are quite sufficient to prove that solids when dissolved in liquids increase their bulk to a very considerable extent and this fact ought to be borne in mind when writing prescriptions, otherwise the dose marked in the directions will not be exactly what the prescriber wished the patient to receive. Now there is a very easy way of getting over this difficulty and the only practical one, viz., to end our prescription by introducing the word *ad* before the last quantity named. This will inevitably enable us to give our patients the dose intended. Let me illustrate this by an example. It is no uncommon thing in certain diseases of the heart and blood vessels to give iodide of potassium in twenty grain doses several times a day. The following or some similar prescription being by no means uncommon:—

℞ Potassii Iodidi . . . . ℥ss.
Aquæ . . . . ℥vi
Sig. A tablespoonful three or four times a day.

The prescriber in such a case expects to give twenty grains of the iodide of potassium in every dose. If the prescription be accurately dispensed, instead of a six ounce mixture, the patient would receive fully a fluid drachm and a half more than the six ounces.

All prescriptions containing solids and liquids should be made up to a given quantity.

II. Prescribers should see that no two medicines in the same prescription are incompatible. The subject of incompatibility in medicine is a very wide one, and one at which I can only glance in this paper. Suffice it to say that there are two kinds of incompatibility in medicines, chemical and physiological, both of which as a rule are to be avoided in our prescriptions. Both of these primary divisions are capable of being subdivided, but the chief thing that the physician has to attend to is to make sure that there is no reason, chemical, physiological, or therapeutical, why any two substances should not be prescribed in the same mixture. I could illustrate this by many examples; I will content myself by mentioning only one, viz., lead and opium in the same solution. In almost all works on surgery we read of lead and opium lotions, but in few instances is a recipe given for such a lotion. I believe it was only last year that a discussion on this very subject engaged the attention of this Society, and I hope you will pardon me if I again refer to it, for on that occasion the true solution of the difficulty was not propounded by any of the speakers. When opium is added to a solution of a salt of lead we get a precipitate of the meconate of lead. If the solution be filtered the meconate of lead is got rid of, which is undoubtedly an advantage, inasmuch as the lotion is thereby rendered more seemly, whilst its action is in no way interfered with, inasmuch as the meconate of lead is an inert substance. In all such cases I prescribe a salt of morphia instead of opium. This gives a perfectly colourless solution, and possesses all the properties of the lead and opium lotion. It does not discolour the skin, and as a rule will be much more agreeable to the patient, which is a matter not to be overlooked. I am not only in the habit of always ordering a salt of morphia in all solutions of lead where it is desirable to add a sedative, but when a teacher of practical pharmacy in this city, several years ago, I was in the habit of teaching my students to do the same thing, and of practically demonstrating to them the differences in appearance between the two lotions.

III. The prescriber should always order his medicines in the most convenient form. Whenever there is a preparation in the B. P., which will serve the purpose of the prescriber, that ought to be preferred to any other, and of those contained in the B. P. the one most easily dispensed, *cæteris paribus*, is to be preferred. An imperfect acquaintance with the British Pharmacopœia is by no means an unfrequent cause of faulty prescriptions. I suppose you have all seen prescriptions defective in this respect. There are many preparations in the B.P. which seldom find their way into prescriptions, solely because medical men appear to forget their existence. I shall refer to a few of these. *Liquor zinci chloridi* is a preparation which is seldom seen in prescriptions, and yet it is the preparation which ought always to be ordered when we wish to give chloride of zinc in solution. This salt of zinc is not unfrequently prescribed in solution, and it is an exceedingly difficult thing for the dispenser to weigh accurately a few grains of the chloride of zinc, and it is seldom that more than a few grains are contained in any one lotion. The great hardness and extreme deliquescence of this substance render the duty of dispensing it neither an easy nor a pleasant task. In all cases we should order the liquor zinci chloridi. By so doing we would be much more certain that we had the exact quantity of the chloride of zinc in the mixture, and would at the same time render the duties of the chemist much more pleasant. The reason why this preparation is not generally prescribed is that medical men forget that there is such a preparation in the B. P. At the same time it is rather unfortunate that the strength of the B. P. preparation is such that it is a somewhat difficult task to calculate accurately a given number of grains. Had it only been a little more diluted, so that two drops of the liquor would have corresponded to one grain of the salt, all difficulty in this respect would have been avoided. The spiritus ætheris of the B. P. is another medicine which should be more frequently prescribed. It is much more miscible in solution than ether, and all that the prescriber has to remember is that he requires to order three times the quantity of the spirit of ether. Unless ether be mixed with spirit it will float on the surface of the mixture, and unless the person administering the medicine be very careful the patient is apt to get the greater quantity of the ether at the first dose.

In prescribing deadly poisons for internal use, such as arsenious acid or strychnia, the solutions of these substances are to be preferred to pills. Strychnia is given in doses of from one-thirtieth to one-twelfth of a grain, and it is evident, not to speak of the difficulty of weighing accurately one grain in the ordinary course of dispensing medicines, that there is always the danger of the strychnia not being equally divided throughout the various pills.

I shall next consider prescriptions in relation to pharmaceutists. Here I know I am treading on delicate and debatable ground, and I trust that any remarks I may make will be received in the same friendly spirit in which they are given, and that nothing will be said to mar that good understanding which ought always to subsist between members of the two professions.

I. Pharmaceutists are not to be the writers of prescriptions. So far as a knowledge of drugs is concerned, including dose, actions, and uses of medicines, they are quite capable of writing prescriptions, but they lack the essential element of a knowledge of disease to enable them to prescribe for patients. I suppose we all believe the doctrine that no one can prescribe accurately unless he is first able to diagnose disease and point out the proper remedy.

II. Pharmaceutists should dispense our prescriptions accurately. This may seem a mere truism, but it is a question about which opinion is somewhat divided; some contending that it is the duty of chemists to take into consideration not so much what is actually written as what the prescriber intended to write. It is only, however, in very exceptional cases that this rule ought to be followed. It is only when it is very evident that some mistake has been committed by the writer, that a druggist would be justified in not dispensing the prescription exactly as it is written.

Cases from time to time occur in which through a *lapsus pennæ* a mistake has been committed so serious that but for the intervention of the chemist results the most serious would inevitably follow. In such cases it is the clear duty of the dispenser to rectify the mistake.

Again, mixtures have been prescribed containing substances so utterly incompatible that they could not be safely administered to any patient.

III. It is the duty of pharmaceutists to tell us what substances are chemically incompatible. I have already spoken of chemical incompatibility in medicine as distinct from physiological incompatibility, and I maintain it is your duty to investigate this subject for us. Consequently you should never dispense a prescription without asking yourselves the question, Is this mixture one in which all the ingredients are compatible with each other? It is also your duty to discover the reasons of this incompatibility and to lay, from time to time, the results of your investigations before the members of the medical profession.

IV. It is your duty to tell us what is the best form in which to give any particular medicine, whether as a powder, extract, tincture, or infusion, etc.

V. It is your duty also to find out for us what are the active principles contained in the various substances of vegetable and animal origin. This is a wide and rich field for investigation and one in which very much requires to be done, and one, let me say, in which I hope some of the young members of the North British Branch of this Society will greatly distinguish themselves.

VI. It is your duty still further to find out what is the most agreeable form in which a drug can be administered, to find out how the nauseous taste of a medicine may be best covered without interfering with its action. It is often of considerable importance to be able to render our medicines pleasant and we look to you chiefly to enable us to accomplish this most desirable end. Let me say to the young men before me, you should never dispense a prescription without asking yourselves the question, Can this medicine, by any other combination, be rendered more agreeable without diminishing its efficacy; and if so, how?

I must now draw these somewhat crude observations to a close. I regret exceedingly that other duties prevented me from giving that attention to the subject which it undoubtedly deserves. I am also aware that I touched on some very debatable points, but I trust I have said enough to convince the young men present that much more is required of them than simply to be able to dispense accurately what the physician writes. If you would prove yourselves worthy members of the noble profession which you have chosen, you must not only have a good general education, but you must study botany, chemistry, and materia medica, and above all you must try and make yourselves adepts in practical chemisty, for only by so doing will you be enabled to advance your profession. You have many noble examples set before you in the members of the North British Branch; even in Edinburgh, there are members of your profession of more than a European fame.

"Lives of great men all remind us
We can make our lives sublime;
And, departing, leave behind us
Footprints on the sands of time."

BENZOIC ACID IN PHARMACY.*

BY B. ARCHER.

Within the past two or three years the comparative merits of the various anti-ferments have been pretty thoroughly discussed, and the result has been to place benzoic acid first on the list. At present its use is limited to only a few officinal preparations, but there is no doubt it may be advantageously used in quite a number. In the next revision of the Pharmacopœia I would suggest, among the additions, that of benzoic acid water (gr. iv. to Oi) and its substitution for water in such syrups, infusions, decoctions and mixtures as are specially prone to decomposition. The instances in which there could be objection, either chemical or therapeutical, to such substitution would be rare, as it is harmless and will not materially affect the taste, odour or colour of the preparations. While benzoic acid in the small quantity here suggested will not make very instable preparations permanent it will so increase their stability that they may be kept as long as it is usually desired to keep them.

* From the *American Journal of Pharmacy*, April, 1878.

Some have recommended salicylic acid as an antiseptic, but this will not do for general use on account of the colour imparted to mixtures containing the salts of iron, and, besides, as an anti-ferment it is not the equal of benzoic acid.

I have found the benzoic water especially useful in preparing solutions for hypodermic use. The small phials of such solutions carried in the pockets of physicians, and thus kept at a high temperature, soon undergo change unless protected by some antiseptic. It may not be out of place to say just here that physicians who do not have daily use for their hypodermic syringes are often annoyed by the packing becoming dry and consequently so contracted that the piston will not work smoothly in the barrel. This annoyance may to a great extent be overcome by the addition of a few drops of glycerine to each fluid ounce of hypodermic solution.

In extemporaneous pharmacy it is often more important that the diluent in mixtures should play the part of an antiseptic than that of a mere flavouring ingredient, for it is a fact well known to all observing pharmacists that many of the mixtures, emulsions, etc., dispensed by them must become unfit for use, especially in the summer months, before all is taken by the patient. In dispensing such mixtures benzoic acid water may well replace water or the medicated waters. I have substituted benzoic acid water for water with great satisfaction in preparing solution of citrate of magnesium, mucilage and syrup of gum arabic, Jacksons' pectoral syrup, and many other officinal and unofficinal preparations which I need not enumerate.

The present formula is a most expeditious method of preparing syrup. ipecac., but this is all that can be said in its praise. It should be changed or else that for the fluid extract so modified as to yield a handsome preparation when mixed with syrup. By adding two fluid ounces of the fluid extract to one pint of benzoic acid water, filtering upon twenty-six troy ounces of sugar, and making two pints of syrup when cold, a beautiful and permanent preparation is the result.

There can be no doubt of the fact that benzoic acid contributes to the preservation of cerates, ointments, and all unctuous substances, but whether or not the difficulty of stability is entirely overcome by its use and the smallest quantity necessary to accomplish it I am not prepared to say. It has been stated that the addition of 5 per cent. of powdered benzoin to powdered ergot will preserve without alteration its physical and medicinal properties. Acting upon this suggestion, I added two grains of benzoic acid, dissolved in a few drops of alcohol, to one ounce of powdered ergot, mixed thoroughly and spread the powder on a sheet of paper an hour or two to allow evaporation of the alcohol before bottling. Sufficient time has not yet elapsed to say whether or not the ergot is thoroughly protected by this treatment, but from its present condition there is no doubt that deterioration is at least greatly retarded.

The instability of sweetmeats, preserves, marmalades, etc., is annually a source of much annoyance to housekeepers. If sugar enough is added to prevent change during the summer months, when the jar is opened in December they find a mass of candied fruit; while, if to prevent this trouble, a smaller quantity of sugar is used a few weeks of hot weather will produce lively fermentation. Four grains of benzoic acid, dissolved in a little boiling water, added to each pound of preserves while yet warm, will protect them without imparting any "physicky" taste.

CINCHONA IN SIKKIM.*

From the annual report to Government we learn that the year 1876-77 has been a very busy and successful one on the cinchona plantation. The crop of the year consisted of 201,455 lb. of dry red bark, and 6326 lb. of yellow and pale bark, or 207,781 lb. in all. Special attention continues to be paid to the three methods of harvesting, namely, thinning, uprooting, and coppicing. The total amount of bark obtained by thinning was 57,365 lb.; by uprooting 129,711 lb.; and by coppicing 12,108 lb. Thinning is an operation intended rather to benefit the trees left behind than to secure a crop. The respective merits of uprooting and coppicing are yet undecided. Some years must pass before an opinion can be formed (1) as to how young trees will thrive when planted on land cleared by uprootal, and (2) as to the quality and quantity of bark that can be collected from the shoots of coppice stools. The experience of the year has, however, proved that partial coppicing is a failure, as the young shoots are then thin and sickly, and suffer from the shade of the overhanging trees. No further trial will be made of the Nilghiri plan of cropping by the process of renewing the bark under moss. It is found quite unsuited to Sikkim. During the year 406,600 plants of red bark (*Cinchona succirubra*) were planted out, namely, 237,400 (equal to about 87 acres) on the new or Sittong division, and 169,200 on the old Mungpoo division. The experiment of growing crown bark (*C officinalis*) has also not been successful, but the new variety (as yet unnamed) promises to do well.

* From the *The Gardeners' Chronicle*, April 20, 1878.

CARBONIC ACID AND THE ATMOSPHERE.*

Recent observations by M. Ebermayer demonstrate (1) that the air in a large forest is in summer nearly twice as rich in carbonic acid as free open air; (2) that forest ground in summer contains much less CO_2 than unwooded ground (the CO_2 formed by slow decomposition of humus in the close forest seems mostly to pass into the air, and is probably utilized by the leaves for assimilation); (3) that, with rise of temperature, the increase of CO_2 in arable ground is very much greater than in forest ground; and (4) that the spread and motion of CO_2 in the ground seems to take place very slowly, for in two places quite near together the amount of CO_2 may be very different. Among other bearings of these facts, the ground covering of a forest can have no important influence on the amount of CO_2 and lime in spring water, and unwooded ground may have a greater action in this respect. Again, animals living underground, *e.g.* foxes, naturally prefer the ground air of the forest, with its little CO_2, to the ground air of the open field, which has much more.

ADMINISTRATION OF DIGITALIS.†

A very interesting discussion lately took place, at a meeting of the Société Thérapeutique, on the therapeutic influence and mode of administration of digitalis in disease. Most of the speakers gave the preference to a cold infusion of the leaves over any other preparation, and were almost unanimous in condemning digitalin as being dangerous and unreliable, as it does not possess the diuretic properties contained in the leaves. Dr. Héraud, who brought the subject to notice, recommends the following preparation: Macerate, for twelve hours, twenty-five centigrammes of the powdered leaves of digitalis in two hundred grams of cold water. This is then strained, and the patient is directed to take it in five or six doses, in the twenty-four hours, at some distance from meals. This dose, he said, should never be exceeded, if we wish to avoid its poisonous effects; and the quantity he prescribes is quite sufficient to produce the full therapeutic action of the drug, beyond which it is needless to push it. Dr. Héraud considers digitalis one of the best diuretics known in affections of the heart; whereas it is useless where there is no cardiac lesion, as, for instance, in cirrhosis, albuminuria, etc.

* From *Nature*, April 25, 1878.
† From *The British Medical Journal*, April 27, 1878.

The Pharmaceutical Journal.

SATURDAY, MAY 11, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE ALLEGED IRREGULARITY IN THE SALE OF STRYCHNIA AT PENZANCE.

THE report of the public analyst for the borough of Penzance, which was forwarded by the Local Government Board to the Council of the Pharmaceutical Society, contained such grave charges against the chemists and druggists of Penzance, that it is not surprising to find further reference to it in the correspondence columns to the Journal. The letter written by Mr. C. B. ALLEN, with the advantage of some years' experience of the mode in which the chemists and druggists' business is carried on in Penzance, gives a direct contradiction to the statement of the borough analyst that "the Penzance druggists are in the habit of selling vermin poisons containing strychnine without taking the names of the purchasers," and at the same time furnishes convincing reasons for the belief that they do on the contrary conform to the requirements of the Pharmacy Acts in the sale of vermin powders containing strychnine.

Of course no chemist and druggist can well plead ignorance of the composition of BATTLE'S Vermin Killer, since the maker of this article has intimated to the retail trade that it contains strychnine, and that it consequently requires registration of sales; and though the time and trouble requisite for that is often a source of serious inconvenience, it is in certain districts, as our correspondent points out, a matter of business interest to the chemist and druggist to register the sales of this poison, independent of all considerations of compliance with the law on conscientious grounds.

The borough of Penzance is situated in a part of the country where there are such inducements to observe the law, for it appears that whenever foxes are poisoned in that neighbourhood some person connected with the hunt visits the druggists' shops to look over the sale of poison registers, with the view of ascertaining who has purchased vermin killer, and thus to gain a clue to the perpetrators of what they regard as a grave offence.

The pig and duck of Mr. COLLINS'S client we will take for granted came to an untimely end from eating a bait set with poison for the destruction, either of foxes or of the vermin that are so unwelcome in the farmyard, and if BATTLE'S Vermin Killer is used at the place in question, there is not much ground for surprise, for both animals are foul feeders, and will devour almost anything. But if that circumstance was to be used for drawing attention to any existing neglect of the poison regulations, it seems to us the proper course to have taken would have been to examine the sale of poison registers, and ascertain whether sales of vermin killer were entered. The statement that inquiries had been made, but nothing could be learnt from the druggists as to who had purchased poisons during the last few months, is far too vague to be much value in any respect, and as evidence that the Penzance druggists are in the habit of selling vermin killer containing strychnine without taking the name of the name of the purchaser it is totally worthless. It is indeed a violation of the decency which should characterize the conduct of a public official that such slender material should be made use of for casting imputations on any member or class of the community.

Still this is the sort of conduct that is too frequently presented to view by the public analyst. The simple performance of his legitimate work does not afford him sufficient scope for producing the sensational effect he too often longs for, and so he seeks to command notoriety at the expense of some of his neighbours. It is, we think, fortunate that the publication of the report and the discussion which took place at the Council meeting will enable the chemists and druggists of Penzance to deal with the charge made against them. The letter of Mr. ALLEN, which appears on page 902, is calculated to justify the expectation that this will be done, and although we thought it desirable not to take the initiative in offering any remarks on this subject we shall have pleasure in affording all the opportunity we can to the Penzance chemists and druggists to make known their repudiation of the charge brought against them by the borough analyst and to support Mr. ALLEN'S statement that they are not open to reproach in this respect.

THE ELECTION OF MEMBERS OF COUNCIL.

WE regret having moved the susceptibility of the President and Secretary of the Chemists and Druggists' Trade Association by suggesting the existence of some connection between that body and the election circular referred to in our editorial article last week. The President denies that the Association has endeavoured to influence voters, and the Secretary repudiates the idea that it has any such aspiration. We cannot quite recognize the validity of the objection to our remarks, for out of the eleven signatures to the circular, seven are those of the Honorary Secretary and members of the Birmingham Executive Committee, the other four are those of members of the General and London Committees, while of the three candidates recommended to the electors two are also members of the Birmingham Executive Committee, and the other is a member of the General Committee.

THE WEIGHTS AND MEASURES BILL.

A DEPUTATION consisting of the President of the Society, Mr. SANDFORD, Professor REDWOOD, and the Secretary, waited upon Mr. FARRER on Thursday morning, at the Board of Trade Office, to represent to him the objections to the proposed Weights and Measures Bill now before the House of Commons. The Hon. EDWARD STANHOPE, M.P., and Dr. ACLAND, the President of the Medical Council, were present and discussed the various points with the members of the deputation. We have reason to believe that measures will be taken to remedy the evils that it is considered would result if the Bill were to pass in its present form.

THE ANNUAL MEETING.

OUR readers need scarcely be reminded in this column of the three gatherings in connection with the anniversary of the Pharmaceutical Society to take place next week, namely, the Dinner of the members and their friends at the Grosvenor Gallery on Tuesday, the Annual Meeting in the Society's House, Bloomsbury Square, on Wednesday at noon, and the Conversazione in the evening of the same day, at the South Kensington Museum. We would remark, however, in order to prevent delay and disappointment, that the time has past during which tickets could be obtained from the Stewards, and that gentlemen wishing for them must now apply direct to the Honorary Secretary, Mr. RICHARD BREMRIDGE, 17, Bloomsbury Square. With respect also to the Conversazione we are pleased to be able to say that the difficulty which was under the consideration of the Council at its last meeting has been overcome, and that the Refreshment Department at the South Kensington Museum will be open for the sale of refreshments on the evening of the Conversazione from 9 to 12 o'clock.

COMMERCIAL JABORANDI.

PROFESSOR BAILLON has examined specimens of all the jaborandi which has been sold in the Paris pharmacies during the last two years. He states in the bulletin of the Linnean Society of Paris, that he finds three kinds; the first is *Piper* (*Serronia*) *Jaborandi*, now become very rare in commerce, and the other two are species of *Pilocarpus*, viz.: *P. pennatifolius*, Lem., and, especially at the Pharmacie Centrale of M. Dorvault, *P. Selloanus*, Engler. M. BALANSA also has observed this latter species of *Pilocarpus* employed at Assomption and collected for exportation to Europe as jaborandi. M. BAILLON has been able to compare it with the type of the 'Flora Brasiliensis' in the collections of Sellow in the Berlin Herbarium, and considers the identity to be absolute.

P. pennatifolius furnishes a very active jaborandi. M. HARDY has found pilocarpine in its fresh leaves, and it produces salivation and sweating. *P. Selloanus* is equally active; it produces a painful sensation in the pharynx. Can it, however, be considered certain that these are two distinct species rather than varieties of the same one? The answer would naturally vary according to individual views, and Professor BAILLON does not here answer it. *P. Selloanus* often has the inflorescence and the flowers themselves smaller than those of *P. pennatifolius*; but this is not constant, as is shown by the figure in the 'Flora Brasiliensis' itself. In this book (fasc. 65, p. 136, t. 30), *P. Selloanus* is distinguished by having two or three pairs of leaflets glabrous on both sides; slender pedicles six times as long as the buds and a very glabrous ovary; whilst *P. pennatifolius* has one to three pairs of leaflets, hairy chiefly on the veins beneath, linear-oblong, with the median and lateral veins prominent. The author also observes that in the former the bark towards the top of the branches is more yellow or of a pale brown. It is perhaps *P. Selloanus* that is grown in some hothouses under the name of *P. simplex*, but this cannot be determined without flowers, which it appears are much more rare than those of *P. pennatifolius*. Many leaves of *P. Selloanus* have four pairs of leaflets, and some fresh leaves of typical *P. pennatifolius* are entirely without any hairs on the veins both above and below. Possibly all the species of this genus possess the medicinal properties proved to exist in these two, which will be seen no doubt if the medicine keeps in vogue.

M. D. PARODI, of Paraguay, has informed M. BAILLON that the Picoda de la Trinidad, where BONPLAND collected the jaborandi, is not in Corrientes but in the environs of Assomption. M. PARODI recorded the plant in 1861 as a masticatory and sialogogue under the name of *Ibirà-tày*.

A CASE OF MIXED POISONING.

UNDER this title Mr. A. J. BELL contributes to the *Lancet* a report of a curious case of poisoning through a patient swallowing, instead of an anodyne mixture which he had sent her, a liniment containing—methylated belladonna liniment, nine drachms, tincture of opium, one drachm, and methylated soap liniment to two ounces and two drachms. After energetic treatment with the stomach pump, rectal injections of coffee and whiskey, galvanism, and artificial respiration, the patient recovered, but it was observed that notwithstanding the large dose of belladonna, and although the eyes were widely dilated shortly after the poison had been taken, it was ten hours before the delirium characteristic of belladonna poisoning manifested itself. Mr. BELL says that the bottle containing the liniment bore a red poison label, but it is fair matter for speculation how far he himself contributed to the unpleasant accident by giving a housemaid "plain directions" that the contents were to be "used as an epithem on hot flannels."

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The thirteenth general meeting was held at the Royal Institution, April 11, 1878. The President, Mr. T. Fell Abraham, in the chair. The minutes of the previous meeting were read and signed. The donations to the library were duly acknowledged.

Mr. R. G. Dempster was elected a member.

Mr. Michael Conroy, F.C.S., called attention to a report in the *Pharmaceutical Journal* of a discussion that had occurred at a meeting of Council of the Pharmaceutical Society, relative to the publication of papers read before provincial associations, and to the very commendable part which Mr. Shaw had taken in that discussion. He considered the members of the Association were indebted to Mr. Shaw for defending their interests. He therefore moved that a vote of thanks be given Mr. Shaw. The motion was seconded by Dr. Symes, supported by the President and Mr. Sumner, and carried unanimously.

Fungoid Growth in Chloroform Water.

Dr. Charles Symes said I wish to call your attention to a fungoid growth which I have found in aq. chloroformi of the British Pharmacopœia. It is a very unusual thing, insomuch so that we have always looked on chloroform as preventing such growths in other liquids when added to them in small quantity. The water was in a stoppered bottle exposed to a comparatively strong light, but did not appear to have lost anything of its pungency. The fungus differs in character from that described by myself as occurring in infusions (*Pharmaceutical Journal* for 1864), and also from those described by Dr. Pereira in the early volumes of that Journal. When first examined the filaments were not articulated or branched, but now septa have formed and fine fibrillæ branch off having a somewhat beaded appearance. On exposing it in a small unstoppered bottle, so as to allow the chloroform to evaporate, animal life developed, but on adding a few drops of chloroform it rapidly disappeared; the fungus, however, still appeared to progress in its development. I have it here under the microscope with a quarter-inch power; examined under a one-sixth of an inch objective there is no further structure revealed, merely greater magnification.

Chloroform.

Mr. A. H. Mason, F.C.S., read a paper on "Chloroform." After calling attention to the various methods for the production of chloroform, and the reactions as published in text books, the probable method of production on the large scale was explained. The object of the paper was to show that pure chloroform was chloroform obtained from whatever source it may be, and ultimately that what is called methylated chloroform is just as pure and reliable as alcoholic chloroform. The impurities found in chloroform and methods for detection were explained and demonstrated, and it was shown that the process necessary for the purification of chloroform prepared from methylic alcohol was such as to render it probably more pure than that prepared from ethylic alcohol, and the fact that it is now being largely used in preference would imply that it is as reliable in administration.

The various specific gravities published were enlarged upon, and attention was called to the fact that the latitude given in the British Pharmacopœia is prejudicial. Chloroform prepared strictly in accordance with the British Pharmacopœia has a sp. gr. of 1·497, whilst absolutely pure chloroform has a sp. gr. of 1·500. It was explained that the substance soon deteriorates when absolutely pure, and to obviate this the manufacturers add about one per cent. of absolute alcohol to preserve it, and this addition reduces the sp. gr. to 1·497, but the British Pharmacopœia gives the sp. gr. 1·49, thereby admitting the addition or presence of such a quantity of alcohol as would be prejudicial in administration. The American Pharmacopœia gives the sp. gr. 1·480, and for this reason most of the American chloroform is reported as adulterated and large quantities are imported from other countries.

Six samples were marked representing chloroform prepared from ethylic, methylic alcohols and acetone, and the members were invited to state the source from which the chloroform was obtained, but detection was impossible.

The only difficulty from a pharmacist's point of view was the fact that the British Pharmacopœia prescribes the use of ethylic alcohol in the manufacture, but this might be obviated in a new edition, in which it will be necessary to state definitely the sp. gr.

Mr. Mason said the subject was one of importance, and its facts would be appreciated by every chemist; at the same time from a medical point of view there would be imaginary responsibility. But from an economical standpoint, if it could be shown that the one is as valuable as the other, why should the national revenue benefit from the production of a substance which is used to alleviate human suffering in its most acute form. The labours of Sir James Simpson, to whom we are indebted for its introduction as an anæsthetic, were alluded to.

The President thought it would not be out of place to mention that to Mr. David Waldie, the first lecturer to the Association and one of its honorary members, belonged the honour of having suggested to Professor Simpson the use of chloroform as an anæsthetic. With reference to the relative merits of chloroform made from pure and from methylated spirit, he (the president) stated that he had been assured by physicians whose opinions were entitled to all respect that the effects of the two were not identical. He thought it not altogether impossible that by united representation the excise might be induced to arrange for the remission or reduction of the duty on spirit used for the manufacture of this important article.

Mr. Shaw said he had listened with pleasure to the paper which had just been read. It was interesting from both a chemical and pharmaceutical point of view. He well recollected the time of the introduction of chloroform as an anæsthetic in Edinburgh, by Professor Simpson, and the success which attended its administration. It was correct, as the president had stated, that Mr. Waldie was the first to suggest its preparation for anæsthetic use. The manufacture of chloroform for some years was almost exclusively carried on in Scotland, in consequence of the excise duty on rectified spirit being so much less there than in England, and no duty being charged on its exportation southwards. This circumstance virtually gave a monopoly to the Scotch manufacturers, which they have to some extent maintained, notwithstanding the equalization of the duty on spirit some years ago. He was scarcely prepared for the statement that it was impossible to tell the difference between chloroform prepared with pure spirit and that prepared with methylated. He was under the impression that the flavour of methylic ether was very distinct when tested in a certain manner.

Dr. Symes said that chloroform of equal purity is prepared by Messrs. Macfarlane and Co., to that of Messrs. Duncan and Flockhart and possibly by other makers. Chemically speaking there is absolutely no difference between chloroform prepared from pure and methylated spirit if properly purified, but he was not prepared to say that constitutionally there is none—none that can be detected by the human economy, this being a question for the medical man rather than for the chemist. The sulphuric acid test of the Pharmacopœia, as shown by Mr. Brown some years since, is incorrect. Impure chloroform is not appreciably coloured by agitation with sulphuric acid; the acid itself, however, is deeply so. Pure chloroform, on the other hand, when agitated with sulphuric acid, and afterwards carefully examined by reflected light, is found to possess a slight colour. The presence of a small quantity of alcohol considerably enhances the keeping qualities of chloroform, and as regards its detection Mr. Dott has shown that specific gravity is even more delicate than the molybdic acid test of Dr. Davy.

Messrs. A. C. Abraham, Michael Conroy F.C.S., E. Davies F.C.S., F. J. Mackinlay, R. Sumner, A. E. Tanner, and other members took part in the discussion, With a cordial vote of thanks to Mr. Mason for his able paper, which was carried by acclamation, the meeting was brought to a close.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, May 2, Dr. Gladstone, F.R.S., President, in the chair. After confirmation of the minutes, etc., the names of the following candidates were read for the first time: E. R. Budden, A. A. Drinkwater and J. Collins.

The President then called on Mr. SIDNEY H. VINES to deliver a lecture on—

The Chemical Aspects of Vegetable Physiology.—The investigation of substances which occur in the cells of plants has for a long time formed a favourite theme for chemists, whilst the decomposition of these substances has added largely to our knowledge of chemistry. It is strange that but few researches have been made in the direction of determining the reason of the occurrence of these substances and the part that they play in the economy of the plant. One of the most typical of these substances is chlorophyll. Chlorophyll, which occurs in nearly all plants, is essential to the function of assimilation, which consists of the decomposition of carbonic acid and the formation of starch in the cell, this process being accompanied by the liberation of oxygen. As early as 1690 it was observed by a French botanist that bubbles of gas were given off by green leaves submerged in water; it was next noticed that if the water had been previously boiled no gas was evolved. Priestley found that the gas given off by leaves in sunlight was of a "purer and better nature," *e.g.*, air which would not support combustion could be so purified by introducing a green plant and exposure to sunlight, as to be again capable of supporting life and combustion. The next point noticed was that some sort of proportion existed between the amount of "fixed air" (CO_2) present, and the "dephlogisticated air" given off. De Saussure then observed that this process was accompanied by an increase of weight in the plant. Our knowledge of the subject remained at this point till about 1837, when the circulation of starch granules was discovered and their development studied. Sachs next took up the subject and proved that starch grains are not formed in plants which are bleached from the absence of light, and that their formation in the chlorophyll corpuscles depended on the exposure of the plant to bright sunlight. Godlewski proved that if no carbonic acid was present, no starch grains were formed. So we have two sets of phenomena, namely, the evolution of oxygen with absorption of carbonic acid, and the formation of starch grains, for both of which three conditions are essential, viz., sunlight, chlorophyll, and carbonic acid. So we may justly conclude that the two sets of phenomena belong to the same function.

Starch is not the only product of this assimilation. In the onion we find no starch, but in its place another carbohydrate, grape sugar. Some experiments of Briosi which seemed to show that substances other than carbohydrates are formed, *e.g.*, oil drops, has been lately disproved by more exact observations of Godlewski. So that as far as we know the only substances formed as a consequence of assimilation are carbohydrates, and to their formation therefore the increase of weight of the plant is due. De Saussure found that a plant increased in weight 531 grm., whilst the carbon in the carbonic acid was 217 grm. These numbers fairly correspond with the increase, supposing the carbon to unite with hydrogen and oxygen to form starch, thus $C_6H_{10}O_5 = 162$ to $C_6 = 72$.

The next points are what is the function of chlorophyll? and what part does it play in the formation of starch? As regards the composition of chlorophyll we have but little information. There are at present several distinct views as to its proximate composition: one that it is a definite and distinct chemical entity, the second, that it is a mere mixture of colouring matters, or rather of two groups of colouring matters, one group being blue to which the name cyanophyll is applied, the other being yellow and termed xanthophyll. Another view supported by Pringsheim, Karl Kraus, etc., holds that chlorophyll is nothing less than the cyanophyll of other observers, whilst the xanthophyll is a distinct substance which is a product of the degradation or formation of chlorophyll, but forms no integral part of it. The same diversity of evidence prevails with the ultimate constitution of chlorophyll. According to Pfaundler it contains 0·37 per cent N.; other results give 7 per cent.; whilst a Russian observer, Timiriazoff, believes it to be an ammoniacal compound and has called it chlorophyllin. One point seems to be agreed upon by all observers, viz., that it contains iron in its molecule. The opinions which prevail as to its action are various. Wiesner thinks that the growing cells absorb CO_2 from the air; that the chlorophyll combines with the O, whilst CO unites with the elements of water to form carbohydrates: the chlorophyll in its turn is deoxidized, and the oxygen thus set free is evolved by the plant; so that according to this view chlorophyll acts as a carrier. Karl Kraus suggests that the process is one of reduction and that chlorophyll is formed by the combination of a substance, leucophyll (for whose existence there is no experimental evidence), with the products formed by the reduction of the carbonic acid absorbed from the air. The chlorophyll is then split up by the action of light into leucophyll and other bodies, the latter forming starch. The leucophyll recombines and so the process goes on continuously. According to Sachs, chlorophyll is a product of assimilation, and by the further action of light is converted into starch. By the action of purpurol on resorcin, colouring matters, more or less remotely resembling chlorophyll, have been formed. It is known, moreover, that carbohydrates can be oxidized into aldehydes and aromatic substances. From some experiments of Karl Kraus it is probable that some substance resembling an aldehyde exists in seedlings, while Gorup Besanez has detected pyrocatechin in plants. Some results of Karl Kraus seem to show that in seedlings an aldehyde and an aromatic substance unite in the dark to form ætiolin, but in the light to form chlorophyll. So that on the whole there is some foundation for the theory of Sachs, which may be summed up thus: that seedlings have the power of decomposing their stored up carbohydrates, forming acids and aromatic substances; the former are reduced to aldehydes uniting with the latter to form chlorophyll (or in the dark ætiolin), the ultimate product being again starch. If we trace out the probable destiny of the carbohydrates we find that one portion is used to build up the vegetable cell wall, and is there deposited as lignin, etc.; a second part combines with nitrogen to form protein, but of the seat of formation of this protein we have no idea; whilst a third portion is decomposed into chlorophyll for the newly formed parts of the plant. If any excess remains it seems to be stored up for another year. The lecturer then concluded this portion of the subject, merely pointing out how much remains to be done before conclusions can be arrived at with any certainty.

In the second part of the lecture Mr. Vines considered the origin of vegetable acids and their bearing on the first part of his discourse. Liebig and Mulder, from observations on the ripening of fruits, came to the conclusion that acids were the first products of assimilation, and from these the carbohydrates were formed. This theory breaks down under the test of experiment, and then the question arises, by what process are the acids formed in the plant if not by assimilation? Hoppe-Seyler, by the decomposition of sugar with alkalies in the absence of air, has produced formic acid and pyrocatechin. Karl Kraus has observed in the onion, which contains much grape sugar, that from the external dry scales much pyrocatechin can be obtained; these dry scales also have deposits of calcium oxalate, whilst the internal scales contain only sugar, so that here the sugar is decomposed into an oxalate and an aromatic substance. In the germination of leguminous plants a substance occurs, asparagin, which has much significance in vegetable physiology. It has been found that in the germination of the Leguminosæ the amount of nitrogen in the seed does not vary; the nitrogenous substance of the seed is oxidized into asparagin, with the evolution of CO_2. If the germination is in the dark the asparagin accumulates, but when the plant is exposed to light the asparagin disappears and the plant forms carbohydrates. It has been suggested that asparagin is formed by some process analogous to that of digestion. It is known that some seeds contain a peptic ferment, also that aspartic acid is formed when gluten is digested by the pancreatic ferment, so that the suggestion is not without some foundation. The lecturer concluded with some remarks as to the proximate composition of seeds, about which much uncertainty exists. It is stated that seeds contain much legumin. By some of Hoppe-Seyler's pupils legumin is said to be a sort of globulin. The solanin from potatoes is now believed to resemble asparagin rather than belong to the alkaloid family. Chenopodin, from the chenopodium, has been said to be identical with leucin. In concluding, the lecturer said that his principal objects had been to sketch the points of contact between vegetable physiology and chemistry and to point out the sort of information which the vegetable physiologist was most desirous of obtaining from the chemist.

The President said that in listening to the lecture three points had especially attracted his notice: (1) That the subject of vegetable physiology was of great interest from a chemical point of view; (2) that the subject was one of which the fellows very rarely heard anything; and (3) the very great clearness and ability with which Mr. Vines had introduced and handled the subject.

Dr. Gilbert could but agree with the President in thanking Mr. Vines for his lucid account of what is known, as well as for showing the lack of knowledge, and indicating the lines of work which it was specially necessary to follow up. Mr. Vines, though principally directing his attention to assimilation of carbon, had not omitted to refer to the assimilation of nitrogen, which from one point of view was even of greater importance. If he might suggest a line of research which would be of the utmost importance to agriculture, as well as interesting to the vegetable physiologist, he would recommend an investigation especially as regards nitrogen in plants from the seed upwards, belonging not only to the leguminous order but also to some widely different order, *e.g.*, a gramineous plant.

Mr. Kingzett could but notice how much speculation existed in the various theories which had been brought before the Society; in his opinion much might be learned by studying the products of chlorophyll when acted on by different reagents. He also called attention to the great want of analytical data in the papers of Hoppe-Seyler's pupils which Mr. Vines had referred to.

Professor Thistleton Dyer pointed out that for the study and elucidation of these processes all the delicacy of the histologist and all the analytical skill of the chemist were required. The subject could either be investigated by the vegetable physiologist from a morphological aspect or by the chemist who concentrated his attention on the products of the machine. The latter investigator was sometimes too apt to consider vital products as substances which could be split up by reagents; this method, although giving us much information as to the substances when dead, often furnished us with but little knowledge of their condition when alive. Some substances which were of the greatest importance to the chemist, etc., were of little interest to the vegetable physiologist and were viewed by him as mere excretions. Thus the cinchona alkaloids seemed to be merely casual concretions in the bark of some plants, and if the bark containing all these valuable alkaloids were removed the plant seemed none the worse. The great problems are, how does a plant get its living and how does it assimilate its food? It seemed to the speaker that chlorophyll brings up vegetable life to a point where fungoid growth starts. Thus if we cut through the stem of a tree we find the outside parts green, the inside parts white, and feeding on the nourishment afforded by the external layers.

Professor Church said that mucilage was transformed in a manner similar to starch; this was proved by experiments with the seeds of the flax plant, which contain mucilage but no starch.

Mr. Vines in reply thanked the Society for the kind interest with which they had listened to his lecture and reiterated his desire for the cordial co-operation of the chemist and the vegetable physiologist. With reference to Mr. Kingzett's remarks as to speculation, he would only say that the vegetable physiologists would only be too glad to build their theories on more facts when the chemists furnished them.

After a vote of thanks to Mr. Vines for his lecture the Society adjourned to May 16, when the following papers will be read:—1. The Action of Hypochlorites on Urea, by H. J. H. Fenton; 2. On the Behaviour of Metallic Solutions with Filter Paper; and On the Detection of Cadmium, by Thomas Bayley; 3. On the Action of Bromine upon Sulphur, by J. B. Hannay; 4. On the Determination of High Boiling Points, by T. Carnelly, D.Sc., and W. C. Williams; 5. On Essential Oil of Sage, by M. M. P. Muir and S. Suguira; 6. On High Melting Points, by T. Carnelly, D.Sc.

SOCIETY OF ARTS.

Electric Lighting.*

BY DR. PAGET HIGGS.

I feel that it is great good luck that I am among the first to bring to the notice of this Society, so great a pioneer in the application of science to industrial arts and manufactures, some details on the subject of electric lighting. This subject is not only now of the highest importance to certain technical classes, it also gives promise of development to matters concerning our lives as private individuals. As a mode of public illumination it has attained definite success.

Time was when subjects still in the domain of science were very far from industrial realization; to-day an invention or discovery is in the hands of the investigator in his laboratory; to-morrow it is universally applied, and the world wonders how it ever did without it in its absence. The railway and the telegraph are not very ancient inventions; there are still living many thousands who have travelled by stage-coach and thought ten miles an hour wonderful speed; and the telegraph is not yet a generation old. We all have heard of the telephone. We know that it can be used for five hundred miles or more on a practical telegraph line; two years ago, had we been told that we could hear our friends laughing a day's railway journey distant, we should have regarded our informant as indulging in tall talk. A few months ago many of us had never heard of the phonograph, now we know that we can effectually register speech.

With these precedents, how can we say that electricity, which is even now far removed from the *rôle* of a mere laboratory aid, may not, in perhaps some such short period, be a means of illumination generally adopted. At

* Paper read before the Chemical Section of the Society of Arts. From the *Journal of the Society of Arts*.

the present moment, as far as I know, there is no competition between our present means of illumination, namely, gas lighting and electric lighting. I use the term no competition, because these two illuminating methods have, at the present time, two distinct fields. Electricity is still at a disadvantage in its application to the lighting of small spaces, or where many small lights are required. Gas is not advantageous in the lighting of large spaces. It might also be said that it is under considerable disadvantages in the lighting of public thoroughfares; and that, when it is employed for the lighting of large engineering or open-air works, it is absolutely ineffective. By its aid, also, it is impossible to distinguish colours, however brilliant or perfect its light may be. It is well known that blue and green—unless the latter be a so-called gas-light green—cannot be distinguished in gas-lighted rooms. Further, even in large enclosed spaces, the use of gas is attended with a deterioration of atmospheric purity prejudicial to health. With the electric light, on the contrary, not only does the light leave the oxygen of the air unconsumed and uncontaminated, but, by generating ozone, it might be said to act as a purifier. That this generation of ozone is not inconsiderable is known to every one who has stood within a few yards of the electric light. For this reason alone we should look forward with increased interest to the probability of electric lighting in its domestic application.

In the course of this paper I shall endeavour to show the relative economies of electric lighting and gas lighting, as applied to manufacturing industries. But electric lighting, supposing that its economy would not be less than that of gas, would still have many and important advantages over gas lighting in certain cases. For instance, the intensity of its light admits of large works of an engineering or constructive character being carried on, practically, as well by night as by day. No method of gas lighting has yet attained this position. In silk mills, dye works, picture galleries, stores, etc., where to distinguish colours by night as by day enables the manufacturer or vendor to labour continuously, gas lighting must again give place absolutely to electric lighting; for by the electric light scenes are painted, rooms decorated, delicate colours assorted, and looms fed as well as by day.

The advantages of the electric light have also been found in shipbuilding, and with ships themselves upon the ocean; it is unrivalled for lighthouse applications, and it promises to afford a means to the submarine diver that daylight itself has not achieved.

In the fine arts, it will, undoubtedly, be used to illuminate our picture galleries, as it is now used to light portions of the Louvre at Paris. To photography it has given so much assistance that your sun-picture may be taken by this artificial sunlight at midnight. Of its use in war, in detecting the movements of attacking armies, the course of torpedo-boats, etc., it is unnecessary here to say anything.

The applications thus briefly noted are to be regarded as accomplished facts. In soliciting your attention to the description and details that follow, it is necessary to state definitely and decidedly that the application of the electric light to industrial purposes is no longer a chimerical idea, but that in consequence of the recent rapid marked improvements in electro-magnetic apparatus electric lighting demands the attention of every manufacturer and constructor, not only as a system of lighting superior to any other in use for his purpose, but because by it results may be had that have hitherto been unattainable.

Electric lighting, as a system for lighthouse illumination and experimental purposes, has been known for some years, but from the large space occupied by the magneto-electric machines, their cost, and the high motor power required to drive them, its practical use has been limited.

Going back to first principles, we have that of magneto-electricity as discovered by Faraday. His experiment with a bar of iron surrounded by a coil or spiral of wire, and the production of electric currents in the coil by approaching to or drawing a magnet from the bar, and the correlative laws, are well known. Pixii, in 1833, constructed the first magneto-electric machine, upon which Saxton and Clarke improved. With these machines an electric current was obtained by causing permanent magnets and coils of wire to revolve with their poles in juxtaposition. Nollet, of Brussels, improved and enlarged Clarke's machine, and modifications of this machine have been constructed by Holmes, of London, and the Compagnie l'Alliance, of Paris. In 1854, Dr. Werner Siemens, of Berlin, improved the revolving coil giving to all magneto machines with permanent magnets what may be considered at the present time as the final step in this description of machine. But electric machines with permanent magnets are disadvantageous in use, because increased dimensions (beyond certain limits) do not give increased electrical results.

Magneto-electric machines (with electro-magnets) of the present powerful construction are due practically to Dr. Siemens and Sir Charles Wheatstone, who, within a short period, independently discovered the principle of accumulation by mutual action. Taking advantage of the fact that iron always has a certain amount of magnetization said to be residual or remanent, these inventors cause a coil of wire to revolve between the poles of an electro-magnet which is in electrical circuit with the coil itself. Starting with the current induced in the coil by the residual magnetism, this current passes from the coil to the electro-magnets, making them more strongly magnetic, and giving rise to still more powerful currents in the coil.

Magneto-electric machines based upon this principle are now in use under two forms of construction. Of these forms I have only one to show you, namely, the Siemens machine. The machine invented by M. Gramme, of Paris, and extensively used in France, I do not purpose to describe, as the results obtained by both machines are so similar that a description of one will afford understanding of the other. However, in dealing with the question of economy I shall borrow largely from the published results given by M. Gramme, as aiding to show the advantages of electric lighting from the point of view of two independent sources.

In the latest form of construction of the Siemens magneto-electric machine, the armature, as the revolving coil may be called, consists of several lengths of insulated copper wire coiled in several convolutions upon a cylinder. The whole surface of the cylinder is covered with wire, laid on in sections, each convolution being parallel to its longitudinal axis. For about two-thirds of its surface the wire cylinder is surrounded by curved iron bars, there being just sufficient space left between these curved iron bars and the wire cylinder to allow of its free rotation. The curved iron bars are prolongations of the cores of large flat electro-magnets; the coils of these electro-magnets and the wire on the cylinder (from brush to brush) form a continuous electrical circuit. On revolving the cylinder (which is supported upon a longitudinal axis in suitable bearings, the axis carrying a pulley) an initially weak current is generated into its wires by their passage through the magnetic field formed by the residual magnetism of the iron cores of the electro-magnets, and the current being directed into the coils of the electro-magnets increases the magnetism of the cores, which again induce a stronger current in the wire cylinder. This mutual action may continue until the iron has attained its limit of magnetization. The maximum magnetic power acting upon each convolution is attained at every revolution of the armature, when the convolution passes through the centre of both magnetic fields, and gradually falls to zero as the convolution becomes perpendicular to that position. Each convolution has, therefore, a neutral position, and a convolution leaving that position on the one side of the axis and advancing towards the north pole of the electro-magnet, would be subject to a direct induced current, and that portion of the convolution on the opposite side of the axis would be traversed by a current of opposite direction, as regards a given point, but of the same direction as regards circuit.

Each of the sections of wire coiled upon the cylinder consists of two separate coils, leaving four ends; two of these ends are connected to each of the segments of a circular commutator divided into parts. But all the coils are connected to the several segments of commutator in such a manner that the whole of the double sections form a continuous circuit, but not one continuous helix.

Two brushes, placed tangentially to the segments of the commutator, collect the electric currents; these brushes are connected one to each electro-magnet, and the two free ends of the electro-magnet coils are connected to the conducting wires leading to the lamp.

The dimensions, weight, number of revolutions, made by the armature, light equivalent in normal candles, and h.p. required for driving, are for three sizes of machines as follows:—

Dimensions in inches.			Weight in lbs.	Revolutions of cylinder.	Candles' light.	H.P.
lgth.	wdth.	hgt.				
25	21	8·8	298	1100	1000	$1\frac{1}{2}$ to 2
29	26	9·5	419	650	6000	$3\frac{1}{4}$ to 4
44	28·3	12·6	1279	480	14,000	0 to 10

In the lamp which it is preferred to use with the Siemens machine, the points of the carbons after being separated are brought together again by the gravitation of the top carbon and its holder. The descent of the top carbon actuates, by means of the straight rack it carries at its lower end, a large pinion, the spindle of which carries a small pinion gearing into a second neck attached to the lower carbon holder, the superior weight of the top carbon and holder in conjunction with the multiplying ratio of the two pinions producing a continual tendency of the carbons to approach each other. The large and small pinions are connected to each other, and to the spindle that carries them, by an arrangement of friction discs, and the object of this construction is to allow of the two racks being moved equally and simultaneously up or down for the purpose of focussing the light when required. This movement is effected by means of bevelled gearing and actuated by a milled head which can be pressed into position when required. On the spindle carrying the large and small pinions and the friction discs is placed a toothed wheel connected with the spindle by a pawl and ratchet. This wheel is the first of a train of wheels and pinions driving a regulating fly in the usual way. The pawl and ratchet are provided to allow of the rapid distancing of the carbon holders when it becomes necessary to introduce fresh carbons. The spindle of the fly also carries a small finely toothed ratchet wheel. This ratchet wheel is actuated by a spring pawl, carried at the end of a lever, which lever is the continuation of the armature of the electro-magnet, in such a manner that when the armature is attracted by the electro-magnet the spring pawl engages in the teeth of the ratchet wheel and causes the wheels in gearing therewith to act upon the racks of the carbon holders to draw them apart.

The action of the lamp is as follows:—The current passes from the conductor to the top carbon holder, thence through the carbons to the bottom carbon holder, then to the coils of the electro-magnet situated in the base of the lamp. From the coils of the electro-magnet the circuit is completed to the other conductor. Upon the current passing through the circuit, the armature of the electro-magnet is attracted, and the abutment from the armature lever caused to short-circuit the coils of the electro-magnet, releasing the armature. The armature being released, the short circuit is removed from the coils of the electro-magnet, and the cycle of movement repeated; in this manner an oscillatory motion is given to the armature lever, which, by the spring pawl, actuates the ratchet wheel, the train of clockwork, and the racks of the carbon holders, forcing the carbons apart until the distance between their points sufficiently weakens the current, so that it no longer attracts the armature of the electro-magnet. Thus, by the combined action of gravitation of the top carbon in drawing the carbons together, and of the current to separate the carbons when they approach too closely, a working distance is maintained between the points with perfect automatism.

Magneto-electric machines have chiefly been employed for the production of the electric light, but they are also applicable for the transmission of power and for electro-metallurgical processes. In this paper we shall confine our attention to their use for the production of the electric light.

With regard to the improvements in recently constructed dynamo-electric machines, we learn from Professor Tyndall's report to the Elder Brethren of the Trinity House, that magneto-electric machines of old construction cost ten times more, occupied twenty-five times the space, and weighed fourteen times as much as the recent machines, while they produced only one-fifth of the light, with practically the same driving power; that is to say, taking light effect in each case into consideration, the new machines cost one-fiftieth, and are, as regards space occupied, a hundred and twenty-five times more advantageous than the earlier forms.

Against the use of magneto-electric machines for practical purposes, there has been quoted the disadvantage of stoppage due to wear and renewals, but in the present form of machines the chances of stoppage are no more than those that arise generally with machines of any ordinary construction. The Trinity House report, previously referred to, states that the Siemens machine then tried "worked well from the 7th March to the 7th April without any necessity for a stoppage. On the 11th March the commutator plates and brushes were again adjusted; and on the 6th April, the commutator plates and brushes were renewed."

The limit to the duration of the light is at present set by the size of the carbons and the rate of their consumption, which depends much upon the power and quantity of the current, and consequently upon the size of the machine employed. In the lamps, the lower carbon is eight inches, the upper carbon sixteen inches in length, and the holders are arranged to receive a round or square carbon of nine to twenty-one millimetres diameter or side. Eight to ten hours is the longest time of duration of the carbons. Attempts have been made to construct lamps with the carbons in the form of circular discs set edge to edge, and caused to revolve by clockwork in order to lengthen the duration of burning, and a lamp so constructed by M. Regnier has been said to have given good results, but the difficulty of obtaining homogeneous carbons may be considered to be insuperable to the practical introduction of this lamp.

I now come to the more interesting portion of my paper, that relating to the efficiency of electric lighting, and its comparison with methods of gas lighting. We may assume, I believe, without fear of contradiction, that gas cannot be manufactured under a cost, including working profits, of two shillings for one thousand cubic feet as an average price. A gas-burner of twenty candles' light will certainly consume six cubic feet of gas per hour. Eight thousand candles light would necessitate four hundred burners, consuming two thousand four hundred cubic feet of gas per hour, costing four shillings and nine pence. The cost of fixing gas pipes, burners, cocks, etc., at ten shillings per burner, pipes included, would be £200. Assuming three hundred working nights, with an average time for lighting of five hours per night, or fifteen hundred hours, and reckoning cost of renewals, repairs, and shifting with work in progress, to be included in an interest of twelve per cent. per annum, we have—

Interest on £200	£24 0
Cost of gas for 1500 hours . . .	356 5
	£380 5

If only five hundred hours were worked during the year the cost would be—

Interest on £200	£24 0
Cost of gas	118 15
	£142 15

The cost of a magneto-electric giving this light intensity, with lamp and steam motor and connecting wires, would not exceed £250. The cost per hour for carbons, coals, attendance, oil, renewals, etc., may be taken at two shillings per hour under the most unfavourable conditions. This gives—

Interest on £250	£30
1500 hours at two shillings . , . .	150
	£180

which is a ratio in favour of the economy of electric lighting of 2·1 to 1.

If five hundred hours' lighting be taken, the cost for the electric light would be £80, or in the ratio of nearly 1·8 to 1 in its favour. But this is not strictly a just method of estimating the value of the electric light, because the one lamp will brilliantly light a space which would be so badly illuminated by the distributed gas-burners that work could not be carried on except under great inconveniences.

An actual comparison of these methods of lighting may be made by referring to some data given by Messrs. Siemens Brothers from the system as employed by them in one of the departments of their telegraph works, which, previous to the introduction of the electric light, was imperfectly lighted with one hundred and twenty gas-burners. The imperfection of the light, and the progress of the work necessitated frequent alterations in the gas fittings. Each of the burners consumed six cubic feet of gas per hour at a cost of three shillings and nine pence per thousand. The cost of fixing gas pipes, including cost of pipes, burners, cocks, etc., for the whole number was £60; interest may be taken at 15 per cent., to include wear, tear, renewals, and removals, per annum. During extensive orders, day and night work are continuous, and one thousand hours' consumption per annum is below the actual expense.

Interest	£9 0 0
Cost of gas consumed	135 0 0
	£144 0 0

The one hundred and twenty burners will give only two thousand four hundred candles' light; actually, but a percentage of this is attained, and with steam or fog the gas jets are obscured. It is necessary to employ three lights for the three spaces to be lighted. Three machines, with lamps, conducting wires, and mounting, etc., cost £250.

Interest at 15 per cent. on £250 .	£37 10 0
Carbons, coals, attendance, renewals etc., for 1000 hours	35 4 0
	£72 14 0

This is an economy of 2 to 1 in favour of electric lighting; but, if the ratio of light intensities were adopted, the advantage would be as 6 to 1 in favour of electric lighting.

The economy varies with the motor power; the light is cheapest when water power is to be had, and most expensive when a gas engine is employed. At M. Dieu's workshop at Davours, with the Gramme machine, the cost per hour is one shilling and eleven pence, against two shillings for gas. M. Ducommun states that the electric light costs two and a quarter times less than gas light, when wear, tear, and interest are taken into consideration.

It must not be forgotten that, in calculating these relative costs, the gas is taken as supplied to other consumers than the works in question. If it were necessary to construct a special gasworks, requiring special technical knowledge and attention, where the waste products of the gas manufacture could not be utilized, the cost of the gas would rise to ten to twelve times that of electric lighting, and in many cases would be absolutely inapplicable under conditions where the electric light might be easily instituted.

Generally, one small machine will illuminate five hundred square yards of fitters' shops and machine shops, and two hundred and fifty square yards of weaving and spinning mills, etc., while in the open air, on yards, and landing places, two thousand square yards may be easily and brilliantly illuminated with a single lamp.

In the celebrated chocolate factories of M. Ménier, fourteen machines are employed, and these are so arranged that the electric light can be supplied to the drawing and dining rooms, conservatories, and gardens of the residence.

At Paris, the Chapelle-Paris goods depôt has been provided with the electric light, with an economy in the staff of twenty-five per cent., for the reason that work can be carried on so much more expeditiously.

The electric light is in use in Paris, also, in the magazine du Louvre, and the Avenue de l'Opera, the *Figaro* offices, the works of the new Grand Hotel, the Exposition Buildings, and nearly every important public building in course of construction.

In the erection of the Tay Bridge by Messrs. Hopkins, Gilkes, and Co., two machines were employed, distant three hundred yards from the lamps, which were three hundred yards apart. The cost of working, including motor power and attendance, was about one shilling and fivepence per hour for each lamp. When both lights were thrown in one direction, a newspaper could be read at a distance of two miles.

Messrs. Head, Wrighton, and Co., of Stockton-on-Tees, have employed the electric light for night work for about three months, during which time the interest on the outlay, superintendence, and cost of carbons was fully covered by the charge of one shilling per hour for a thousand candles' light.

These typical cases will serve to show that electric lighting supplies a long existing want in industry.

The methods of utilizing the current for light purposes are still somewhat crude, and there is much yet to be done before the electric light can be employed with comfort in illuminating rooms and halls of ordinary dimensions. A source of inconvenience is the want of chemical purity in the carbon rods, but this inconvenience is not apparent in the lighting of large spaces, and, doubtless, when an efficient means of tapping or subdividing the electric current has been devised, the electric light will take the position of gas lighting in every household. And, although the attempts to subdivide the current, so as to obtain many smaller lights, have only promised, but have not attained success, I believe I may conclude, as I have mentioned in the introductory remarks, that we cannot say how soon this may be brought about. Indeed, I have in the laboratories of my friends, both in England and France, seen arrangements in action that go very far to fulfil what is required, and I should not be surprised at any moment to learn that the difficulties have been overcome, and that the future means of illumination for all purposes would be electricity.

In utilizing the electric light, the lamp is sometimes, as in lighting large spaces, unprovided with glass or shade; in other cases opal and milk glass globes are used to soften the light; but both these methods cause fatigue to the eye, when the operator or workman has the habit of looking directly at the light. To obviate fatigue from the direct rays, it has been proposed to place the electric focus in a reflector, and to project the rays upon a whitened ceiling, or upon another reflector, so as to diffuse a soft and pleasant light throughout the room. This method would also be applicable for street lighting, in thoroughfares or public places where the direct rays might be considered inadmissible.

In this paper I have purposely omitted to make mention of the Jablochkoff lamp, or so-called "electric candle." The attention of the members of this Society has, I believe, been called to this invention. Although in use in Paris, I am not aware that it is employed in England. These candles have serious drawbacks. They can be used only with a machine giving alternate currents. Such machines, for equal light effects, require a larger expenditure of motor power than machines that give a permanent current; the consumption of carbon is greater than in an electric lamp; and these disadvantages will, I am afraid, interfere with the extended introduction of this system of electric lighting. To M. Jablochkoff is, however, due the merit of opening up a new era in this method of illumination, because he showed how very nearly practical results were at hand.

I may conclude this paper with a *résumé* of the advantages of electric lighting. In the first place, electric lighting can be economically employed, both with regard to its intensity and colour effect, where gas lighting or other modes of lighting are valueless. In lighting large workshops, stores, etc., electricity enters into competition with gas, both in economy and safety from fire.

I have to call the attention of the Society to the machine and apparatus put before them by Messrs. Siemens Brothers, and to thank you, Mr. Chairman, ladies, and gentlemen, for your attention to a paper that has unavoidably been fatiguing from the amount of detail it has involved.

Parliamentary and Law Proceedings.

Alleged Adulteration of Flour at Selby.

At the Selby Petty Sessions, on Tuesday, May 7, before Mr. B. Hemsworth, Mr. W. S. Smith, and Mr. J. Adams, Messrs. John Croysdale and Sons, flour millers, Whitely Bridge, who also occupy flour stores at Selby, were summoned on two separate informations under the "Sale of Food and Drugs Act, 1875," for having sold flour mixed with alum, in one sample equal to 18 grains of alum to 4 lb. weight of flour, and in another sample to 10 grains of alum to 4 lb. weight of flour.—Superintendent Gill, the officer appointed under this Act, prosecuted; and Mr. Heaton Cadman, barrister, appeared for the defence.

Mr. Cadman reminded the Bench that when the case came before them on the 15th of April a request was made under the Adulteration Act that a sample or samples of the flour which they were going to be told had been got from the stores of the defendants should be sent for analysis to the authorities at Somerset House. In accordance with that application samples were sent to Somerset House, and a report upon them had been received from the analyst there, and he wished to know whether Superintendent Gill, on the face of that report, proposed to proceed with the case. He said, advisedly, that if the case was proceeded with, after the report of the authorities in London, who were really the final court of appeal in a case of this kind, then the prosecution would assume an aspect of distinct malice or of some ulterior motive.

Superintendent Gill said that he had determined to go on with the case. Having been sworn, he stated that on the 11th February he visited the defendants' stores at Selby. He there purchased two samples of wheat from the manager, and numbered them 29 and 30 respectively. He sealed them and sent them to Mr Allen, West Riding analyst, at Sheffield, for the the purpose of obtaining his certificate after having analysed them. With respect to the sample numbered 30, the certificate was to the effect that it contained alum to the proportion of 18 grains to the 4 lbs. of flour. This was a smaller amount than was usually employed, the common proportion being about twice that found. Alum was added to inferior flour to improve the apparent quality of the bread made from it. In the proportion found he did not think it would render the bread indigestible. With respect to sample 29, the certificate was to the effect that it contained alum in the proportion of ten grains to four pounds of flour. This was a very insignificant amount, the usual proportion employed being about four times as great. In the very small proportion found alum would not render the bread indigestible. In accordance with the request of Mr. Croysdale he had sent the samples to Somerset House to be there analysed, and had received that morning the following certificate:—"The two samples of flour referred to in the annexed letter, and marked No. 29 and No. 30, were duly received, and the seals were perfect. We hereby certify that we have analysed the same, and declare that No. 29 contains alumina equivalent to 9 9-10th grains of ammonia alum per four pounds of flour; and that No. 30 contains alumina equivalent to 21 1-10th grains ammonia alum per four pounds of flour. The amount of alumina calculated as ammonia alum naturally present in flour examined by us has ranged from 2·0 to 10·3 grains for four pounds of flour. Sample 29, therefore, according to our experience contains no more alum than is found in genuine flour, and with regard to the excess of alumina in No. 30, the results of our experiments do not enable us to confirm that it exists in the flour in the form of alum. (Signed.)—J. Bell, R. Bannister, H. J. Helm."

Mr. Cadman said it was for the prosecution to make out their case upon that certificate. It said, "It contains no more alumina than is found in genuine flour." There was not a word about alum. Alumina, it was admitted, was found in flour; but there was no more in this flour than was usual.

Mr. Smith thought that what the authorities at Somerset House called alumina Mr. Allen called alum.

Mr. Cadman: But alumina is not alum.

Mr. A. H. Allen was then examined by Superintendent Gill, and said that he was public analyst for the West Riding, for the Northern Division of Derbyshire, and for the borough of Sheffield. He had read the certificates received from Somerset House, and in his opinion they were in accordance with those which he had given.

Mr. Cadman: The certificates speak for themselves. That is a matter of opinion.

Superintendent Gill: Have you had very extensive experience in the examination of flour? Yes. I have examined a large number of samples of bread and flour.

What is the greatest extent in which you have found alum in flour? I have had an instance of as much as 70 grains in a 4 lb. loaf. In flour, 30 or 40 grains in 4 lbs. weight is the largest amount I have found.

With respect to the sample No. 30, do you say that you found alum in it? Yes, distinctly. I found alum as distinguished from alumina. Witness, at the request of the Bench, said that he would call alumina the active principle of alum. There was a definite amount of it in alum, so that, having found so much alumina, one could calculate the amount of alum or *vice versâ*. Some chemists were content with simply finding alumina, but he used a test by which he could find the amount of alum. The Somerset House analyst had stated that the amount of alumina calculated as ammonia alum naturally present in flours examined by them had ranged from two to ten grains for four pounds of flour. He made an allowance for only two grains. Some chemists allowed eight or nine grains, but he believed there was no instance on record of more than ten grains occurring naturally. According to the Somerset House certificate one of the samples in question contained twenty-one grains of alumina, which was eleven grains in excess of the highest quantity ever known to occur naturally. He would not say that the amount of alum he found in the flour rendered it injurious to health.

Mr. Cadman called the attention of the Bench to the concluding words of the Somerset House certificates:—"With regard to the excess of alumina in No. 30 sample, the results of our experiments do not enable us to confirm that it exists in the flour in the form of alum." The flour was sent to them to ascertain if there was alum in it, and they had declared that they could not find it.

The Chairman: Was it sent for the purpose of finding alum in it?

Mr. Smith: It was sent, I presume, for the purpose of checking Mr. Allen's certificates.

In reply to the Bench, witness said that if the flour contained alum it had certainly been added to it. There was no such thing as alum in pure flour. There might be alumina in flour naturally. As he had already said, he made an allowance of 2 grains.

Mr. Cadman again asked the Bench whether upon the certificate from Somerset House they thought there was any corroboration of Mr. Allen's certificates.

Mr. Smith said that judging from the evidence then before them there was adulteration—

Mr. Cadman: Pardon me. But on this information there must be adulteration with alum. The information speaks of flour mixed with alum—ten grains of alum to four pounds weight of flour. It must be alum or nothing.

Witness in cross-examination by Mr. Cadman said that the samples of the flour sent to him were first made into bread by his servant. His test for finding alum was this—bread made of pure flour when put in a mixture of tincture of logwood and carbonate of ammonia turned a pink colour, and after being taken from the solution became a dirty brown. Bread containing alum, on the other hand, acquired a deep blue colour after undergoing a similar test. The bread in question acquired a blue colour, such as he had observed in the case of bread to which he had purposely added alum.

In answer to the Bench witness said that this was the first sample sent to him from the West Riding in which he had detected alum.

The witness was further cross-examined as to various other methods of analysis, after which the case was adjourned for a week.—*Leeds Mercury*.

Review.

THE ISLAND OF MONTSERRAT. ITS HISTORY AND DEVELOPMENT, chiefly as regards its Lime Tree Plantations, with a Short Description of Lime Juice and its Use as a Medicinal Agent, and as a Beverage. Carlisle: Hudson, Scott and Sons. 1878.

Every one knows how important lime juice is as a medicinal agent. Ten years ago an Act rendered it compulsory that every ship should take on board lime or lemon juice in sufficient quantity to serve out so much per day to every member of the crew during the voyage. The practical failure of the Arctic Expedition, which was entirely attributed by the Committee appointed to inquire into the matter to the oversight of those in command not taking a supply of lime juice on the sledges has again recently brought into very great prominence the value of lime juice as an antiscorbutic. The head-quarters of lime tree cultivation is now the little island of Montserrat in the West Indies. At the beginning of last century this, with a few other islands, had a monopoly of the English sugar market, consequently sugar was largely grown, and was a very profitable crop. The conquest of Trinidad and Demerara, at the beginning of the nineteenth century, opening up a cheaper field of supply for the home market, the Montserrat production gradually decreased, until, ten years ago, the export was only about 950 hogsheads, a third of what it was eighty years ago. At the time when "Sturge's Montserrat Company" was established, the whole of the northern part of the island had gone out of cultivation, and Montserrat had reached a very low point of depression. Now, the company just mentioned has 600 acres of lime tree plantations, and employs a large number of hands in collecting and manipulating the fruit. According to the 'Blue Book' for 1875, the recovery of Montserrat to its present state of substantial prosperity is to be attributed very much to the aid (while, of course, seeking their own advantage) afforded to industrious and energetic planters by the company referred to, and by local capitalists. With the brighter prospects of the island, the cultivation of the sugar cane has again been taken up, and a year's shipments now reach 2500 hogsheads.

The lime, *Citrus limetta*, a member of the orange family, is found in a wild state in many tropical countries, but does not flourish even so far north as the Azores. It is a thorny evergreen tree, with handsome dark green leaves, which are so fragrant that they are universally used in the West Indies to perfume the water in the finger glasses at dessert. The flowers, too, exhale a delicious perfume, but they are much smaller than those of the orange. The lime comes into full bearing about seven years from the planting of the seed, and grows best in light soil near the sea. Montserrat seems to suit it admirably, for the temperature there is remarkably uniform, the thermometer at night seldom falling below 69°, or rising, even at mid-day, above 90° Fahrenheit, with an average of 78° to 80°. The average rainfall is from fifty-four to sixty-four inches a year. The lime harvest is heaviest from September to January, but the Montserrat plantations yield a considerable return all the year round. The fruit is carried down to two central manufactories, where it is sliced by water power, and afterwards subjected to pressure until all the juice has been obtained. That from the choice fruit is headed up in casks, with as little delay as possible, and shipped to the English consignees, and that from the inferior fruits is boiled down for the citric acid makers.

A large quantity of lime juice is obtained from the fruit of the trees that grow wild in Jamaica, Tahiti, and elsewhere, but often little care is taken in its collection. The negroes in some parts of Jamaica gather the fruits they find under the scattered trees, and squeeze them into a pail with a wooden kitchen lemon-squeezer; the juice thus obtained is bought by the merchants for a few pence per gallon. In order to increase the bulk salt water is sometimes used as an adulterant. Besides, as lime juice decomposes very rapidly when exposed to the atmosphere in a tropical climate, it is not to be wondered at that many samples of the article in the English markets have a mawkish taste, which does not recommend them to most people.

In the elegant little *brochure* from which we have culled the above information are several chromos, giving an excellent idea of the beauty of the lime orchards, and graphic descriptions of the general vegetation of the island. It concludes with a list of the various lime juice products now to be obtained.

Dispensing Memoranda.

[54]. CREASOTE DISPENSING.—My experience certainly has not been so large as Mr. Martindale's, but I have dispensed very many prescriptions for mixtures containing creasote, and I also remember dispensing a prescription (℥vj mixt.) at the Square, given me to dispense by Mr. Haselden (and, by the bye, let me here add I found him a most courteous examiner), containing creasote, pot. bicarb. and tinct. camph. co.; so it is quite evident Mr. M.'s experience must be quite exceptional.

AN ASSOCIATE.

[54]. Creasote Dispensing.—I frequently dispense a prescription for a lady in which is ordered a mixture containing gtt. j. doses of creasote combined with tinct. camph. co. and sp. ammon. co.

B. Hunn.

[93]. Ext. Cinchon. Flav. Liq. and Potassii Iodidum.—May I be permitted to offer an improved form for this very inelegant compound?

I find the following a great improvement in appearance, and keeps without deposit.

℞ Ext. Cinchon. Flav. Liq. . . . . ℥iss.
Glycerini puri . . . . ℨvii.
Misce bene, et adde solutionem.

℞ Potassii Iodidi . . . . ℨii.
Aquæ . . . . ℨss.
Misce, fiant guttæ.

When one drachm is diluted with an ounce of water for use it turns rather cloudy, but does not deposit for some time.

I have tried J. B. L. M.'s method but did not succeed, for the flocculent deposit, although it would shake up at first, could not be moved from the sides of the bottle after twenty-four hours without great difficulty, and after violent shaking it came away all in a lump. On the second and third day it was much the same, and on the sixth day it had to be removed by a glass rod.

I observe in "The Month" exception is taken to the term resin of the bark, and I admit that it would have been more correct to have written the active principles of the bark as a resinous looking deposit.

On referring to the *Pharmaceutical Journal*, March, 1867, you will find a somewhat similar formula given by Mr. Hanbury under "Concentrated Medicines."

℞ Ext. Cinchonæ Liquidi,
Liquoris Calcii Chloridi . . . . āā ℥ss.
Misce.

Mr. Hanbury remarks that this deposits the resin of the bark for want of a suitable vehicle and recommends each to be diluted with water before mixing.

Returning to the original No. 93, I would only remark that as the liquid extract itself varies so much, and cannot be kept long without depositing, the mixture when dispensed would be to my mind a very unsatisfactory one, and I think it is very questionable whether the patient obtains the full effect of the bark.

George Brown.

Sandown, April 30, 1878.

[95]. Tinct. Sapo. Virid. Co.—In the Journal for April 13, under "Dispensing Memoranda" No. 95, allusion is made to Tr. Sapo. Virid. Co., and a suggestion that Tr. Verat. Virid. might be meant. This is an error. I append the formula in use for it.

Tr. Sapo. Virid. Co.

Sapo. Virid.,
Alcohol,
Oil Cade . . . . . . each 1 ounce.
Oil Lavender . . . . 1½ dram. Mix.

Tr. Sapo. Virid.

Sapo. Virid. . . . . 1 ounce.
Alcohol . . . . 2 ounce.
Ol. Lavender . . . . 1 dram. Mix.

Both the above are considerably used in skin affections, and are regularly dispensed as above under the titles given.

Sapo Viridis is the officinal soft soap of the 'German Pharmacopœia.' A note in the Druggists' Circular of March, 1878, will give some information on the subject of Sapo Viridis.

P. W. Bedford.

New York.

[102]. In mixing the ingredients of this mixture a white precipitate is produced consisting of citrate of bismuth. The supernatant liquid contains sulphate of magnesia, nitrate of bismuth, citrate, nitrate and sulphate of ammonia, and inf. calumbæ (the berberine of the latter combined with sulphuric acid?).

Citrate of bismuth is nearly insoluble but is easily dissolved by liquor ammoniæ or alkaline or neutral solution of ammonia salt. The smallest quantity of free acid added to a perfectly neutral liquor bismuthi will precipitate the citrate. If citrate of iron and ammonia is present neither free acid nor alkali will precipitate the bismuth salt.

W. H. Langbeck.

[103]. It is impossible to dispense the prescription in a perfectly clear state. If allowed to stand a few hours the first turbid mixture will get clearer. I do not think the liquid ought to be filtered.

W. H. Langbeck.

[104]. Oleum Palmæ Christi is identical with Oleum Ricini, *vide* Flückiger and Hanbury's 'Pharmacographia,' page 510.

W. H. Langbeck.

[104]. N. K. was quite right in sending castor oil. The doctor must be excused for his want of knowledge, and might be referred to Balfour's 'Class Book of Botany,' Pereira, and above all to Dr. Cauvane's 'Dissertation on the Oleum Palmæ Christi,' 2nd ed., 1769.

Hy. Brown.

[106]. G. F. W. would not be justified in using sodæ bicarb. instead of sodæ carb. or of subcarb. The sub. is often omitted. Many physicians prefer the subcarbonate of soda to any other form in catarrh. In the case of children, the subcarbonate is most usefully combined with vin. ipecac. and other expectorants. I think the rule should be to dispense a prescription in which sodæ carb. was an ingredient, as if it was written subcarb., unless the dispenser was acquainted with the mind of the physician, and knew his mode of ordering to the contrary. In the case of powders I would most assuredly give sodæ carb. sicc.; but if they were for use as an effervescent, then the bicarbonate should be used.

Sodæ carb. is often ordered with ginger, calumba, and rhubarb in powder, and in this case the dried sodæ carb. should be used. With the equivalent proportions between sodæ carb. and sod. carb. siccat., we have nothing to do at present.

Hy. Brown.

[106]. G. F. W. would be wrong in dispensing sodæ bicarbon. if sodæ carbonas is prescribed.

W. H. Langbeck.

[107]. Hoffman's Anodyne.—I beg to say to S. L., Belfast, that Hoffman's Anodyne is spiritus ætheris compositus, and differs from spiritus ætheris in containing ethereal oil. Squire is wrong in stating on p. 25, ed. xi. of his 'Companion,' that spiritus ætheris is called "Hoffman's Anodyne Spirit." I can find no proof for such a statement; but all authorities are against such statement, and it should be corrected. The date of Hoffman's Anodyne may be carried back into the early part of last century, and it is said he was taught its composition by an apothecary called Martmeier.

In the Ph. Lond. for 1836, it was called compound spirit of sulphuric ether, and in that of 1851, compound spirit of ether. The Edinburgh spirit of ether, or of sulphuric ether, the same as the B.P. preparation, has never been called by the name of Hoffman's Anodyne.

I observe there is considerable difference in the quantity of ethereal oil used.

Hooper's 'Dictionary of Medicine' gives :—Spt. of sulph.

ether, one pint; ethereal oil, two fluid drachms, M. Lond. Ph.: Æther. sulphuric, fl. ℥ eight; rect. spirit, fl. ℥ sixteen; ethereal oil, fl. drachms three, M. Stille gives: Ether half a pint, alcohol a pint, and ethereal oil six fluid drachms. The sp. gr. is 815.

Wood gives the same formula, and adds: "Hoffman's Anodyne is sometimes offered for sale without the ethereal oil. Forty drops of the genuine preparation will render a pint of water distinctly milky; but if no oil of wine be present, milkiness will not occur."

Hoffman's Anodyne seems to have a more persistent effect upon the system that ether or spirit of ether; but the true mode of action of ethereal oil is still unknown. Hoffman's Anodyne is very useful in hysteria and other nervous affections, and the apothecary is not justified in following Squire's authority and substituting spirit of ether for spt. æth. comp.

If it is a crotchet of the Messrs. Squire that no good is gained by the addition of ethereal oil, the sooner they are disabused the better, and all who possess the 'Companion' should write the correction.

When a book gains such a position as to be in the eleventh edition, such a paragraph as a synonym for spt. ætheris should not appear as this: "U. S. spiritus ætheris compositus, with ethereal oil." Surely, the Americans copied the mode of making Hoffman's Anodyne from some of our pharmacopœias, and why in Squire's 'Companion' a proper formula is not given, but one that may mislead a student or chemist, I do not know. The "Memoranda columns" will do vast good in checking such mistakes as calling Liq. Hoffmani simple spiritus ætheris.

Henry Brown.

Northallerton.

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[107]. Hoffman's Anodyne.—I always dispense Sp. Æth. Sulph. Co. made as follows when Hoffman's Liquor Anodynii is ordered, and I think it correct:—

℞ Ether . . . . ℥viij.
Rectified Spirit . . . . . ℥xvj.
Ethereal Oil . . . . ℥iij.
Misce.

An Associate.

Exeter.

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[107]. Liquor Hoffmani.—In reply to query 107 in last week's Journal, the spt. æth. sulph. co. should be used for Liquor Hoffmani. The following may be found in Dr. Collier's review of the Pharmacopœia in 1840.

℞ Sulph. Æther. . . . . . . ℥viij.
S. V. R. . . . . ℥xvj.
Ol. Æther. . . . . ℥iij. M.

Synonyms—Hoffman's Anodyne Liquor, Liquor Anodynus Mineralis, vide supplement, page 17.

Jno. Hurst.

Louth.

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[107]. For the information of your correspondent S. L. in this week's "Dispensing Memoranda" of *Pharmaceutical Journal*, I beg leave to hand him formula for Liq. Hoffmani according to Dorvault.

"Ether sulfurique, alcool à 90°, āā P. E. Mêlez (Codex).

"L'Esprit d'éther sulfurique composé, Liqueur nervine de Baug; sp. æther comp. (Lond.) est composé de: éther sulfurique, 192; alcool 384; huile douce de vin 9. Il est donné comme représentant la véritable liqueur d'Hoffmann. Edimb. supprime l'huile douce.

"Dose: 1 à 10, 0 dans un liquide approprié."

G. W. Stephens.

Hereford.

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[107]. Liquor anodynus mineralis Hoffmanni seu spiritus æthereus of the Pharm. German., is the same as spiritus ætheris of the Brit. Pharm.

(Spec. gr. 0·808 – 0·812).

W. H. Langbeck.

[108]. Can the following be accurately prepared so as to make a clear solution, and if so, how should it be mixed?

℞ Acid. Salicylic. . . . . ℨss.
Sp. Vini Rect. . . . . ℨiv.
Glycerin. . . . , ... ℨvj.
Aqua . . . . ad ℥viij.
M. ft. gargar.

The above has been sent out by two West-End houses perfectly clear.

A Novice.

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[109]. Would some reader experienced in preparing phosphorus pills, kindly state how the following could be prepared so that the pills, when completed, would not appear larger than an ordinary four grain pill?

℞ Phosphori. . . . . gr. $\frac{1}{30}$
Quiniæ Sulph. . . . . gr. i.
Ferri Redacti . . . . gr. iij.
M. ft. pil.

Apprentice.

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[110]. Will any reader kindly give the best method and quickest way of dispensing the following, as all attempts on my part to produce a permanent emulsion have failed.

℞ Ol. Terebinthinæ . . . . . ℨiij.
Acid. Acetic. Fort. . . . . . ℨv.
Aquæ Rosæ . . . . ℥iiss.
Ess. Limonis . . . . ℈iv.
Vittelli Ovi. . . . . j.
Ft. emulsio.

Apprentice.

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[111]. Resine Copaibæ.—Can any one inform me how this prescription can be prepared? It was sent to me today from one of our leading physicians.

℞ (*sic*) *Resin.* Copaibæ . . . . . . ℨiij.
Syrupi Gummi . . . . ℥j.
Ether. Chloric. . . . . . . ℨj.
Aquæ . . . . ad ℥viij.

M. ft. Mist. Sig. ⅛th part with ℥ss. aqua added three times a day.

Devonia.

Notes and Queries.

[592]. LIQ. SANTAL. FLAVÆ CO.—The product to mix clear with water. A formula for this preparation will oblige.

O.

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[593]. PERFUME FOUNTAINS.—J. P. requires some information respecting Perfume Fountains, and how to make them.

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[594]. BROWN DYE.—Can any one oblige me with a form for making a good brown dye for leather?

Aniline dye has been tried but failed.

S. W.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Sale of Strychnia in Penzance.

Sir,—From the fact of having served my apprenticeship in the oldest established business in Penzance, one which boasts of being a centenarian, I am naturally much interested in the report which has been brought to the notice of the Council by the Local Government Board, and which at the instance of the analyst for the borough of Penzance, Mr. J. H. Collins, implies a serious charge of neglect on the part of the whole pharmaceutical body in that town.

I had been an apprentice about twelve months when the Pharmacy Act of 1868 was passed, and although at first there was some little doubt as to whether or not Battle's Vermin Killer came within the meaning of the first part of Schedule A, a few weeks sufficed to prove that it did, and from that time until the expiration of my apprenticeship its sale in the establishment to which I allude was always faithfully registered. All other poisons were sold "in conformity with the Act," and though it is now more than five years since I left there I feel sure that the Penzance chemists will be fully able to defend themselves on the question at issue, and will do so without loss of time.

Comparatively speaking but very little poison is sold in the borough, the market town of a large district. Strictly, however, it is not agricultural in the sense which we understand the Midland Counties to be, the greater proportion of the land in West Cornwall being devoted to market gardening, and therefore large quantities of poisons are but seldom required.

Red lead and sulphate of copper have perhaps the largest sale. Corrosive sublimate and arsenic are sold only rarely, and in small quantities.

I am perfectly sure that no chemist in Penzance would think of selling strychnia, or any other such virulent poison, without complying in every particular with the requirements of the Act.

It frequently happens, in hunting districts especially, that the small farmer shows such utter disregard for "sport" as to lay a poisoned bait for the fox which has thinned his poultry yard, or possibly as a mode of showing personal spleen to the members or master of the hunt. For the latter cause no apology can be given; the former will always be a vexed question as long as there is a fox in England.

The poison invariably employed in such cases—I speak exclusively of West Cornwall now—is Battle's Vermin Killer, as it is in fact the only one which can easily be used by the tenant farmer for such a purpose.

If ever suspicion was formed that there was something wrong with the foxes, it was the custom of some person or persons connected with the hunt to pay a visit to different pharmacies in the town and ask to look over the poison register, and from the relation in which the proprietors stood to them, they being representatives of the landed interest in the county, the chemists could scarcely refuse their request.

I well remember undertaking the analysis of the stomach of a foxhound, one of several which had died under suspicious circumstances. The mode of analysis I employed was one which had not long before appeared in the Journal I was successful in detecting strychnia, and, moreover, the stomach was so thoroughly blue as if from the presence of colouring matter, that I was convinced that Battle's Vermin Killer had been the cause of death. A reward was offered for the detection of the culprit, but no one was discovered.

I have little doubt but that the poison was intended in that instance for the fox, but unfortunately it was the means of destroying some valuable hounds.

Much more might be said on the question, but probably I have written enough to prove that it becomes a matter of business interest to a chemist in a district, like the one involved, to register his poison sales, even setting aside the desire of every conscientious man to act according as the law directs.

There must be many chemists who have a similar experience and it is a question of some interest as to how far they are justified in producing the poison register when asked for it, and to whom is granted the authority of insisting on its production.

If Mr. Collins's client's pig and duck have both died from the effects of strychnia, it is more than likely that they have fallen victims to a bait set by a would-be vulpecide, or for badgers, weasels, and other such unwelcome farm-yard visitors; or what is still more reasonable to suppose, as suggested by Mr. Bottle, they have partaken of a rat or a mouse which has died from the effects of "Battle." Ducks eat mice readily, and pigs are never very particular.

I shall be anxious to know the outcome of so vague a report as Mr. Collins's, one which seems founded on indefinite supposition, rather than matter of fact inquiry.

CHARLES B. ALLEN.

London, N.W.

THE ELECTION OF THE PHARMACEUTICAL COUNCIL.

Sir,—Your leading article upon Saturday last contains some remarks upon the election for members of the Council, which I feel I cannot allow to pass without notice. You are pleased to speak of the Chemists and Druggists' Trade Association, of which I have the honour to be the President, as the "Birmingham Association," and to style it as the "latest development of pharmaceutical organization." I also consider your article is calculated to convey an impression upon the minds of your readers that the "Association" had endeavoured to influence the voters at the election of members of the Pharmaceutical Council. This I beg to say is not correct. As an Association we have not taken any part in the election; every member has been free to take any course that he may consider desirable, or that may tend to advance our common interests.

S. U. JONES.

Chirton House, Leamington,
May 8, 1878.

Sir,—I was somewhat surprised to observe in your editorial on "The Council Report," published in the last issue of the Journal, that you charge the Chemists and Druggists' Trade Association with aspiring to exercise electioneering influence in the forthcoming elections of the Pharmaceutical Society.

I take the earliest opportunity of repudiating this assertion; no such action has been taken by the Association. Until I received a copy of the circular to which you refer, I had no knowledge that such a document was about to be issued.

W. F. HAYDON,

Secretary, Chemists and Druggists' Trade Association.
Birmingham, May 7, 1878.

THE ELECTION OF WOMEN AS MEMBERS.

Sir,—I observe that the following notice of motion is down for the annual meeting of the Pharmaceutical Society.

"That all persons being duly qualified (irrespective of sex) shall be eligible for admission into the Society in accordance with the bye-laws thereof, and this meeting is of opinion that ladies should not be excluded from participation in the privileges of the Society."

Being unable to be present at the general meeting, permit me respectfully to submit, that however much personal feeling may have been averse to the recognition of women as members of the Pharmaceutical Society, I could not allow it to weigh, for a moment, against the intrinsic merits of their claim. If they have satisfied the Boards of Examiners, securing thereby "registration," to debar them from the privileges consequent upon their respective certificates of qualification is manifestly illogical and unjust.

C. PIERSON, A.P.S.

Leeds, May 7, 1878.

THE WEIGHTS AND MEASURES BILL.

Sir,—I do not see why Mr. Wilkinson need be so alarmed at the above Bill, for had he applied to any M.P. he would have been furnished with a copy, and then he might have read for himself (page 30) "Measures for the Sale of Drugs," and if this does not mean our graduated measures, then I should like to know what it does mean. Then as regards the weights, he will see (page 31) that instead of there being no standards for weights from two grains to ʒi, there is quite an array of standards from 56lb. down to $\frac{1}{2}$ (avoirdupois) dram, and decimal grains from 4000 down to ·01. The principal inconvenience is in the omission of the 60-grain weight, and on this item I had an interview with Mr. A. Pell, M.P. (one of the Select Committee), and he promised to try and get the Board of Trade to include it in the list. If we have not the scruple weight in the Bill, we have twenty grains, and what is to prevent Mr. Wilkinson calling it a scruple if he chooses to do so? There is no argument for quoting prices by ʒ, as this is now an obsolete weight; but prices may be quoted by the avoirdupois dram, and as it is usual to buy by that weight in larger quantities, why should there be an exception? It must be admitted that a concession is made in providing "metric" standards, and this should prevent factious opposition to what is on the whole a good Bill.

WILLIAM THIRLBY.

2, *Highcross Street, Leicester.*

[*** So far as our correspondent's opinion is based upon the assumed occurrence of the words "Measures for the Sale of Drugs," in the Schedule on p. 30 of the Weights and Measures Bill, it has no support in fact, for those words have been erased by the Select Committee, and the Bill as it stands does not appear to contain any provision for allowing the use of the minim, fluid drachm, or fluid ounce measures.—ED. PHARM. JOURN.]

THE SALE OF PATENT MEDICINES.—A PRACTICAL SUGGESTION.

Sir,—There can be no doubt that the ruinous competition of co-operative companies and others is snatching the sale of patent medicines out of the hands of chemists and druggists. That this is an injustice to us, I think no one can fairly deny. It amounts to this, that we the chemists and druggists who have served an apprenticeship and passed examinations in order to become the proper and legitimate dealers in and compounders of drugs, are to be opposed by persons and companies, most of whom carry on other businesses, and who simply by taking out a patent medicine license and underselling us, are able to withdraw from us the bulk of our trade—for half the world is now physicked by patent medicines.

What then is to be done? To attempt to compete with these parties, who only regard the patent medicine trade as a small branch of their system, and who can afford to take 5 or 10 per cent. profit on their turnover, would be merely an act of mercantile suicide; while to remain passive is to court a slower but no less certain destruction. Many of your correspondents have urged that the Council should endeavour to pass an amendment to the Pharmacy Act, in order to secure the sale of these medicines to chemists only, and there is little doubt that if this could be accomplished our difficulties would be almost at an end; but legislation of this kind does not always favour its promoters, and I think that some reasonable assurance of success should be obtained before the attempt is made.

I think that a different course should first be tried. I hold a firm conviction that if a good majority of the retail trade would only combine together we should be able to stamp out this wretched competition. Why should patent medicines ever find their way into the warehouses of co-operative stores and cheap-jacks? Let the trade demand of the makers of patents that they shall not supply their preparations to any of those people who notoriously undersell us, nor to any wholesale house who will not give a distinct undertaking to act on the same principle. The chemists' trade protection society might carry out such a scheme—make a canvass of the wholesale trade and make out a list of those who would and those who would not accede to such a request. We could then deliberate on a course of action with a view to isolate the black sheep, whether makers or wholesale houses. With regard to the former, we might agree not to recommend their goods even in the most qualified terms (and the chemist's recommendation is worth something); as for the latter, who are of course the chief offenders, we could easily cut them off by declining in a body to have any dealings with them whatever.

Some considerable opposition would of course be experienced, but if we were really united, I feel sure that we could so far carry the day as to be able to snap our fingers at the "stores," grocers, tailors, and all the wretched lot of adventurers who, like parasites, always endeavour to live on other people.

W. T. R.

"NOT ONLY PATENT MEDICINES, BUT GENERAL PHARMACY IS COMING TO GRIEF!"

Sir,—The letter I ventured to write you a fortnight since "to show the reed on which they leant" who deemed the Council could find them a panacea for the frightful competition to which they are subject by the sale of "patents" and drugs at little more than nominal profits, not only by co-operative stores, but by traitors in their own ranks, evidently contained some home truths. Home truths are generally unpalatable and unacceptable to those to whom they are addressed and whom they concern, and instead of any attempt being made to refute my statements, recourse is had to the old formula, "No defence, abuse the opposing party." Hence I am denounced as "sarcastic," guilty of "gross presumption" and writing "rigmarole," which Mr. Martin's "time is too valuable to follow through" (!) I will not rate my time too valuable to notice his remarks, nor will I be so rude as to call them "rigmarole." Mr. M. says "it is quite enough to have foes without the camp, we ought to be united and sympathetic within." "The three tailors of Tooley Street" were unsurpassed in their unity and their mutual sympathy, but history does not record that they accomplished much. I am afraid history will not record that Mr. Martin accomplished more. The grievance is admitted on all sides to be great, and by most deemed irremediable, but Mr. Martin's profound penetration has discovered a "remedy." It is that the druggists in each town should combine to have a mutual agreement as to prices! If this be not an instance of a "parturient mountain producing a muscipular abortion," let Mr. Martin prove the contrary by inducing "fraternal agreement" among the druggists not of "each town" but of my town only, of the present condition of the drug trade in which I gave him, in my "rigmarole," a precise and lucid description. Mr. Martin seems not to know that it is one thing to bring horses to water and quite another to make them drink.

I recommend Mr. Martin and others who, like him, are "leaning on a broken reed," to read the sensible remarks in a letter signed "Ictus Equi" in this week's Journal, and the no less sensible advice in Mr. Frazer's admirable address at Glasgow, who points out that "there is little use in barking if you can have no possible hope of biting," and I further recommend him if he write again on the subject to make at least some slight attempt at ratiocination, instead of ignoring all argument, and in place thereof applying unpleasant nouns and adjectives to those who differ from him.

I regret exceedingly if I said anything in my last calculated to wound the susceptibilities of "Sussex," whose anonyme I suggested might be "Senex," simply because he alluded to such a far off past that I concluded he must be an old stager. Though "variety" is said to be "charming," —and if so after fifty years, it might fairly be supposed that he would relish a change,—he seems still so well pleased to stand behind a counter that, instead of regretting his being obliged to do so, I congratulate him on his evidently possessing that "contented mind" which is said to be "a continual feast."

HAMPSHIRE.

The Sale of Patent Medicines.—"*Chemicus*" thinks that chemists and druggists have themselves to blame, they having given "other trades" the initiative as regards "low prices." Years ago he was frequently told by customers that they could get patent medicine and other proprietary articles much cheaper than the printed price on packages, and he thinks there is still too great a desire amongst chemists, and even pharmaceutical chemists, to undersell their neighbours, both in dispensing and also the one hundred and one articles kept by them. He thinks there has been too little combination and friendliness, and too much petty jealousy, and that it rests with the younger branches of the business to mark out a different and broader path for their future career, the old hands being, he is afraid, too stereotyped in their narrow groove.

J. C. is requested to comply with the rule as to anonymous communications.

G. S.—Bentham's 'Illustrated Handbook of British Botany,' published by Reeve and Co.

T. Hope.—(1) *Lamium Galeobdolon*; (2) *Valerianella olitoria.*

A. C. Goodchild.—Agathea cœlestis.

T. C. Blaymire.—Paris quadrifolia.

"*Pharmaceutical Student.*—Tomes's 'Manual of Dental Surgery,' published by J. and A. Churchill.

E. George.—Oxide of chromium.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Gibbons, Dr. Cauvet, Mr. Street, Dr. Hesse, Mr. B. Squire, Mr. Roberts, Mr. Reynolds, Mr. Kimmington, Diamond Capsule Company, J. P. R., Pestle, Rainbow, Mentha.

THE ANNUAL DINNER.

The Seventh Annual Dinner of the members of the Pharmaceutical Society and their friends was held at the Grosvenor Gallery on Tuesday evening. The company was very numerous, and amongst the guests present were The President of the College of Surgeons (Mr. John Birkett), The President of the Medical Society (Professor Erasmus Wilson), The President of the Chemical Society (Dr. Gladstone), The Medical Officer of the Local Government Board (Dr. Seaton), Professor Williamson, Dr. Swaine Taylor, Professor Odling, Dr. De Vrij, The Dean of the College of Preceptors, Dr. Ramsay, Dr. Leared, and Dr. Langdon Down.

The usual loyal toasts having been given and heartily responded to, the President proposed, "The Army, Navy, and Reserve Forces," coupling with the toast the name of Dr. Ramsay.

Dr. Ramsay, in responding, said that if unhappily war should break out it would be found that never in our history had the Army and Navy been better qualified and prepared than at present; as for the Reserve Forces, he saw so many around him belonging to that force that he need say nothing as to the readiness with which they would respond to the call of duty.

Mr. Schacht proposed the next toast, viz., "Science." He said he did not know why he should have been called upon, except for his connection with the scientific side of pharmacy, as President of the Pharmaceutical Conference. In a few eloquent sentences he spoke of the claims of science on pharmacists, and concluded by coupling with the toast the names of Professor Williamson, Dr. Gladstone, and Dr. Frankland.

Professor Williamson, in responding, said it seldom happened that any one word was always used strictly in one and the same sense, and at any rate such uniform use did not occur in the use of the word science. It must have often struck those present that different people used this word in exceedingly different senses. As far as he knew, the popular sense attached to it was that it denoted the knowledge of some very out-of-the-way and abstruse things, of interest only to old gentlemen who pursued them, and of no possible value in themselves; and matters which were studied by the persons who acquired a habit, not merely of simplicity of mind, but of unworldliness to a degree that they hardly knew how to take care of themselves; that in fact a scientific man almost wanted a nurse to take care of him. On the other hand, very recently a distinguished orator and statesman was reported in an after-dinner speech at the Society of Civil Engineers to have credited that body with all the most important discoveries of the age. That definition of science was about as remote from the popular one as anything could be. The masterly achievements of the Civil Engineers no doubt were attained by the aid of the scientific knowledge they possessed, but it certainly was satisfactory to find that these masterly results were the fruits of science. Amongst other views held of science there seemed to prevail an opinion that science was something which tended above all things to harden the nature and to make men very unsociable. On the other hand, in that distinguished company there would doubtless be some gentlemen who would be inclined to attach to the word "science" a meaning which would suggest something about exact knowledge, and not only so, but exact knowledge which was classified so that the different items of which that knowledge consisted were arranged in an orderly manner. However, if men differed as to the use of this word there was one thing about science which all people agreed in, and that was the remarkable development which it had taken of late years; not merely that science and scientific results came to be more associated, but that a number of active measures were being taken on a greater and greater scale for the promotion of science as compared with what was formerly the case. Amongst these various indications one of the most striking instances was the circumstance that men who pursued science were year by year more inclined to associate themselves in bodies for the promotion of the particular branches or applications of science with which they were specially concerned. Amongst the bodies thus formed he could not but bear testimony to the great usefulness, especially to scientific chemists, of the Pharmaceutical Society. It was not only useful in collecting and disseminating knowledge, but as a teaching body. The lectures of the distinguished Professors of the Pharmaceutical Society had done a great deal of good, not only in advancing the interests of the members of the Society, but in promoting the interests of pure chemistry, for amongst the various schools of chemistry, that of the Pharmaceutical Society held an exceedingly important place.

Dr. Gladstone said, as representative of the Chemical Society he begged to thank the meeting most heartily for the honour they had done to science. In coming amongst them he felt that scientific chemists might be taken as coming amongst those who were their elder sisters, for pharmacy existed long before scientific chemistry was born. He did not know how far back in the history of the world it was when men began to swallow all kinds of things and found that some things had very curious results on their system, and that some vegetable, animal, or mineral substances were of great benefit to their health. Of course it was very much by rule of thumb that this early pharmacy was pursued, yet one of the most curious results of modern research was that on turning up the old Egyptian books in which the receipts were written which were employed 3000 or 4000 years ago on the banks of the Nile, it was found that they were not very different to those employed in the present day. They might even go to China, and find that men in their longing after immortality thought they might discover some mineral which would confer this gift, and thus they were long led to search for that which they called cinnabar, and this was continued for many centuries. No doubt it caused them to die first, but that did not abate their zeal, until two of their emperors having themselves died, notwithstanding their use of it, it seemed to grow into disrepute, and became unfashionable. However, the science then passed from China westward towards Arabia, and thence into Europe, and so became the parent of modern chemistry. Without going any further into the history of the matter, they were all aware that this early pharmacy was the origin of chemical science, using the word science with the meaning given to it by Professor Williamson. But in speaking of this science he felt that there was an honour due to all practical applications of science, and that they should bear in mind how one department bore on the other. As he had spoken of the way in which chemistry was indebted to earlier pharmacy, so they might see how the attention paid to the medical necessities of man had brought an immense number of substances before the scientific chemist, and enabled him to elaborate his science. At the same time the chemist had been able to throw much light on those substances which were used in pharmacy, to show in what their value consisted, to separate that which was adventitious, and to produce pure substances for use in medicine. Moreover, the purely scientific study of chemistry had produced a large number of drugs and compounds which were of incalculable service in the relief of suffering humanity. He need hardly in that room refer to the various anæsthetics, such as chloral, chloroform, and others; and he had no doubt they would find many more, because it was the duty of organic chemists to build up these compounds. As they had been able to make turkey red for dyers, and vanilla for confectioners, so he hoped they would one day be able to build up quinine and other matters of the same kind. That might yet be a long way off, but he wished to call special attention to the desirability of the two things going hand in hand together, the pure, dry light of science, and its practical application in pharmacy. Pharmacy was now pursued on scientific principles, and he trusted that hand in hand pure science and pharmacy might long work together.

Mr. Sandford next proposed "The Medical Profession," which he said was above all others entitled to honour. The members of that profession were always ready to alleviate the sufferings of their fellow men, and anxious to devise and perfect new remedies, to minimize disease, and to do their best for the public good. They were told that they should honour the physician with the honour due to him for the uses they could have of him; that the skill of the physician shall lift up his head, and n the sight of great men he shall be in admiration. If the whole public ought to honour the physician, how much more should they as pharmacists do so, who saw so much of their work? He knew of no men who did more to promote the establishment of the Pharmaceutical Society than the medical profession, and therefore all honour was due to that profession from their members. He was delighted to see that they had so many distinguished members of that profession amongst them, and he begged leave to couple with the toast the names of Mr. Birkett, the President of the Royal College of Surgeons, and Dr. Seaton, who held one of the highest medical appointments in the gift of the state.

J. Birkett, Esq., in responding, said he felt it a great compliment to be invited to partake of that banquet. As a surgeon, he was not so intimately associated with pharmacists as physicians were. Surgeons were rather concerned in the operative departments, although no doubt they were highly indebted to pharmacists for the discovery of those beneficent agents by means of which they were able to perform the most delicate operations without causing suffering to their patients. He recollected the introduction of ether and chloroform, and therefore he felt they were very much indebted to chemists for the ease with which they were now able to perform difficult and painful operations. Surgeons, however, now gave as little physic as possible. In old times a surgeon never operated without a physician at hand, but these days were gone by, and they acted on their own independent judgment, and put medicine on one side as far as possible. He would only say, in conclusion, that he did place great confidence in medicine to a certain extent.

Dr. Seaton said it must be acknowledged that much which was said by Mr. Sandford was really deserved. There was no doubt that medical men were always ready to do their duty; but all men, all Englishmen at all events, were ready to do that, even though their duty was often an unpleasant and painful one, which taxed to the utmost their energies, both of body and mind. He did not know that they were particularly well remunerated for what they did, and he recollected very well the late Sir Benjamin Brodie, whom he was always proud to call his friend, saying to an assembly of young medical men, "You have chosen a very bad trade, but you have chosen a noble profession." When they saw what medical men would sometimes do—when they would go abroad, and run all risks of war and pestilence, which was far worse—to do good, they might fairly acknowledge that they were deserving of some credit. Money could not reward such duties; but it was not the money they looked to, but to the sense of having done that which was right and useful, and to the gratitude of those for whom they had done it. The kind feeling evinced towards them in that assembly he might say was thoroughly reciprocated. Education had done immense things for pharmacists, on whom medical men were largely dependent; it had elevated their status, and done a great deal towards producing proper relations between the two professions.

Professor Erasmus Wilson then said: Mr. President and gentlemen, I rise to propose a toast which, I am inclined to believe, must be considered as the toast of the evening, it is, "Success to the Pharmaceutical Society of Great Britain." If I had had the opportunity of choice I should not have been so presumptuous as to have selected this toast; but, seeing that it has been committed to my charge, I must confess that I know of none other to which I could address myself with greater satisfaction. In the year 1841, now approaching nearly half a century ago, a period of anxious thought and trial, in respect of the formation of this Society, was succeeded by one of unity and fraternity. The scattered pharmaceutical sticks were gathered into the traditional bundle and were so firmly bound together that, for the future, so long as the sticks elect to live in social harmony, no power in the universe will be capable of dispersing them. Thus, out of darkness there issued light, and out of separation and distrust unanimity and strength. In that same memorable year, 1841, a small but heroic phalanx of the leaders in pharmacy, few in number, composed this Society, then in its infancy. And the need of such a society and its present vigorous growth are manifested by its existing constitution. Glancing cursorily through the pages of the 'Calendar' of the Society for the present year, I find the present number of its constituents, including members, associates, and apprentices, amounts to about 6000; that besides its regular meetings for the intercommunion of knowledge it possesses a house which may be considered as its college; a museum of unequalled excellence and richness; a library and reading-room; a school, with its scholarships and prizes, and of the latter no less than three hundred have been carried off by its meritorious students; a Journal, the value of which I need not mention; and, moreover, not forgetting the exigencies and vicissitudes of human life, a benevolent fund, which has distributed more than £1300 during the past year. Truly these are signs of healthy vitality in a sound and vigorous constitution. There is another institution in connection with the Pharmaceutical Society which I for one am inclined to consider as of the utmost importance. I allude to this annual assembly of its members for the purposes of recreation and friendly intercourse, not overlooking the pleasant gathering which we hope to enjoy to-morrow evening. Ancient peoples attached a peculiar significance to the custom of partaking of salt with the stranger, and I myself firmly believe that we all entertain a stronger feeling of kindliness and regard for our fellow man after we have had the opportunity of enjoying a repast in his company. In such an act we seem to realize the "one touch of nature" of the poet, a sympathy to which we are all more or less susceptible. And then, again, there is the happiness, to say nothing of the privilege, of being brought into direct relation with the original founders of the Society and of those past presidents, of whom the greater number still remain amongst us, of those men who continue to be the lights and the leaders of the Society. Let me recite from amongst those honoured names that of Allen, your first president and a fellow of the Royal Society; of Payne, of Savory and Morson, of Squire, Ince, and Herring, of Gifford, Dean, and Davenport, of Sandford and Evans, and of Haselden and Hills. One name I have reserved from a motive of affectionate regret; it is that of a dear friend, whose memory holds a first place in the hearts of many of us, and who was among the most active of the founders of the Society, I need hardly say that I allude to Jacob Bell. Mr. President, I may say, with the utmost truth, that the Pharmaceutical Society has gained the fullest confidence of the medical profession. It has not alone succeeded in binding its own members together in friendly chains, but it has likewise thrown its silken fetters around us. Our prescriptions we know to be perfectly secure in your keeping, we are convinced that the best materials and the best combinations will be employed for the carrying out of our intentions; we commit to you with confidence our own dearest trust, the health of our patients, and with it the honour of ourselves. We seek you not unfrequently for information, which we are certain to have cheerfully supplied, and we know that whenever you make any discoveries which you believe will be of service to the public you are always ready to communicate them to us. I have said, and said from my heart, enough to prove that the Pharmaceutical Society of Great Britain is worthy of our deepest respect and esteem, and I feel assured that the Society will gain in lustre from the judicious and wise control of you, sir, its president.

The PRESIDENT having responded in a few appropriate words to the toast, and thanked the meeting for the cordial manner in which it had been received,

The VICE-PRESIDENT proposed "The Honorary Members of the Pharmaceutical Society," amongst whom he said there were many gentlemen who had distinguished themselves in various walks of science. In fact there were so many who held this position that he would not attempt to mention their names, but would simply couple with the toast the name of a distinguished gentlemen who was amongst them that evening, Professor Odling.

Professor ODLING, in responding, said some present might have heard a great deal said lately about the depressed state of pharmacy, and judging by the observations made by the President of the College of Surgeons, the prospect did not appear to be very brilliant for the future, but still it might be some gratification to know that the distinguished persons with whom he had the honour to be associated did nevertheless esteem it a high honour to be associated with this decaying Society. It was a remarkable illustration of the natural perversity of things that just at the time when pharmacists were being highly educated in the sciences with which they were connected,—botany, chemistry, and pharmacy,—to serve the public better than ever, it should be suggested that medical men might almost dispense with pharmacists and recommend their patients to take no more medicine than they could possibly help, and to take that in the most concentrated of forms. If there was a teacher to whom more attention was paid now-a-days than to medical men, it was the political economist, and whilst the surgeon told people to take as little medicine as possible, the political economist told them to buy it in the cheapest market. At the same time they knew that that which was cheapest was generally associated with qualities of a somewhat unsavoury character, and notwithstanding all these gloomy forebodings, he had no doubt that the Pharmaceutical Society would go on, and flourish as it had done hitherto; that it would still have honours to bestow, and not merely barren honours, and that the association of pharmacy and pure chemistry would bring, as it had done, reciprocal advantage and pleasure.

Mr. ATKINS proposed the last toast, namely, "The Visitors," their distinguished guests, without whom their *cuisine* might be worthy of Epicurus, but though they certainly might meet, they could not be said to dine. Many of their visitors were distinguished not merely for personal gifts and personal achievements, but as representative men. They had medicine, surgery, botany, and literature represented, and might be truly said to be getting into good society. It was said of the late Emperor of the French that he went into the Crimean war in order to get respectable alliances; but if they were seeking influential alliances they were doing it from no unworthy motives, but because they believed that between the practice of pharmacy and those noble professions there were points of contact, sympathy, and mutual co-operation. At times there seemed to be some trenching on their part on the noble profession of medicine, but the faculty must remember that after all they were a poor hardy race of mountaineers who had been defending their ancient dearly bought liberties. If at times a free lance from the hills had gone down into the fat meads below, that must not be regarded as the policy of the whole body of pharmacists. He begged leave to couple with the toast the name of Dr. Leared.

Dr. LEARED thanked the meeting for the cordial manner in which the toast had been received, and remarked that though pharmacists had in modern times departed from many of the rites and ceremonies with which they conducted their operations in ancient times, they had certainly not forgotten to exercise the rites of hospitality.

The Pharmaceutical Journal.

SATURDAY, MAY 18, 1878.

THE ANNIVERSARY MEETINGS.

THE full report that is given in the present number of the proceedings at the various meetings that have taken place during the past week, in connection with the Pharmaceutical Society, together with the full account of the arguments and evidence in an important action against a so-called Supply Association for breach of the Pharmacy Act, precludes, notwithstanding the supplementary pages, more than the briefest reference to the incidents of the week in these columns.

First in order comes the annual dinner of the members of the Society and their friends. This was in respect of the members and influence of the guests, and the character of the post-prandial proceedings, a decided success. So much, however, can hardly be said of the arrangements of the caterers, though the resources of the establishment were apparently strained to the utmost in the attempt to provide for the wants of the numerous company.

At the Annual Meeting the report of the Council gave rise to a running fire of friendly criticism, which it is only reasonable to expect upon the only occasion during the year when the members have an opportunity of direct expression of their opinions. And although some of the speakers seemed to be afraid that the members of the Council were oblivious as to the bearing which breaches of the Pharmacy Act by hucksters and co-operative stores, and the sale of patent medicines, might have upon the practice of their business, there was a general recognition that the Council is on the whole acting wisely in the interests of the trade. As the President pertinently remarked, the Council can only enforce the law, and that it is not always to be decided off hand, or *ex parte*, what this is will be evident to those who read the report on p. 926 of the case now awaiting the judgment of the Judge of the Bloomsbury County Court. The question of the admission of women into the Society, referred to the Annual Meeting by the last Council, was introduced affirmatively in an eloquent speech by Mr. WADE. The result proves that the equal balance of opinion among the members of the Council was a fair reflex of the opinion of the members of the Society. This renders of less importance a misunderstanding which is said to have led the Chairman to give an erroneous decision in declaring the amendment of the "previous question" carried. Some explanations at the adjourned meeting induced the President to correct this decision, and an arrangement was made that leaves matters *in statu quo*. We may mention that we had received a letter from Mr. WADE pointing out this mistake, but its publication is now no longer necessary.

The meetings came to an end on Wednesday evening with the Conversazione, at which about 2,400 persons were present.

The second annual meeting of the Chemists and Druggists' Trade Association was also held on Tuesday last, but we are compelled to defer a report of the proceedings until next week.

Transactions of the Pharmaceutical Society.

MEETINGS OF THE COUNCIL.

Wednesday, May 1, 1878.

HONORARY AND CORRESPONDING MEMBERS.

The following gentlemen were unanimously elected Honorary and Corresponding Members of the Society:—

Greenhow, Edward Headlam, M.D., F.R.S.

Hooker, Sir Joseph Dalton, M.D., K.C.S.I., C.B., Pres. R.S., etc.

Petit, Arthur, Lic. ès Sc. Phys., Mem. de la Soc. de Pharmacie de Paris.

Squibb, Edward R., M.D., of Brooklyn, U.S.

Vogl, Dr. A., Professor of Pharmacology, etc., University of Vienna.

Wednesday, May 15, 1878.

MR. JOHN WILLIAMS, PRESIDENT.

MR. WILLIAM DAWSON SAVAGE, VICE-PRESIDENT.

Present—Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Gostling, Greenish, Hampson, Hanbury, Hills, Owen, Mackay, Rimmington, Robbins, Sandford, Schacht and Shaw.

Several individuals were restored to their former status in the Society upon payment of the current year's subscription and a fine.

A letter from Dr. Greenhow was read, thanking the Society for his election as an honorary member of the Society.

The Weights and Measures Bill.

The President stated that since the last meeting of the Council, further progress being made with the Weights and Measures Bill, he had found it necessary to seek an interview with Mr. Farrer, the Permanent Secretary of the Board of Trade. He was accompanied by Mr. Sandford and Professor Redwood, and having communicated with the Medical Council, Dr. Acland came up specially from Oxford to attend. They had a long interview with the officials of the Board of Trade. The Honourable Edward Stanhope, who had charge of the bill, being present. The bill now stood for Friday next, and he believed he might say that the Government had so far acceded to the views put before them as to modify some of the clauses, and put in an exemption clause, which would allow the use of apothecaries' weights, and also of glass measures not of a capacity mentioned in the schedule to the bill. That was one of the great difficulties that the common ounce measure, graduated to drachms, would be illegal. He found that all their lives they had been using weights and measures for which there was no authority in any Act of Parliament. There was, however, an exemption clause in the old Weights and Measures Bill; with a similar clause in the present bill he thought they might be satisfied. He had pointed out to the representatives of the Government that pharmacists were bound under penalties to follow the directions of the Pharmacopœia, which authorized the use of apothecaries' weights.

The Paris Exhibition.

Mr. Greenish said it was much to be regretted that no report of the portion of the Vienna Exhibition, 1873, bearing on pharmacy, had ever appeared in the pages of the *Pharmaceutical Journal*, and the same observation would apply with regard to the Philadelphia Exhibition, of 1876. He believed it was the wish of the Council that the Journal should be kept abreast of the age in all that was of interest and benefit to pharmacists, and that could only be done by availing themselves of such opportunities as the one now presented by the Paris Exhibition. He thought the Editor should be afforded an opportunity of making arrangements for securing a report on the contents of that building, which would appear in the pages of the *Pharmaceutical Journal* as a permanent record of that portion which had a scientific interest and practical value to pharmacists.

On the motion of Mr. Greenish, seconded by Mr. Sandford, a vote was passed to defray the expenses requisite to obtain a thorough report on the Paris Exhibition as bearing in any way on pharmacy.

The Annual Meeting.

The Council then proceeded to arrange the course of business for the annual meeting.

Mr. Betty suggested that members of Council should not take an active part in the discussion of the resolution of which notice had been given for the admission of ladies membership, but leave it rather to the members generally.

Mr. Sandford thought the members of Council should not sink their own individuality, but that each one should express his own opinion.

The President agreed with Mr. Sandford that members of Council who had thought over this matter a good deal should state what conclusion they had arrived at.

Mr. Greenish regretted that this subject had been brought before a general meeting which could never be considered to fully represent the whole feeling of the trade.

Mr. Atkins and Mr. Schacht were inclined to agree with Mr. Betty that the discussion should be left chiefly to the members, but at the same time they did not think they should pledge themselves to any hard and fast line not to speak.

Mr. Bottle advocated the same view.

The Council then adjourned to the Annual General Meeting.

ANNUAL GENERAL MEETING.

The President took the chair at 12 o'clock, and the Secretary having read the notice convening the meeting, the President read the following address.

The President's Address.

I have again to say a few words of welcome to the members of the Pharmaceutical Society assembled in Annual General Meeting. Much has occurred since last we came together to excite feelings of deep interest. The annual Report of the Council, however, sufficiently enters upon such questions, and it is not necessary that I should now enlarge on them. With your permission I will confine my remarks mainly to what I may term my presidential experiences of the past two years. My term of office has expired and I can do so without prejudice to my successor.

Any one occupying the honourable position of your President is soon made conscious that it commands a certain amount of respect from other highly influential bodies. The courteous and distinguished manner in which your President is received by many public bodies, not only medical and scientific, but governmental, is not only gratifying, but has great significance. Various Government departments on many occasions during the period of my presidentship have sought the advice and the opinion of your Council, and when our interests were supposed to be threatened by the formation of a new institution which proposed to examine candidates and grant to them a title already appropriated to us under the Pharmacy Acts, the Government took especial care to inform us of the fact, that nothing should be done which could be injurious to our interests. These and many other incidents which have come under my notice, often little in themselves it is true, but making a large whole when taken altogether, have led me to the conviction that the Society as now carried on possesses the confidence and sympathy of other bodies both governmental and scientific to a degree which must be gratifying and advantageous to all members of our body, and to the trade at large. I cannot but think that this state of things is due to the wisdom of the past. We are indeed now reaping some of the benefits of the labours of those who wisely founded the Society upon broad and sound lines, the line of the public good, mainly at first by the elevation of the chemist and druggist educationally and professionally, and ulteriorly by securing increased safety to the public and the confidence of the medical profession. This has been a slow process. Years have elapsed since the foundation of the Society, but had our founders attempted to go too fast depend upon it the results would have been very different and much less satisfactory. Some of our members, I am aware, would urge us to pursue what they term a more active policy with reference to strictly trade interests, and think the Society would do well to strive to advance such ends by more rapid means. I must say I cannot altogether agree with this view. By the indirect but very certain process which we have hitherto adopted, always bearing in mind that as a public body we exist for the public good, the Society is making progress towards securing that position which should be the constant and consistent aim of every member of the trade to attain. I am looking forward to the time when the educated pharmaceutical chemist will be the one and only dispenser of medicine in the kingdom, when he will take his position in the ranks as an auxiliary of the medical profession and occupy the position the pharmacist on the continent does at this moment. When in due time we have convinced the medical profession that such a state of things would be for the public benefit, and have educated the public to look to the skilled pharmacist as the necessary coadjutor to the skilled physician, depend upon it we shall have no difficulty in obtaining recognition of our rights. It may be asked, Is this change likely to occur in our time? In answer to that I should say much depends upon ourselves. The cultivation of the sale of patent medicines will not help us much; but consistent and intelligent conduct of our business will. I think I see that things, at any rate in London and other large towns, are already tending in the desired direction. Although I cannot anticipate the immediate realization of my wishes, still by keeping our object steadily in view success may be vastly accelerated.

I remember well that when the Society was first founded, and after it had succeeded in its defence of trade interests at that time threatened by an obnoxious medical bill, the scientific meetings held every month were looked upon as a most important element in the effort then being made to raise the position of the chemist and druggist. Let me say that in my opinion the importance of supporting those evening meetings is now as urgent as ever. I wish I could make our country members feel more strongly that these meetings are their meetings quite as much as they are those of the London portion of our members. It is from our country members we want support in the shape of papers showing the results of work, I am sure I may add good pharmaceutical work, which has been done in many a pharmacy in the provinces. I am aware that much of this work now goes to the local associations and to the British Pharmaceutical Conference. To all such bodies I cordially wish success, but still our country members ought to remember that Bloomsbury Square has great and permanent claims upon them, and I do hope future Presidents will not have to fear taking the chair at our evening meetings with little or no matter to bring before the members.

Our magnificent museum and library must be a source of pride and gratification to all our members. They realize all that the founders of our institution could have anticipated; as President I have taken great interest in watching the progress made. Much good I am sure must result from the large and increasing circulation of books. I have observed that but few applications come from Scotland. Of course I am aware there is an excellent library in Edinburgh; but I would remind our friends north of the Tweed that the library in London is as equally available for distribution in the north as in the south, and the more use made of it the better for all.

I have been thrown much in contact with Journal matters during my term of office. I think that candid critics must admit that the influence exerted through its means is of a high and educating character, whilst it is so conducted as to receive the approval of its readers. It certainly has been, as far as I can judge, most impartial when any matter involving division of opinion has been under discussion.

Of our school much might be said. It has done good sound work in the past, and I trust will long maintain its high position, and continue in its career of usefulness. Now that other schools have arisen to more or less perfectly meet the educational wants of the trade, it behoves our school to buckle on its armour, in friendly rivalry, determined not to be outdone, but to make the education given to the students as pre-eminent in quality and quantity as endowment and the many advantages possessed by it may be supposed to ensure.

It is the privilege of your President to act *ex officio* as chairman of the Board of Examiners; this gives him an opportunity of seeing much of the working of the system of examination both in London and Edinburgh.

The result of my observations is most favourable, and I am quite convinced that this, perhaps the most important function of the Society, is conducted in a manner most fair and honourable. I am quite sure substantial justice is done to the candidates, and anything like intentional want of courtesy or kindness towards them is quite out of the question, although it is perhaps natural that a candidate who has failed may, in the irritation of the moment, have a different impression. I wish to take this opportunity of saying how much I have appreciated the manner in which the examiners perform their very onerous and responsible duties. I think also the two Boards may be congratulated on having such gentlemen as Dr. Greenhow and Dr. Maclagan occupying the position of Government visitors; their courtesy and attention is most marked and gratifying.

The prosecution of offenders under the Pharmacy Act is a function of the Society not of the most agreeable kind, however necessary it may be for the protection of the public interests. Your President frequently finds himself personally appealed to upon such cases when immediate decision is required. The Society, however, commands the services of gentlemen who are officially able to advise so wisely that I believe the best interests of the Society and the trade at large are well cared for.

Another duty devolving upon your President, is to watch the action of Parliament, and assist in taking steps to effect the alteration or rejection of measures which might prove injurious to the interests of our body. Even within a day or two of this time I have had to seek an interview with the authorities of the Board of Trade, respecting the Weights and Measures Bill now before Parliament, and believe I can announce that some objectionable clauses will be altered, and other exempting ones added, to render the bill harmless as far as it affects the interests of our trade. In this matter I received the very valuable assistance of Mr. Sandford and Professor Redwood. I am also much gratified in adding that Dr. Acland, the President of the Medical Council, came up from Oxford to represent the views of that council in support of our own.

Of that more advanced stage of usefulness, the actively taking part in the passage of legislation which would be beneficial to us I have had no experience during my term of office; my more distinguished predecessors had done in the past so much, and so well, as to leave but little opportunity for those who follow. Still there are matters upon which by universal consent it would be most important to get fresh legislation when we see our way to a prospect of doing so successfully. I trust my successor in the office of President may be more fortunate than myself, and have the happiness to announce that he has been instrumental in advancing our objects.

One word before I conclude in allusion to the Council and officers of the Society, and to thank them earnestly for the assistance they have afforded me and the kind forbearance to my shortcomings. It has not been a difficult task to preside in a Council where party spirit is unknown, but every man expresses his own individual opinion upon the subject immediately before the meeting. I trust such a state of things may long continue, and that our councillors will never be degraded into mere delegates, but will continue to be the fair representatives of the intelligence of the whole trade. I fail to see that there are local interests to serve requiring special representation. Our interests properly understood are one and undivided, and although it is most important that members of the Council should be taken from various localities—as being able to give valuable experiences and assistance—still, upon every question which comes before the Council it is the duty of each member, from whatever part of the country he may happen to come, to consider every matter as of equal importance.

And now, gentlemen, I conclude, trusting the discussion of such matters as may come before you for consideration to-day may be carried on in that spirit and manner which will best conduce to the advancement of pharmacy and the interests of the Pharmaceutical Society.

The PRESIDENT asked whether the Report of the Council should be taken as read.

Mr. ANDREWS said he should not object to that course on the present occasion, but he hoped it would not be made a rule to do so always.

The following Report and Balance Sheet were then taken as read :—

REPORT OF THE COUNCIL.

The financial statement of the year 1877 presented herewith shows an increase in the receipts of the Society and an augmentation of its numerical strength on the one side, while on the other the general expenditure is shown to have been sufficiently within the income to enable the Council to purchase £2000 New 3 per cent. stock, as an addition to the previously invested capital.

The number of candidates for examination in the various grades is perhaps the most important point brought forward periodically for consideration, and an advance therein occurred in 1877. The numbers were as follows: Preliminary, 1,083; Minor, 536; Major, 98.

Comment has been made by various writers in the *Pharmaceutical Journal* on the large percentage of failures reported from time to time by the Board of Examiners, and the subject has frequently been under discussion in the Council. However much these failures may be a cause for regret, there is ample evidence to show that they result not from too great stringency in the examinations but from a want of competence in the candidates. The amount of knowledge required in those to whom the important duties of pharmacy are entrusted by the Legislature must be the standard insisted on, rather than, as some writers seem to suppose, the capabilities of the young men presenting themselves for examination. In other words, the standard must be fixed according to the requirements of the public, not according to the acquirements of the candidates.

In this matter, some question has arisen on the difference in the number of rejections in London and Edinburgh. It is manifest that for the well-working of the Pharmacy Act, uniformity, as nearly as it can be attained, should exist in the conduct of the examinations at the two centres. To ensure that, as well as to maintain the cordial feeling which has always pervaded the members of the Pharmaceutical Society, in England and Scotland, occasional visits have been exchanged between them with the best possible result. In February last two members of the Council, accompanied by three of the London Examiners, were deputed to visit Edinburgh at the time of the examinations, and specially to ascertain if any important difference existed between the two Boards. It was gratifying to observe that the arrangements for conducting the examinations were in most essentials as satisfactory, and the regulations as strictly carried out, as those at Bloomsbury Square, the same high sense of duty animating the conduct of the Examiners of both Boards.

During the year 1877 many valuable books have been purchased for the Library, as may be inferred by the increased outlay under that heading in the financial statement. Judging from the large number of readers now constantly found in the Library, there is perhaps no department of the Society's establishment more important, and the Council has always endeavoured to render its advantages as accessible and its arrangements as convenient as possible. A few years since it was decided to pay carriage one way, outwards or inwards, on books applied for by members and associates in business in the country, and the appreciation of this resolution has been evinced by an increased circulation. In order to extend still further this benefit the Council recently decided that when associates or apprentices in the country applied for books, the carriage to or from them also should be paid by the Society, and that the time allowed them for retaining books should be the same as that allowed to members.

The Museum has been enriched by many important additions, and in perfecting the classification many duplicate specimens have been liberated, some of which have been appropriated to the North British Branch; others are being offered to Local Associations.

The catalogue compiled by Mr. Holmes, the Curator, has been completed, and, containing as it does much information beyond a mere list of the specimens enumerated, will be useful, not only to those who by its aid examine the contents of the Museum, but also to all who are interested in chemistry or materia medica.

The evening meetings at Bloomsbury Square have been well attended; many papers on interesting subjects have been read, and the discussions arising therefrom well sustained. Extra meetings were held in May, 1877, and February last, when Professor Redwood delivered lectures on "Spectrum Analysis," using for their illustration the electric light; also in April last Professor Bentley lectured on "*Eucalyptus globulus*."

The professors have reported from time to time that a fair average number of students were attending their classes, and, what is equally important, that the conduct of the students has been marked by great diligence and an evident desire to avail themselves of the opportunities offered for improvement.

No legislation has been proposed directly restricting the trade of chemists and druggists since the last Annual Meeting, with the exception of the Medical Act Amendment Bill, introduced last year by Dr. Lush and Sir Trevor Lawrence. Had the Bill passed in its original form, even that amount of prescribing which the most determined against "counter practice" are compelled from time to time to undertake would have become illegal, and much inconvenience would have resulted both to chemists and the public. It is due to Dr. Lush to state that immediately on it being represented to him by a deputation from the Council of the Pharmaceutical Society that this injurious effect would be produced, he undertook to remove the objectionable provisions in the Bill, stating at the same time that he had no desire to do anything adverse to the interests of chemists and druggists. The Bill, which failed to pass last session, has been again introduced in an unobjectionable form this year, but as the Duke of Richmond has brought forward a comprehensive measure to consolidate and amend the Medical Acts, private members of Parliament will probably leave the ground clear for the Government. The same fate probably awaits the Dental Practitioners' Bill, as dental practice is provided for in the Government Bill.

Dentistry, although no part of pharmacy, has always been more or less practised by chemists, especially in many small places, where dentists exclusively following that profession are not to be found. It was therefore felt by your Council that care should be taken that those chemists who have hitherto practised dentistry should not be precluded from registration and consequently debarred from the privileges pertaining thereto. On this point the Council immediately addressed Sir John Lubbock and the promoters of the Dental Practitioners' Bill, who complied with the request that certain words which rendered the matter doubtful should be erased.

Considerable excitement has been occasioned by unusual activity, apparently on the part of the Society of Apothecaries, but in reality, perhaps, of the "Medical Defence Association," in the prosecution of chemists for infringements of the "Apothecaries Act, 1815." This has been a very delicate question to deal with. The 21st section of the Act of 1815 reserved to chemists and druggists the right to carry on their business as fully and freely after as they did before the passing of that Act, and there are still many men living who can testify as to the custom of chemists prior to that date; still as no positive line can be drawn between ordinary medical practice and counter prescribing, it is most important that a good understanding between the two parties concerned should be established. It is very well known that the Pharmaceutical Society has never encouraged the practice of medicine by its members; it has rather fostered the idea of the separation of the duties of the prescriber and the dispenser, and the due qualification of each for his office. Nevertheless, it is obvious that, more or less, all chemists are called upon to advise as to the nature and uses of the medicines which they sell, and to supply them not only in their simple but also in compounded forms. To be restricted in doing this would be injurious, both to the chemist and the public. Under these circumstances the solicitor of this Society was instructed to put himself in communication with the solicitor of the Society of Apothecaries, and the result of their correspondence, which has already been published in the Journal, may be considered reassuring and satisfactory.

Upwards of 150 informations of infringements of the Pharmacy Act have been received by the Registrar during the past year. In nearly all cases it has been found unnecessary to take legal proceedings; in most of them the offences having been discontinued in compliance with the premonitory letters addressed to the offenders by the Registrar. The names of two persons who had improperly obtained registration as chemists and druggists have been erased from the Register by order of the Council.

It will be remembered that in the last report a case of fraudulent personation of a candidate for the Preliminary examination was mentioned. The offender, although convicted on that occasion, was not punished; but afterwards two other similar cases were discovered against him, and at the second trial in August last he was sentenced to six months' imprisonment.

A Committee having been appointed to consider whether any, or if any what, amendments were required in the Pharmacy Act to promote a more efficient working thereof, presented a report to the Council containing various suggestions. This report has been duly received and accepted as a basis for action on the occurrence of a suitable opportunity.

Representations as to the danger arising from the indiscriminate sale of Chloral Hydrate having been sent from coroners in various parts of the country, some direct to the Council, others to the Home Secretary, after full consideration that substance has been added to the schedule of poisons, and must now be dealt with as an article included in Part 2 thereof; this has been intimated by order of the Council to every chemist and druggist on the Register.

The Board of Trade having under consideration a measure for consolidating the Acts relating to Weights and Measures in the United Kingdom addressed a letter to the Council, accompanied by a copy of the proposed Bill, asking information as to the practicability of withdrawing the right to sell drugs by apothecaries' weight, a right which had been reserved in the Act of 1835. The Committee by which the question was considered replied that many articles of a potent and expensive character were constantly purchased and sold by apothecaries and chemists in very small quantities, and that much inconvenience would arise by prohibiting their sale by the drachm or scruple, those being the denominations of quantity still current in prescribing. This objection being admitted as a fair one the Board of Trade determined not to interfere with the old practice. More recently, however, the Bill has been altered by a Select Committee of the House of Commons and apothecaries' weight entirely ignored. The Council are still taking active measures to remedy this evil.

During the past year some ladies have applied for admission into the Pharmaceutical Society. The question was discussed, but the Council bearing in mind that in 1873 the Society, in general meeting, had by a large majority adjourned the question of admitting ladies as Members, Associates, or Students of the Society, *sine die*, it was decided that it was the right of the whole Society rather than of its Council to alter that decision. The subject will probably be submitted at the Annual Meeting at which this report will be read, and it will be for the members to signify their wishes upon this question.

The increasing claims upon the Benevolent Fund have commanded and received careful investigation and liberal consideration at the hands of your Council, who feel the desirability of extending the benefits of this excellent institution by every possible means. On the evening preceding the last Annual Meeting a festival was held, which was largely attended, and which resulted in donations and subscriptions amounting to upwards of £1600.

This very gratifying result emboldened the Council to aid more liberally in the provision for, and education of, orphan children by securing their election to public asylums; also to augment the pensions of

FINANCIAL STATEMENT FROM JANUARY 1ST TO DECEMBER 31ST, 1877.

Receipts.

	£	s.	d.	£	s.	d.
Balance in Treasurer's hands, January 1st, 1877				1703	6	1
Balance in Secretary's hands, January 1st, 1877				57	6	3
Life Members' Fund—Fee	5	5	0			
Interest	88	17	6			
				94	2	6
Government Securities—Interest				444	7	6
Subscriptions :—						
1788 Members, Pharmaceutical Chemists	1877	8	0			
827 ,, Chemists and Druggists	868	7	0			
814 Associates in Business	854	14	0			
833 Associates not in Business	437	6	6			
1054 Apprentices or Students	553	7	0			
23 Entrance Fees	48	6	0			
	4639	8	6			
Fines upon restoration to the Society	53	12	9			
				4693	1	3
Examination Fees :—						
1182 Preliminary Examination Fees	2233	7	0			
27 Modified ,,	28	7	0			
520 Minor ,,	1535	2	0			
96 Major ,,	456	15	0			
				4253	11	0
Registration Fees :—						
34 Registration Fees as Chemists and Druggists	178	10	0			
22 Fees for Restoration to the Register	23	2	0			
				201	12	0
Balance due to Mr. Mackay, December 31st, 1877				48	10	0
				£11,495	16	7

Expenditure.

	£	s.	d.	£	s.	d.
Balance due to Mr. Mackay, January 1st, 1877				13	0	2
Apparatus				59	6	7
Annuity—Dr. Redwood				100	0	0
Carriage of Books to or from the Library, and other parcels				8	12	11
Certificates of Death				22	0	11
Conversazione	130	9	6			
Pharmaceutical Meetings	27	3	7			
				157	13	

Examiners, Boards of—

	England and Wales. £	s.	d.	Scotland. £	s.	d.
Fees to Examiners	686	4	0	153	6	0
Fees to Superintendents — Prelim. Examination	223	13	0	23	2	0
Hire of rooms for conducting Prelim. Examination	62	7	6	5	3	0
Travelling Expenses	107	15	3	6	1	0
Refreshments for Examiners	65	1	2	4	6	4
Apparatus, Drugs, Chemicals, for Examinations & sundry charges in connection therewith	62	9	3	9	18	0
				201	16	4
				1207	10	2

	£	s.	d.	£	s.	d.
	1409	6	6			
Fees to the College of Preceptors	113	8	0			
				1522	14	6
Fixtures and Fittings				95	8	8
Furniture				24	18	3
House Expenses				213	17	1
Purchase of £2000 New 3 per cent. Stock				1895	0	0
Journal				471	2	3
Laboratory :—						
Professor of Practical Chemistry—Endowment of Chair	100	0	0			
Prize Medals, etc.	5	11	0			
				105	11	0
Law Charges				246	7	2
Lectures :—						
Professor of Chemistry and Pharmacy—Endowment of Chair	100	0	0			
Professor of Botany and Materia Medica—Endowment of Chair	100	0	0			
Subscription to Royal Botanic Gardens	21	0	0			
Prize Medals, etc.	12	4	2			
				233	4	2
Library :—						
Librarian's Salary	200	0	0			
Purchase of Books, etc.	136	8	9			
				336	8	9
Purchase of Books, etc.—Hanbury Fund				6	5	6
Local Secretaries' Expenses				2	11	10
Museum :—						
Curator's Salary	200	0	0			
Specimens, Bottles and Sundries	132	5	10			
				332	5	10
Branch of the Society in Scotland :—						
Assistant Secretary in Scotland—Salary	130	0	0			
Furnishing Account	12	6	8			
Current Expenses	116	6	10			
				258	13	6
Postage				280	17	9
Provincial Education—Grants to Provincial Associations				55	0	0
Register				33	19	11
Repairs and Alterations				229	13	5
Rent, Taxes, and Insurance				483	9	6
Returned Subscriptions to Associates				19	19	0
Stationery, Engraving, Printing, and Office Expenses				298	14	2
Salaries :—						
Secretary and Registrar	450	0	0			
Assistant Secretary	250	0	0			
Clerks and Servants	722	6	1			
				1422	6	1
Cost of Materials supplied to the Bell Scholars—session 1877-78				10	0	0
Council Prizes and Herbaria Medals				14	12	7
Defalcations of a deceased Clerk				122	0	0
Sundries				9	9	4
Travelling Expenses—Country Members of Council				232	12	4
Refreshments for Council				38	18	7
Balance, December 31st, 1877 :—						
In Treasurer's hands	1064	19	5			
London and Westminster Bank. On deposit	1000	0	0			
In Secretary's hands	74	2	4			
				2139	1	9
				£11,495	16	7

Dr. BENEVOLENT FUND, 1877. Cr.

Dr.

	£ s. d.	£ s. d.
One quarter's payment to Two Annuitants (now deceased)	15 0 0	
Twenty-one Annuitants, each receiving £30	630 0 0	
Two months' annuity to Christmas to Six Annuitants elected in October, 1877	30 0 0	
		675 0 0
A former Member, Brighton, age 60	10 0 0	
A former Member, Beaminster, age 74	20 0 0	
A former Member, Liverpool, age 59	5 0 0	
A former Member, Dublin, age 44	10 0 0	
A former Member, Bridgwater, age 67	20 0 0	
A former Associate, London, age 53	20 0 0	
A former Associate, Kirkgunzeon, age 27	10 0 0	
Widow of a Member, Durham, age 30. Grant to promote the election of one of the children to the British Orphan Asylum (child elected)	52 10 0	
Widow of a Member, Hammersmith, age 28	20 0 0	
Widow of a Member, Lyndhurst, age 67	10 0 0	
Widow of a Member, Guernsey, age 60	20 0 0	
Widow of a Member, Belfast, age 67	20 0 0	
Widow of a Member, Northampton, age 49	15 0 0	
Widow of a Member, London, age 53	10 0 0	
Widow of an Annuitant, age 58	10 0 0	
Widow of a Member, Parkgate, age 54	10 0 0	
Widow of a Member, Devizes, age 47	15 0 0	
Widow of a Member, London, age 74	20 0 0	
Widow of a Member, Kensington, age 41. Grant to assist in the election of one of the children to St. Ann's School (child elected)	26 5 0	
Widow of a Member, London, age 62	5 0 0	
Orphan Daughter of a Member, Southhampton	10 0 0	
A Registered Chemist and Druggist, Kirkcaldy, age 48	15 0 0	
A Registered Chemist and Druggist, Norwich, age 67	5 0 0	
A Registered Chemist and Druggist, Leith, age 51	10 0 0	
A Registered Chemist and Druggist, Wells, Norfolk, age 52	10 0 0	
A Registered Chemist and Druggist, Liverpool, age 41	10 0 0	
A Registered Chemist and Druggist, Bridgwater, age 56	10 0 0	
A Registered Chemist and Druggist, London, age 50	10 0 0	
A Registered Chemist and Druggist, London, age 66	15 0 0	
A Registered Chemist and Druggist, Tideswell, age 76	10 0 0	
Widow of the above, age 59	20 0 0	
Widow of a Registered Chemist and Druggist, Bishop Stortford, age 44. Grant to assist in the election of one of the children to St. Ann's School (case pending)	52 10 0	
Widow of a Registered Chemist and Druggist, Ashbourne, age 67	15 0 0	
Widow of a Registered Chemist and Druggist, Croydon, age 57	10 0 0	
Widow of a Registered Chemist rnd Druggist, Hull, age 37	15 0 0	
Widow of a Registered Chemist and Druggist, London, age 37	15 0 0	
Widow of a Registered Chemist and Druggist, Birmingham, age 53	10 0 0	
Widow of a Registered Chemist and Druggist, Norwood, age 44	15 0 0	
		586 5 0
Purchase of £2100 Consols		1995 15 0
Printing and Stationery	31 10 9	
Postage	26 11 6	
		58 2 3
Balance due to Secretary, January 1st, 1877		2 15 4
Balance in Treasurer's hands, December, 31st, 1877		108 2 7
Balance in Secretary's hands, December 31st, 1877		25 9 11
		£3451 10 1

Cr.

	£ s. d.	£ s. d.
Balance in Treasurer's hands, Jan. 1st 1877		154 6 7
Dividends on Invested Capital		472 10 0
Donations	96 14 6	
Subscriptions	1105 5 4	
		1201 19 10
Dinner—Donations and Subscriptions (less expenses)		1612 13 8
Legacy		10 0 0
		£3451 10 1

We, the undersigned Auditors, have examined the accounts of the Pharmaceutical Society, as presented in the Financial Statement and Benevolent Fund Account, and find them correct; and that there was standing to the account of the Society at the Bank of England, on the 31st December, 1877 :—

		£ s. d.	£ s. d.
General Fund	New 3 per Cents.	17,000 0 0	
Life Members' Fund	New 3 per Cents.	3,000 0 0	
			20,000 0 0
Benevolent Fund	Consols	17,800 0 0	
Pereira Memorial Fund	Consols	100 0 0	
Bell Memorial Fund	Consols	2,050 0 0	
			19,950 0 0
Secretary's Casual Relief Fund do.			105 0 0
Hills Prize Fund—Russian Bonds			300 0 0

FREDERICK ANDREWS
FREDERICK BARRON
WILLIAM HODGKINSON
} *Auditors.*

February 28th, 187

Annuitants who have attained the age of 65 years. Some changes have been made in the "Regulations" for administering this Fund. A new clause has been introduced, which carries to the credit of any subscriber or donor, or his widow, who may by adverse circumstances be compelled to become a candidate for an annuity, "such number of votes . . . . as shall be represented by the whole amount of subscriptions or donations," he may have contributed to the Fund.

It is still a matter for regret that though all "chemists and druggists" on the Register are eligible to receive aid in case of need, whether connected with the Society or not, the number contributing to the Fund bears a very small proportion to the number on the Register.

Mr. G. H. Wright moved—

"That the Report of the Council, as now read, be received, adopted, and printed in the Society's Journal and Transactions."

Dr. Symes (Liverpool) seconded the motion.

Mr. R. O. Fitch (Hackney) wished to ask what steps had been taken with respect to co-operative stores selling poisons, and not entering the sales as required by the Act. Last year he mentioned this matter, but withdrew his resolution on the understanding that the new Council would take cognizance of the matter. He held in his hand a report showing that a well-known man had been ordered by Mr. Justice Huddleston to be prosecuted for selling cyanide of potassium to a photographer, and he believed he was prosecuted and fined, yet to his knowledge there were several stores in London where no poison book whatever was kept, and poisons were sold openly. He had with him a co-operative store list in which "Easton's tonic syrup" was quoted, which contained one-thirty-second of a grain of strychnia in each drachm, and, when the Act stated that strychnia and all its preparations were not to be sold except to persons known to the chemist, or introduced to him, he thought it ought to be enforced. At the time of the Bravo poisoning case the question arose whether the poison was purchased at Balham, or elsewhere, but Mr. Bravo was a barrister, and like most barristers, was probably a member of the stores, but no question was asked whether it was purchased at them. He thought the Society should communicate with the police, and say that such things were so kept and sold. With regard to the opinions given by counsel that it was not politic to prosecute the stores, he did not think an honest opinion could be got from counsel on this point, because they were nearly all either ticket holders or shareholders of the stores; and they would not speak against their own shop. In the case which the Society recently prosecuted, the magistrate showed unmistakably that he was interested in the stores, and he thought the question ought have been put to him whether he was or not, because it used to be a maxim in England that no man should sit in judgment on a matter in which he was interested. There was a report in the Journal recently that two stores in the country had been prosecuted for selling spirit of nitre which contained 56 parts of nitre and 44 of water. It was generally supposed by the public that they got their things more genuine at these stores, and at a much cheaper rate; but at any rate these stores ought to be made to observe the Act in the same way as chemists were, and in fact, if the Society did not do this he was empowered to say that a body of outsiders would go to the Court of Queen's Bench for a mandamus to compel the Society to carry out the Act fairly and properly. If he were to take an assistant into partnership they would not allow him to paint his name up unless he were on the register, and they ought to be equally strict with the stores as with the trade. Some twelve months ago he had a gentleman come to him and ask him for some handbills with the prices showing what he was selling patent medicines at, and one member of the Council had written to him upon the subject. He recollected telling him that there was a tea dealing establishment in his neighbourhood sending out price lists showing $9\frac{1}{2}d.$ for many articles, and he was obliged to do it in his own defence. Yet he had seen a not very complimentary allusion to himself as being the cut-throat of the trade. That was not fair, because he came to the Council in a manly way and asked it to interfere. It did not choose to protect the trade, and therefore he had taken measures to protect himself, and if that worked hardly on some poorer members of the trade it was the want of action on the part of the Council which led to it. A remark had been made in the President's address with regard to the courtesy with which young men were treated coming up for examination, though those who did not pass would not think so, and he was quite certain they did not think so, and he did not think they were treated fairly in not being told in what part of the examination they failed. Nor were all the questions fairly put. One question in July, 1876, was—Give the feminine form of a certain animal. When he read it he thought it must be a mistake, and that they must have supposed the young men to be candidates for a zoological society or something of that sort. He had asked an M.A. of Oxford and of Cambridge to answer it and neither could do so off-hand, though one did after some time. The question was "Give the feminine form of a fox," and he contended it was not a fair way of putting the question. Some one he knew was told by a chemist in the country with great exultation that his son had passed the examination, but some time afterwards when in London he met one of the examiners who intimated pretty plainly that the young man in question was not quite up to the mark. At the time the young man's father had a seat on the Council; he did not say it had any influence, but it looked suspicious. He should move as an amendment—

"That it is the opinion of this meeting that it is expedient that the Council should at once take legal proceedings against the proprietors of one of the co-operative stores in order that the legality of their action should be finally settled."

The President said it was hardly an amendment, and it had better be put as a resolution subsequently, but he might remind Mr. Fitch that they could only carry out the law; they could not prevent people selling patent medicines.

Mr. Long thought all the members must be very well satisfied with the report, and certainly their thanks were due to the Council for the able manner in which it had carried on the business of the Society. The Society was now something like thirty-six years of age, and was pretty strong, but it did not represent the drug trade. There were a great many more chemists outside the Society than there were in it, and one of the questions usually asked was, what does the Society do for us? He would ask, what do we do for ourselves? It was all very fine to expect the Council to provide bread and butter for them, but as a society they must keep themselves. He did not think the Society did for them, or that they did for themselves, what they were entitled to. A few years ago they had a business and were able to pay their way and be comfortable. They obtained an Act of Parliament to protect themselves, and to prevent other people infringing their rights. At that time there was a great discussion on it, and what he suggested was that they should remove opposition whenever the Act was obtained and admit everybody who was in buisness, and then they would get a good Act. But that was not carried out. Sir Fitzroy Kelly took their case in hand, but Sir John Shelley took up the case of the outsiders, and therefore Parliament was very careful what sort of Act it passed. The result was they had a fine affair for putting their heads into a yoke, which saddled them with all sorts of disadvantages, and gave them nothing in return. Any one could be a chemist, so long as he did not put "chemist" up, which was perfectly unnecessary. All he had to do was to invest in a number of bottles, and stick out some carboys with coloured solution in them, and people thought that that meant a chemist. The only thing he could not do was to sell poisons. But who wanted to sell poisons? They were the very bane of their existence. Poisons were no advantage to them, and yet that was the only protection they had. He considered that their Act was entirely deficient, and that a large body like theirs ought to be able to go to Parliament and show the disadvantages under which they laboured, the immense amount of anxiety, responsibility, and capital they had to employ in preparing for, and conducting their business, and to insist on some return for their money and labour. As for the Council going to oppose co-operative stores in the present state of the law, it could not do it. Here was an Act of Parliament passed, under which if he were not a chemist he could not purchase a certain stock and stick a qualified man in to keep it, but he could evade the Act by getting a certain number of persons to join him, and calling it a co-operative store. There is no co-operation about that; it was wholesale shopkeeping, that was all. A co-operative store was something in which each person had an interest, and if fifty people chose to combine together and purchase a certain thing and divide it beween them, he did not think the law would ever touch them. If a druggist died, his widow could not carry on the business for her own advantage, and why should anybody else be allowed to do so? The Act was inoperative, and they ought to have a new one. The drug trade was in a very unsatisfactory state, and was killing men off very fast, as could be seen by the obituary. He did not mean that the Council could do anything in that way; they must themselves do away with some of the wear and tear and worry of it. They must do away with that idea that they were always ready to attend to anybody whatever time they came, have definite hours of business, and make people come within those hours or else pay an extra fee. Their philanthropy was as great as anybody else's, but why should a man, just as he was sitting down to read, be disturbed by Mrs. Jones who had forgotten a simple thing which she could have got in the middle of the day?

Mr. Urwick wished to make a few remarks on the balance sheet. He heartily congratulated the Council on the state of the funds, which enable it to still lay by money; but he thought the time was coming when the Council would have laid by a sufficient sum to give the Society a permanent standing, and should seek to do something else with it. The income was about £9735, and the expenses were £7462, giving a considerable balance to the good. There was £1000 in the Treasurer's hands in December, and £2000 had been invested that year, making £3000 to the good in the working of last year. He took it that the accumulated fund was now £15,000, and £2000 added would make £17,000, and this year they would be able to lay by £3000 more which would bring it up to £20,000. He had always looked forward to the Society having such a sum, but he thought it would then be time to make a different application of the fund which remained over and above the working expenses. His idea was that when that time came they should reduce the subscription to half-a-guinea, which would still leave them a surplus of £700 a year over the working expenses. Objection might be raised to this, and some might say that a guinea was none too much for a man to subscribe to a respectable society; but if they could get the same advantages for half-a-guinea he did not see why they should not do so, and it would increase the number of members throughout the country. One item he did not quite understand was the £483 for rent, which seemed somewhat larger than it used to be.

The President said the rent was £230, but there was another £100 for rent paid for Mr. Bremridge's house, and the rates and taxes made up the remainder.

Mr. Urwick thought those items ought to be separated.

Mr. Robbins said he should be very glad, as a member of the Council, if they could accept Mr. Urwick's figures as correct, but he thought that he had rather misled the meeting with regard to the amount of money saved during the year. £2000 had been invested as he stated, and he said there was another £1000 in the Treasurer's hands; but if he looked to the beginning of the year he would find there was a balance of £1700 brought forward, consequently, it showed a saving of about £2000 instead of £3000.

Mr. Urwick said he had taken all the figures carefully, and he believed he was right.

Mr. Richardson said the criticism indulged in on these occasions had, he believed, always been conducted in a friendly spirit towards the Council, but he would beg to suggest what appeared to him important in drawing up the report which would have met some of the objections. His proposal was that the report should be in three parts; the first containing the financial portion; the second, the Benevolent Fund; and the third, the general policy of the Council. They would not then have the irregularity of gentlemen moving amendments to the reception of that which they did not object to. He felt pretty strongly with reference to the sale of drugs by unregistered persons. Very often there were very great hardships on registered chemists and druggists in small towns and country districts. If these men could not be protected from little shopkeepers in every street, it was a great hardship on them that they should have to go through an expensive education and yet be on a par with all the hucksters in their neighbourhood. He regretted to find that the Society was still too lenient. One portion of the report stated that there had been upwards of one hundred and fifty informations of infringement of the Pharmacy Act received during the past year, but in nearly all these cases it had not been found necessary to take legal proceedings, the offences having been discontinued in consequence of the premonitory letter sent by the Registrar. Now these people always discontinued for a certain time. The premonitory letters had an effect for probably a year or so, and then the evil grew up again; but the registered chemist on the spot would not again interfere because these things became known, and he was often very much pestered in consequence. When a chemist had made one *bonâ fide* complaint and had brought forward the proof necessary, then the Council said, No; we must send this man a caution and shall not prosecute him unless he does it again. The chemist then got disgusted and declined to have any further interest in the matter. Very recently he met the Coroner for Leicester, who complained very much of these sales of poisons by unregistered persons. In his district there were many deaths of children arising from poisoning by means of Godfrey's cordial, which could be obtained at almost every little shop, and he thought the Society should take more stringent means to prevent the sales of these poisons by unregistered persons. In his own town there was no necessity for excessive competition, but there was a gentleman there who issued a voluminous monthly list enumerating almost every article in the Pharmacopœia, and all the patent medicines in daily use, and some of the prices he gave were quite startling. A combination was made by the retail chemists and respectful circulars issued to the wholesale houses in London, calling attention to the fact that this gentleman was doing this sort of thing. He got one of these circulars which they had been sending and sent a copy to every respectable inhabitant of the town, saying this was the pressure brought upon him because he endeavoured to let them have things at a reasonable rate. Therefore, before they attempted to take action against co-operative stores they should wash their own dirty linen at home. The President in his address had rather deprecated the sale of proprietary medicines, and that might be very well for Regent Street and Oxford Street, but the patent medicines were an important element in the drug trade in this country, and he did not see why they should be ashamed to sell them when they had houses such as Morson's and Davenport's who sold them. He would also call the attention of the Council to the prohibition lately introduced against the importation of English patent medicines into France. Some few years ago these medicines were admitted under a certain tariff, and they gradually got an extensive sale. But the Frenchmen finding the English were getting an advantage they went to the Minister of the Interior and obtained a veto on any of these patent medicines sent from England. This was a matter which he thought the Society might bring before the Government. Of course, the less scrupulous smuggled their articles into France, and in some of the English pharmacies you might see the windows filled with certain quack medicines. In conclusion, he begged to express his regret, which he was sure would be met by all the members, at the intimation given by the President that he was about to resign his present position.

Mr. ANDREWS, as one of the auditors, wished to mention that some years ago he suggested that the £100 a year allowed to Mr. Bremridge for rent should be placed under the heading of salary, and he would throw out the suggestion for the Financial Committee to consider.

Mr. SLIPPER wished to repeat some remarks he had made on a former occasion with regard to the Preliminary examination. As he had mentioned some years ago, in the examination there were introduced subjects which were not taught to boys in any school in this country so far as he knew. He referred to the metric system. This was not required in the Oxford or Cambridge examinations or at the College of Preceptors, and yet certificates of those bodies were received. He did not say it was not necessary for druggists to understand the metric system, but it was not a thing which ought to be introduced into the preliminary examination. Boys could only prepare for it by a little cramming beforehand, and that ought to be discouraged. He could only suppose that there was some gentleman connected with the Educational Committee who had a crotchet about this, and he hoped it would be attended to, or if not, he would on some future occasion move a resolution. Could any gentleman on the Council tell him of any public school where boys were instructed in the metric system?

Mr. CRACKNELL replied, at University College School, in Gower Street.

The PRESIDENT said, the metric system was included in the Pharmacopœia, and therefore they were bound to include it in the general knowledge of candidates.

Mr. SLIPPER did not object to the metric system, but thought it should be part of the technical instruction obtained by the candidate during his apprenticeship.

Mr. CORDER said he lived in a rather out-of-the-way part of the world, and yet in all the schools with which he was acquainted, namely, the grammar school in Norwich, the commercial school, and the county school, the metric system was taught. Apart from that, was it any great grievance to be required to learn that which any ordinary boy could learn in a day without difficulty? and surely it could be no great injury to anyone that a little extra knowledge should be given to a boy. He never found himself that information of any kind did him any harm. This rather reminded him of a story of a man who was standing outside a wild beast show. The manager came out and said, "Walk in, gentlemen, I can let you see a Babylonian lion." The man said, "I bet you a sovereign you can't.,' He said, "Done," and took him into the show, brought him in front of the cage and said, there was the Babylonian lion. The man said, "I don't see it." The keeper replied, Don't see it, why there it is in front of you." But the man's answer was conclusive. "I was born blind."

Mr. MARTINDALE asked Mr. Slipper if he could name any public school in which the metric system was not taught. That system was universally adopted throughout Europe, and though they were very much behindhand in England, he hoped it would soon become general.

Mr. VIZER endorsed what had been said with reference to the premonitory letters being sent to offenders. He thought it was time that these letters were put in the fire instead of the post office. The law had been in action for some years now, and it was well known, and every one who infringed it ought to be dealt with as an offender. Honour should be given to those to whom honour was due: he gave the Council every credit for what it had done; but there were two paragraphs in that report which he thought might have been altered, namely, those referring to the Dentistry Bill and also to the Apothecaries' Company *v.* Shepperley. He thought it would have been better if in each of those cases some recognition had been given of the very efficient support, he might almost say guidance, given by another Association, not a Birmingham Association but an Association of the trade generally throughout the country. With reference to the examinations, he also thought the students should be told in what branches they failed, because it put them at a great disadvantage not to do so. Lastly, he thought the thanks of the meeting ought to be given to Mr. Owen for the great amount of work he had done in connection with the Benevolent Fund, especially in gaining admission for children into orphan asylums.

Mr. HANBURY wished to inform Mr. Vizer that so far as the Dentistry Bill was concerned, some days before the meeting took place of the Association referred to, he had an opportunity of seeing Sir John Lubbock, who at once fully acceded to all that the Council or the Society desired to have done, so that the matter was practically settled before that action was begun to which Mr. Vizer alluded, and there was not the slightest reason for referring the change in the Dentistry Bill to the action of anybody outside the Pharmaceutical Society. He did not in any degree undervalue the operations of the Trade Association, but it was only right to state the true facts.

Mr. VIZER said, he did not think the Council would lose anything by recognizing the work of the Association.

Mr. SYMONS (Barnstaple) said the observation of Mr. Hanbury reminded him of what he was told by the Secretary some years ago with regard to the jury question, and probably the Secretary's experience in that affair would lead him to conclude that it was not well to consider a question settled because Sir John Lubbock had agreed to leave out certain words. With regard to the Jury Bill the thing went forwards and backwards several times, was settled and unsettled repeatedly, and if it had not been for the accident of meeting with Lord Wensleydale in the lobby of the House of Lords, they might have been overthrown after all. He did not wish to introduce any element of discord. He had been connected with the Society for some years, and also for a year or two with another Association, and he must say he had been sorry yesterday to hear some remarks made with regard to the parent Society, and had also seen with regret some injudicious words which had appeared in the Journal. The truth was, as had been said yesterday, the Trade Association could do work which the Society could not do. There was work for them both, and why should they be in any position of antagonism to each other. Holding these views he intended at a later period to propose a resolution to this effect. "The shareholders trust that the Council of the Pharmaceutical Society will co-operate with the Committee of chemists and druggists of the Trade Association in bringing about a satisfactory settlement of the dispensing and prescribing question, and that they will contribute £50 to the special fund now being raised by the Trade Association to accomplish this and other objects for the general benefit of chemists and druggists." He hought it would be useful to pass that resolution in order to remove any feeling of jealousy which might have sprung up in some minds. He also heard yesterday some remarks about the scientific character of the Journal. He thought it ought to be of that character. He was very pleased to see those articles on the Month; but there was another department which was attempted for a little while, some short time ago, and then given up, he did not know why, namely, an article dealing with the drug market, perhaps not every week, but a monthly review of the trade. He was not in time to hear the remarks of the President with regard to proprietary medicines, but it would never do to give them up. At the present day many physicians prescribed proprietary medicines. He had seen prescriptions ordering them, and it would be perfectly impossible for the chemists and druggists to give up dealing in them. They ought rather to try and keep the trade for themselves. Anything like direct legislation they could not carry, and some of the observations made in the correspondence which had lately appeared were perfectly absurd. But he remembered some practical remarks once made by a late member of the Council, Mr. Edwards, on a question which was agitated before the present bill was carried, when he said that anything which could be done must be done indirectly. They had a policy to pursue in that respect by some enlargement or amendment of the present Bill, and it was only in that way that they could secure that branch of the trade for themselves. He did not see why there should not be a third schedule of poisons including articles which should require a caution label, and a clause introduced requiring the proprietors of patent medicines containing poison to specify the quantity of poison contained in the article on the label, and confining the sale of that kind of medicine to registered persons. It would not then be worth the while of outsiders to go in for patent medicines at all.

The PRESIDENT begged to remind Mr. Symons that the Council of the Society had no antagonistic feeling whatever towards the Trade Association.

Mr. MACKENZIE (Edinburgh), said it was not often that members from Scotland could come to those meetings and as he was there he had ventured to make a few remarks, but they would be made in the best possible spirit, and he hoped they would be received in the same manner. He would say very little about the report except that to his mind it was rather remarkable for what it was not than for what it was. He should have liked to have seen in it that the Council had done more for those in the trade. The desire in his mind was that there should be that unity in the trade which there ought to be, and there were from time to time grievances arising out of the action of the Council, which never could secure that union unless they were removed. He was in the habit of canvassing gentlemen to join the Society and had been successful in many cases, but the first question always was, "What has the Pharmaceutical Society done for us and what will it do?" This was a question very difficult to face. As had been said already it would rather seem as if there was an enemy in the camp than that they were all friends, because the Council was allowing the coroperative stores to do what it denied its own members the privilege to do. Was that what they had a right to expect from the Council? The members of the Council were in the position of managers and magistrates, but they were not a terror to evildoers. The time had gone by when these warnings could be put aside; it was unfair to the trade and to those who paid their guinea a year. The Council ought to take a wide view of the trade—not a London or Oxford Street view of it, but a wide Great Britain view—and it would thereby become more popular, for in many districts it was not so popular as he should like to see. With regard to the examinations he did not think it altogether just not to tell young men where they failed, and if this were adopted the Council would gain an immense amount of popularity and would lose nothing. With regard to some of the figures which had been mentioned he thought that officers should always be well paid, but he would make the financial report so plain as would prevent any one rising and quizzing out things which ought to be stated distinctly on the face of it, and he hoped in future the report would be so framed as to prevent the possibility of any such questions being asked again. It had been said by some that there were those in the trade who did not act as they would like to see, for their own interests and certainly not for the trade generally. There was an old adage "To know the disease is half the cure." In many cases those people had made complaints to the Society of parties in their neighbourhood doing certain things, but no one interfered with them, and then they got soured and said, "What are we to do if the Society will do nothing for us? We must compete with these people." If the Council were more decided in its action these evils might be prevented, and he hoped the day was not far distant when the large amount of money the Society had would be more generously spent. There was an old saying "There is that scattereth and yet increaseth, and there is that withholdeth more than is meet but it tendeth to poverty." If the Council would act upon that, and scatter the money more widely for educational purposes he thought it would be well. He should like to see the subscription reduced to half a guinea, but he would rather see it remain as at present and more money spent.

Dr. SYMES (Liverpool) said the President had referred to the papers read at the evening meetings, and it was rather suggested that the evening meetings in London did not receive so much support as they ought to. The country associations also felt the necessity of the same thing and found as great difficulty in getting papers as the parent society did, and the existence of these country associations was very essential to the welfare even of the parent society. At one of the recent Council meetings some remarks were made with regard to papers sent from the country for publication, and it appeared then to be the opinion of the Council that persons reading papers should be entitled to receive copies if they were read in London or Edinburgh, but it was distinctly understood that there was a great difference in papers read there or in Edinburgh and those read at provincial associations. Unless he misunderstood the report, it ended in this, that copies should be given to authors of papers read in London or Edinburgh, but no such permission was granted for members in the country. He failed to see the difference, and he was quite sure the Editor would agree with him that a great deal of the valuable matter in the Journal originated more or less with country members. As seconder of the motion, he would remind some gentlemen who spoke earnestly on the question of going to Parliament that that was not without danger. It was a matter which would require gave consideration, for they might find that they not only got what they asked but something more which would be very unpleasant. They could not expect to get the rose without the thorn. Several speakers had agreed in condemning the action of the Council, but they had done so in good part, and it was quite true that many country members would put that question, "What had the Council done for them?" Those who had agreed in condemning the Council for not having done enough had also agreed that they did not do enough to help themselves, and he certainly felt that it was their own fault in a large degree that many of these evils existed. One he would particularly point out, namely, the sale of medicines by small shops in country towns. He did not think they should condemn that so loudly when nearly the whole of those shops were supplied by chemists themselves, for when he was an apprentice a great part of his occupation was to put up pills in packets of small quantities to be disposed of in this way. It was useless, therefore, for one half of pharmaceutists to supply these shops and the other half to complain of their selling them. He could speak personally of the very courteous manner in which the examinations were conducted twenty years ago, for he was certainly asked nothing which he ought not to know, and every candidate was treated with the greatest kindness, especially those who were nervous, and he remembered that one gentleman was so overcome when he got into the room that he had forgotten his own name. That was twenty years ago, but when he mentioned this fact very recently at a dinner in Liverpool he was immediately corroborated by a gentleman who had only recently passed his examination. With regard to patent medicines he was sometimes ashamed of the extent to which the medical profession prescribed these things though ignorant altogether of their contents. Reference had been made to the Journal. They all recognized the distinction between the two leading journals which between them gave all the information they could require, and he thought it would be quite impossible to blend the two together. The Society's Journal gave valuable information on matters which were useful for reference, and the *Chemist and Druggist* would keep them well posted up in trade matters, but he could not see that the introduction of price lists and such things into the Journal would benefit them very much, while it would be only interfering with another publication which supplied them with that kind of information perfectly.

Mr. Chipperfield said it was often alleged that the Pharmacy Act conferred certain privileges on chemists, but, as had been well said, the only privilege was the sale of poisons, and that they did not care about. The question arose whether it was not possible for their privileges to be increased and enlarged, and for the Pharmacy Act to be so altered or some other Act passed which would give increased privileges to registered chemists and druggists, and prevent unregistered persons from selling any medicines except certain simple things which might be sold with impunity by anybody and everybody. It might be said that that was not right to the public, but the same thing was done in other cases. It was very desirable for every one perhaps to live in the immediate neighbourhood of a qualified medical practitioner, but still there were hundreds and thousands of villages too small for a medical man to obtain a living in, and yet the law would not permit an unqualified practitioner for the benefit of the public to practise as a medical man there. Would it not then be right to enlarge the privilege of chemists and druggists so that they only should be allowed to dispense prescriptions of any kind whatever, or to sell any medicines except those of the most simple character? He threw that out for the consideration of the Council. But with regard to the prevention of co-operative stores selling poisons, his opinion was that the infringement of the Act by co-operative stores was infinitesimal compared with its infringement by chemists themselves. There was a time when he used to sell a fair amount of poisons, but since they had to be registered, and, in compliance with the law, he had required persons wanting Battle's Vermin Killer to sign their names, and go through the requsite formality, he had found that they looked very sour over it, left the shop, and nine times out ten he never saw them again. He had no stores in his neighbourhood, but they must get these poisons somewhere else, and he believed that three-fourths of the chemists did not carry out the Act, but when a customer raised any demur simply told him to take care of it and supplied him. Some remarks had been made about medical men recommending proprietary articles, and only recently he had a patient come to him with directions from his medical adviser to ask for a castor oil pill. After what they had heard about those things in the Journal he was rather surprised at this. He regretted to say that with all the efforts of that or any other council to further the interests of chemists and druggists, there must be a large number amongst themselves who were doing more harm to the trade than any Council or Defence Society could counteract. He feared the day was coming when a thorough revolution must take place in the trade. Things could not go on as they were. In every large town there was some unprincipled person who commenced selling drugs and proprietary articles at such a price that only one in such a town could get his living by doing so. When this course was pursued others would naturally retaliate, and the end would be that half the chemists and druggists must go to the wall. It had been pointed out to him also that there was an injustice with regard to the annual subscription required to be paid by gentlemen who passed the Minor or Major examination. So long as a young man remained a Minor he was only required to pay 10*s.* 6*d.*, but the moment he showed he had more brains, and passed the Major, they said to him, "Well, you are a clever fellow and you must now pay a guinea."

Mr. G. H. Wright said with regard to the remarks just made that the injury by the co-operative stores was infinitesimal, he was only informed the day previously that one store did many thousands of prescriptions in a fortnight.

Mr. Chipperfield said he only referred to the infringement of the Sale of Poisons Act.

Mr. G. H. Wright said a barrister who was an old customer of his had some medicine made up which came to 2*s.* 6*d.*, but shortly afterwards he came in and in a very friendly way said that he had been to the stores and they only charged him 8*d.*, adding, "You must get a rattling profit." He had never seen his prescriptions since.

Mr. Symons wished to explain that he did not advocate putting any price lists in the Journal, but referred rather to a monthly review of the drug market.

Mr. Humpage said there were two paragraphs in the report which he had read with a great deal of satisfaction. He believed they were unanimous in thinking that the Pharmacy Bill was not perfect, and therefore a Committee had been appointed and that Committee had made a report which would lead to some action. He could only say he hoped the Act would be so altered as to meet many of the difficulties which had been referred to. As to the grievance of a chemist in a large town underselling his respectable neighbours, what could the Council do? He should suggest that such a man should be called upon, and that it should be pointed out to him what an unfair, unkind, ungenerous thing it was for one man to undersell his neighbour in order to steal an advantage over him. If he would not be convinced, there was but one other course to pursue and that was to give him the go-bye, or what perhaps would be more effectual, although there might be some difficulty in carrying it out, for the trade in the town to co-operate and open a shop which should sell things still cheaper. With such a rod held over him he doubted much whether he would persist. What he could do others could, and what would be the result if all did it? They would all go down in a lump. Then they were told that no legislation had taken place to their detriment during the past year, and of course they endorsed that. But who had they to thank for it; it is no use disguising the fact. Those who were present at the dinner last evening had heard from eminent members of the medical profession what position they held, but there was a section of the medical profession which did attempt to starve them and deprive them of their rights. He had referred once before to the foundation stone on which the Society was built, and to the legacy of £800, the object of which was to elevate the Society in its social and educational position, and also to protect the legitimate interests of the trade. Until it could be shown that the chemists and druggists had no right to prescribe over the counter and to give a gargle for a sore throat to any one who came in for it, they should continue to do so, not on sufferance but as their right. It was clear to his mind that when any legislation was attempted a deputation should be appointed immediately to wait on the promoters of the Bill, and point out what its effect would be. When this was done they often were quite surprised, and said, "Oh; we didn't read it in that way." There were two ways of reading everything. They knew the tale perhaps of the man who wrote up over his door, "What do you think I will shave you for nothing and give you some drink." Two men went in, and thought they would get shaved and have something to drink for nothing; but the proprietor said, "Oh! you didn't read it correctly. This is the way to read it. "What! Do you think I will shave you for nothing and give you some drink?" He trusted that as there had been some communication with the representatives of the Apothecaries' Company some understanding might be come to by the Council before any measure was brought forward which should contain clauses of an ambiguous character, so that it might be clearly understood what the effect of the words would be. They admitted that any chemist who arrogated to himself that he was a medical man, and so represented himself, was a rogue; but he also maintained that a chemist had a perfect right to do as he had done for forty years past, to prescribe according to his own judgment. Then, again, the scheme of the Dental Hospital. When they proposed to confine to themselves the term "dental surgeon," he did not blame them, but when they asked that every chemist and druggist throughout the country should give up the power of calling himself a dentist and taking out teeth it was absurd, and he believed many chemists did it infinitely better than a regular doctor. They knew a little about these things, and how it was done, especially if the doctor did not happen to be at home. Let every educated gentlemen have his real title, and let those who wished to take his title from him be pointed out as committing a fraud; but they were not to give up their own rights.

The PRESIDENT remarked that the present position of things was, he believed, exactly what the last speaker had described, viz., that any man who deceived the public by proclaiming in any way that he was a medical man, or had a medical title, would be most properly punished, and he certainly would not be defended by that Council; but those who, as chemists in the conduct of their own business, did prescribe simple remedies would be held harmless. With regard to the Dental Practitioners' Bill he might inform the meeting that the previous night it had been ordered to be reprinted, so that in a day or two they would see what form it would take, and it would, of course, be watched by the Council and the Parliamentary Committee.

Mr. OWEN wished to say in reference to a remark which fell from Mr. Vizer, that he was only one of the Benevolent Fund Committee, and that an injustice would be done to other members by naming him personally. He had perhaps done a little more than some members, but any thanks were due to the Committee itself, and particularly to their friend, Mr. Robbins, who had greatly promoted the work they were engaged in, and had succeeded in carrying out the maxim which had been mentioned, "There is that scattereth and yet increaseth." They had scattered more than they ever did before, and the Fund was in a much better position.

The PRESIDENT reminded Mr. Urwick that if the subscription were reduced to half a guinea the members would really get all the advantages of membership for nothing, because the Journal was well worth the ten shillings and sixpence.

Mr. URWICK quite agreed that the Journal was valuable, but the question was what were they to do with the money.

The PRESIDENT said the funds would be employed as soon as they could see how to do so without wasting it.

Mr. URWICK said although the Journal was worth the 10*s.* 6*d.* it was produced for a much lower sum; and he thought the members were entitled to obtain it, therefore at cost price; at any rate if they acted on the cooperative principle.

The resolution was then put and carried unanimously.

THE ADMISSION OF WOMEN AS MEMBERS.

Mr. WADE then moved the resolution of which he had given notice—

> "That all persons being duly qualified (irrespective of sex) shall be eligible for admission into the Society in accordance with the Bye-Laws thereof, and this Meeting is of opinion that ladies should not be excluded from participation in the privileges of the Society."

He ought perhaps to apologize for taking upon himself the raising of this question, but he had been led to believe that it would be more agreeable to the Council if such a resolution came from an independent member than if it came direct from the Council and therefore he had not hesitated to take upon himself the responsibility of placing this matter before the annual meeting. It was five years since the question was brought before the Society, and no doubt a number of fresh faces were present, and some might have forgotten what then took place, so that he might recapitulate to some extent what then passed. It would be remembered that Mr. Hampson in a very able speech said it was only fair and proper that ladies who had complied with the Act of Parliament and had passed their examination should be admitted to membership; and without depreciating or in any way disparaging those who differed from him on that occasion he might fairly say that the most intelligent and influential portion of the members who spoke held the same view as Mr. Hampson put forward. There were certain gentlemen who differed from him. Amongst others Mr. Pickering, who moved an amendment that the subject be adjourned *sine die*, and immediately commenced to argue the question on a false issue and misled the meeting; and he partly attributed to that misleading the fact that the vote was carried against Mr. Hampson. Mr. Pickering argued the point not whether ladies should be admitted as members of the Society but whether they should be admitted into the trade of chemists and druggists, and thereupon a strong feeling came out that if it was possible then and there to prevent ladies becoming chemists and druggists then was the proper time to do it; and the amendment was carried which adjourned the question *sine die*. Now they were not to discuss the question whether ladies were to come into the trade because the law had settled that long ago, and whether they liked it or not, they could not help it. The ladies were in the trade; they had been educated and examined by the Society and were engaged in the business and he should like to know from that meeting whether it still considered that it was right that having conformed to all the regulations of the Act they should still be debarred from enjoying the privileges of the Society. They were registered and qualified according to the Charter, Bye Laws and Acts of Parliament, but they were disqualified according to the opinion of some members because they were women. Mr. Sandford, who was a most honourable, open and straightforward opponent, had told them that there was one disqualification of ladies, and that was because they were women. That had never been disputed, but he also said that the Council had not refused to admit ladies into the Society, but that certain names having been submitted to the Council they had been rejected, and that if the ladies felt themselves aggrieved they had the right of applying to the Court of Queen's Bench for a mandamus. Now if ladies had the right, and he did not think it had been disputed, except that they were women, why should they be put to the expense of going to the Court of Queen's Bench simply to satisfy the opposition of what he might call pharmaceutical misogynists? Mr. Betty was horrified at the idea of the two sexes being educated together.

The PRESIDENT said they were not discussing the point of education, but whether ladies should be admitted as members.

Mr. WADE said he was referring to this matter because members of the Council had brought it forward in argument against the proposition. Mr. Betty was horrified at the idea of the two sexes being educated under one roof, and drew what he considered to be a very unfair analogy between boys and girls being educated at Eton, Harrow, and Rugby, and the two sexes being educated under that roof in Bloomsbury Square. If they considered what went on in the Art Schools at South Kensington, Bloomsbury, Lambeth, and throughout the provinces, it would be found that there were thousands of students of both sexes earnest in their work who were pursuing their duties in such a way as they must approve of; and who was there who should dare to say a word against the students under Government in the Art Schools? They had the same professors and attended the same lectures, and he maintained there would be in more harm in the Pharmaceutical Society than in the Art Schools. Such were the sentimental and personal objections raised five years ago. Legal objections there were none, because when the Solicitor was applied to he had not made up his mind on the question. He did not know whether he had done so now, but he remembered the only thing he held then was that this Society being a voluntary society the members had a right to be placed on the register, but those who who were registered had not the right to become members of the Society for this reason. He argued that in 1842 when the Charter was granted there was no condition made for ladies to come into the Society; it was never contemplated that they should do so, and because now ladies did contemplate coming in it was looked upon as something astonishing. There were no grounds, he said, for supposing they should come in; but he, Mr. Wade, maintained that if they did not make a special provision that ladies were not to come in those ladies had a perfect right to come in if they could not be kept out. There could be no legal objection brought forward to their being admitted; what did the Charter say? Line 70 said that members of the Society shall be those who were either in business at the time or who afterwards shall have become qualified for membership by examination. It did not say anything about their being women; and line 105 said that the Council itself should examine or shall employ others who shall be examiners to test the qualifications of persons when they came up for examination; and if it were found that they were able to fulfil all the conditions of the Act so that they were worthy of becoming chemists and druggists, they should be represented to the Council as worthy of election. He maintained that those ladies had shown themselves worthy of election. They had applied for it, and, contrary to the Charter, they had been denied admission. Who were those ladies who were objected to? Were they strong-minded females who were coming there to upset the institution? Were they clamouring for seats on the Council with an ultimate view to the Presidential chair? No; they were simply a few ladies, young maiden ladies, who had come simply for the purpose of asking the reward of their industry and labour. Not a word of reproach could be said against any lady who came to that establishment asking to be elected a member after having fulfilled all the conditions of the Act. He asked the Society not to be generous but simply to be just; to put aside the feeling that they were performing any gracious act, but to hold that ladies were justly entitled to what they asked. In giving them what they had a right to, members would not be taking anything from themselves. They would still have as much sunshine as if those ladies were not in the way. Therefore, he asked them to reverse the resolution come to five years ago and to vote for the ladies, not because they were women, but because they being men were willing to give that which was a woman's right.

Mr. KEER seconded the motion.

Mr. VIZER said he should move an amendment to Mr. Wade's resolution.

Mr. CHURCHILL asked what was the amendment.

The PRESIDENT read the amendment which had been handed in, viz.:—

"That in the opinion of this meeting it is not considered desirable to admit ladies as members."

Mr. CHURCHILL submitted that was not an amendment but a simple negative.

Mr. VIZER said he was glad of the opportunity of bringing forward his amendment, inasmuch as he was almost afraid, when he read a report of the Council meeting some time ago, that certain members seemed to think that the Council was not in any way bound by the action of a general meeting. He must confess he was sorry to hear such an expression, because such vote was deliberately taken, and as this would be a question of vital importance, it ought to have due weight with the Council, not only by courtesy but by right. The amendment he should move would be this:—

"That in the opinion of this meeting it is not considered either necessary or desirable that ladies should be admitted as members, associates, apprentices, or students of this Society."

His reason for enlarging it was because he thought they were steps one from another, and that if they educated them as students they logically must go on step by step and admit them as members. He would ask two questions: Were they, as a Society, compelled to receive ladies as members? and next, Were they doing those ladies any injustice by declining their presence as members? With regard to the first question his own feeling decidedly was that they were not called upon so to do. A great deal of capital had been made out of that clause of the Act of Parliament which said, that "Every person registered as a pharmaceutical chemist shall be eligible to be elected as a member of the Society. Hence it was argued that because they were eligible, therefore they must of necessity be admitted. He could not see any analogy between the two. No one would venture to say that because a person was eligible to a post that of necessity he must be elected to it. A lady might be fully eligible for election to the post of commander-in-chief, but by reason of her sex she would hardly receive the appointment. So also a young gentleman might be fully competent to take charge of a large ladies' educational establishment, but it could hardly be expected he would be appointed to that position. On the other hand, ladies were eligible and serviceable for certain public appointments, such for instance as the School Board, where their presence was valuable; but with regard to their own Society, things were decidedly different. If ladies were admitted to membership they would have a right to take part in the general meetings, to sit on the Council and to have a voice in every legislative point in reference to the Society. He must confess, that as a Society pre-eminently composed of gentlemen, the legislative powers ought to be carried out by gentlemen solely. But were they doing these ladies any injustice? He contended they were not in the slightest degree, but they were doing them the utmost justice in feeling that they ought to keep their position as ladies. He felt satisfied that in the present day there was an attempt by some parties to put the female out of her position, and were thus doing the female sex injury rather than good. They liked to look up to ladies, to respect and love them, not to feel that they were in antagonism to them. It was not a question whether they should admit ladies to the business; that was clear, they were already admitted to every privilege in connection with trade interests. They could pass their examination and open a shop, and carry on business to the fullest extent. Therefore they were not deprived of any legitimate right in reference to making their way in the world. It had been said that a Member of the Pharmaceutical Society was thought more of than a Pharmaceutical Chemist, but he could not conceive that such an erroneous idea could ever be accepted. They might as well say that a Member of the Royal College of Surgeons was better than an M.D. Which was the higher degree? A pharmaceutical chemist was the higher position. Again, were they depriving the public of an acknowledged need? Was there any public demand for the admission of ladies into the trade or business? There was no such demand. Some time ago when there was a great outcry made about the admission of ladies as doctors, there was a certain class which felt that ladies had a right to be able to consult ladies in certain cases, and a question of delicacy was raised and it was said it was their right to be educated by the medical profession. But there was no such condition in their business, therefore they were not depriving the public of anything they had a right to expect. Were they to see a large body of ladies, after years' experience in business, coming forward and proving that there was a serious injury done them by their not being members of the Society, no one would be more willing than himself to put aside his personal feeling and admit them, but until that was proved he considered they had a perfectly legitimate right to say they preferred carrying on their own business for themselves without the assistance of their lady friends.

Mr. Mackenzie in seconding the amendment, endorsed every word uttered by the mover, and added that he felt it was a thing which might be lawful, but was not expedient. It was not necessary, it was not an injustice, and although they had done so much it was no reason they should do so much more. This subject seemed to him to have always been a bid for popularity, but notwithstanding that he should state his views openly, and he did it out of respect for the ladies. He had dwelt with those who had had to fight this same question in another sphere. On one occasion he had spoken to a person who had laboured long amongst the savage races of Africa, and he told him that we had one edge of the wedge here, but that they had the other end of it Africa. He believed that the action of some people in the present day was tending to reverse the order of civilization. There was no country under heaven where women had such a noble position, or were held in higher respect than in the British Islands. As long as any nation respected the Bible it would respect woman, and the reverse was decidedly the case; even in those parts of our own isles which approached most nearly to heathenism, there they found that woman did not receive that honour and respect with which she did elsewhere. If they put woman out of her true position they would be only bringing her back to that state of things which he hoped he would never see. They must treat things as they were around them; there was no necessity for this change, and there was no injustice inflicted. It was not within the meaning or spirit of the Act.

Mr. Chipperfield asked if the amendment in its amended form was in order.

The President said he thought he must rule that this was an amendment.

Mr. Owen asked how far they were going. They had ladies who were pharmaceutical chemists and who had actually passed at the top of the list; were they now to reverse everything they had done? Was the Council to be bound by the opinion of this meeting?

A Voice: Certainly.

Mr. Owen said if so he should decline to sit upon it if re-elected. If he went to the Council he should go to act upon his own judgment.

The President reminded Mr. Owen that the Council had passed a resolution that they would take the opinion of the meeting on this subject, and he thought that opinion would be binding on the Council.

Mr. Owen: Only for twelve months.

Mr. Hampson regretted that Mr. Vizer, who was generally right on pharmaceutical politics, was so grievously wrong in this case, but he seemed to be badly advised. It would be a very serious matter if such an amendment were passed, because it would exclude any female student from receiving instruction in that building; at least so he understood it.

The President said he did not understand the amendment in that way. He took it it would simply exclude them from being placed on the list as members, apprentices, or students of the Society. They could still attend the lectures.

Mr. Hampson said a few women had thought it advisable, in order to enable them to earn a livelihood, to follow pharmacy. The Solicitor, when consulted some years ago on the interpretation of the Act whether they could be examined or whether they would be excluded, advised that it was legal to examine them, and, in consequence of his advice, a certain number had been examined and had qualified themselves. Those present had heard a good deal that day about their rights, the words "rights and privileges" had resounded through the room several times, but there were also the rights of two or three women. If they were not permitted to become a part of that Society they were viewed as pariahs and outsiders and interlopers, and looked upon with considerable suspicion and distrust; at any rate, the Society would not give them any countenance. Now he thought, as the Solicitor considered it within the law that these ladies should be examined when they presented themselves, it was advisable in the interests of the Society that they should have something like a moral control over those ladies. It would be a misfortune if they were not admitted, because some of them might think they would go into the ranks of pharmacy, and do certain things which they had the power of doing, but which if they belonged to the Society they would not. He did not believe any lady member at the present time would have any disposition to do anything of that sort; but it was only a matter of justice to admit them. It had been said there was no injustice in refusing, but he maintained there was a distinct injustice. In the first place, they were pharmacists in the eye of the State, and had to obey certain restrictions made by the State. That Society had the power of altering those restrictions, and adding to them, and had certain legislative functions which they must comply with. Now, in simple justice, lady members ought to have some voice, however slight, in the actual management of the Society. Besides that, they were excluded from the museum; they had no right there simply as examined persons, but only came on sufferance. Again, if they wished to take the *Pharmaceutical Journal* they would have to pay full price for it, and they had also the disadvantage of not using two titles which he believed many persons considered to confer a commercial advantage. In the country he knew the title of Member of the Pharmaceutical Society was considered to be at any rate equivalent to the title of Pharmaceutical Chemist, and even the initials "A.P.S." were often seen in shop windows, and were considered of commercial value; thus a direct injustice was done by excluding any person who was eligible. But he would rather appeal to their sense as gentlemen and men. He felt that in holding out the hand of the Society to them, and admitting them within pale of pharmacy, they were simply doing an honourable act, and it certainly would not add to the honour of the Society to exclude them. It could not be doing it any injury to confer an additional strength on a few women. Was there anything to fear for the Presidential chair? Not the least. Or that they would come and turn out the masculine element on the Council? Not the least. In the distant future it was quite possible, in 200 years time when the Society would probably be no longer ashamed of a few women being admitted, there might be some eminent woman pharmacist who had entered into original research who would be an honour to this Society, and it was desirable that if there was any talent in the women who had the temerity to enter their ranks that they should be welcomed. Then to take the public aspect of the question, it was said that there was no clamour outside that women pharmacists should practise. It might be true, but he could quite understand there were many things a woman would prefer asking a woman for in a chemist's shop to asking a man, and if there were a certain number of ladies who would prefer a few women pharmacists they had a right to their opinion. After all, it would depend upon that, for if they did not fill a public want they would soon die out and the Society would not be troubled with them.

Mr. Mackay had listened to the eloquent speeches of the gentlemen who had just spoken and to the endeavours which had been made to show that a great injustice was about to be perpetrated if they declined to admit females to membership, but he had failed to gather the smallest speck of injustice in the matter. It was not the wish or intention of any one connected with the Society to close the door of the lecture room against females or to prevent their being examined, opening a shop and dispensing, or that they should not participate in their grand Benevolent Fund. So far from that being the case he understood all were desirous that they should have all privileges, and with regard to their feeling towards females who had once been in business and who from misfortune or failing years had been obliged to apply for relief, he knew of one case in Scotland where on two occasions the Benevolent Fund showed a proper appreciation of her case and gave assistance. He had made special inquiries in Edinburgh as to the feeling of the members there, but could not find one wish that females should be admitted to membership. He had attended every meeting for examinations from the first, and throughout the whole of that time they had never had but one female who came before the Scotch Board. She failed the first time, particularly in dispensing, but to her credit she again studied, came up the second time, passed, and was put on the register. Speaking of Scotland it would be found that every female on the register was admitted under the 1868 Act, so that as far as Scotland was concerned the question was very much narrowed, and he did not see why they should open the door of the Society to ladies.

Mr. Long said Mr. Mackenzie had so thoroughly expressed his view, that he would not detain the meeting with any remarks. He did not think it made much difference one way or the other as to the practical result, but at the same time, as society was being so thoroughly upset in all its bases, they had better not add to the confusion.

Mr. Urwick said ladies were admitted by Act of Parliament, and they were doing them an injustice not to carry them on into the higher stages of the Society. By doing so he felt they would exercise a good influence on them when they went into business, which would lead them to conduct that business properly. It was always felt amongst themselves to be a good thing to influence the rising generation to join the Society, because it kept them from carrying on a low kind of business, and so it would be with ladies; if they were admitted they would have a name and position to sustain. One of the maxims which had been most thoroughly instilled into his mind was "Do to others as you would be done by."

Mr. Fryer (Scarborough), said he felt so strongly on this question that he had come from the north of England almost on purpose to say a word or two in support of Mr. Vizer's amendment. He was not aware that such an amendment was going to be brought forward, but he should thoroughly oppose the motion of Mr. Wade.

The President said the Solicitor had pointed out to him that the best way to take this vote would be not on the amendment, but simply on Mr. Wade's original resolution, striking out the first part which was unnecessary, and confining it to these words—

"That this meeting is of opinion that ladies should not be excluded from membership of the Society."

Mr. Vizer did not see why his amendment should not be put.

The Solicitor said the question put in that form would raise the simple isssue contemplated, whether ladies should or should not be excluded from membership.

After some conversation on the form of the resolution it was arranged that the vote should be taken on an amendment to be moved by Mr. Vizer of the previous question.

Mr. Chipperfield said they had been told in the Journal that the age of chivalry would be gone if ladies were admitted as members of the Pharmaceutical Society, but he took it that a more unchivalrous act could not be perpetrated than to refuse them admission. No one would deserve the name of a chivalrous man who would simply refuse admission to any person because of her sex. The Solicitor had told them they were not bound to admit any one to the privilege of membership unless they thought proper, but they never had refused any one who had passed their examination he believed.

The President said they had certainly.

Mr. Chipperfield: To men?

The President: Yes.

Mr. Chipperfield: Then you had a good and sufficient reason.

The President: Certainly.

Mr. Fryer thought they had had a great deal of dust thrown into their eyes on this question. Mr. Wade told them that it was unjust to exclude women from membership, but did not attempt to prove it, he merely made the assertion. Mr. Hampson had attempted to prove it in one or two points; one being that they were pharmacists in the eye of the State, and therefore they would be doing them an injustice in refusing them the further title of members of the Society. He maintained this was no injustice. The State regarded a woman in a totally different light to a man. He very much objected to the motion as it originally stood, where it said they must proceed irrespective of sex. The State did not proceed irrespective of sex; there were privileges accorded to women which were not accorded to men. They were exempted from the police service and from the army and navy; they might have all the qualifications, but because of their sex the State excluded them. That was a Society of men, and they were doing no injustice to women in excluding them.

Mr. Atkins said he was not going to discuss the matter but wanted to clear up a preliminary point. He was one of those who had to go to the country, and possibly he might not have the honour to be returned at the next Council; but he wanted to know, if he were returned, in what position the Council would stand. He had heard in the Council that this matter should be referred to the General Meeting and was glad that they had had so many opinions expressed; but what he did protest against, with all due submission, was this, that if the meeting to-day recorded a vote, as probably they would not by an even number, but by a preponderating majority, the Council were bound to register its decision. That was an important point, and the Council ought to have a most distinct conviction upon it. If the Council were simply to register the decision of that meeting the members became simply delegates.

Mr. Bostock said he had come a long distance to attend that meeting. In his own neighbourhood there were several females conducting the business of chemists and druggists with great credit and success. In one instance, the husband had got into such bad company that he came almost to ruin and had to emigrate, but his wife had continued the business with great credit to the present time. In another case the man was laid aside by sickness through overwork, and his wife for twelve months had conducted the business, and had since carried it on for the last fourteen years. He knew of another case also, and none of those three ladies had ever dishonoured the profession. He would suggest as a compromise that they should admit them to the Society when they passed their examination, because they had a moral right at any rate. They were going to meet them that evening at the conversazione, and if they sat by their side in that room he did not see what harm would be done. If they had ladies passing the examination it would stimulate the young men, and he felt sure that if this resolution were passed, they would never regret it. He would also suggest that all their subscriptions should go to the Benevolent Fund.

Mr. Sandford was as anxious as his friend Mr. Atkins that this matter should be referred to the annual meeting, but he did not take the same view of it. That gentleman spoke of the new Council being merely delegates, but he thought in a great question of this kind, which positively altered the constitution of the Society, they were bound to follow the wishes of the members generally. Mr. Wade commenced by very kindly alluding to him as having taken the benighted side of the question, but he still adhered to the same opinion, and to the principle of keeping women in the social position in which God had placed them. He would never interfere in any way with the rights of women, but he believed that the best of women would only be too glad to silence those who were too anxious to push themselves forward. When Mr. Hampson asked if they were afraid of being pushed off those benches, he must entirely demur to that charge, but he thought it possible that ladies who would like to come there were ladies who wished to wear the breeches, and he must say he should be exceedingly sorry to find women taking part in the business of the Society. They surely would not send women to Parliament. Women were on the School Board, it was true, because they had to regulate schools for girls as well as for boys, but this was an altogether different case. They did not interfere in any way with the privileges conferred by the Benevolent Fund, or take away their right of carrying on business, or passing examinations, or being educated. They would give them the highest title they could have, that of the Pharmaceutical Chemist. The other day, when the Duke of Richmond introduced his Medical Act, he drew attention to a certain point in it; there had been great discussion as to the right of women to be examined, and it was found that Mr. Russell Gurney's Act in one respect required amendment. That was an Act requiring women to be examined, and it was so drawn as to enable women to be members of the corporation and senate, which was never intended. By this Bill of the Duke of Richmond, women would be debarred from those privileges which they were now seeking to give them in connection with that Society. He had been attacked in one of the medical journals as encouraging counter prescribing, because he said there five years ago that they were often in their shop asked to give advice—he did not mean medical advice—but to give advice in some matters which could not fairly and decently be brought before women. He repeated, they did hear in their shops continually things not fit for the ears of delicate females. Some one said they were admitted by Act of Parliament; but it was not so: they were admitted to examination and registration, and to the full power of carrying on business. He hoped the effect of the vote would show that it was not the desire of the Society to admit women as members.

Mr. Hicks said it was very well for Mr. Sandford to speak of the inexpediency of women becoming members of the Society, but those who had wives would be often glad to have them standing behind their counters and of obtaining from them that help which it was only fair and right they should be able to obtain. He had the pleasure of sitting on a School Board of which a lady was a member, and she was the best member on that board, and that not only with regard to matters relating to girls, but with regard to the general work of the board. It was said, what injustice did they do them? Simply this. They said to them virtually, whatever talents you possess, however good an examination you pass, you must stand in a subordinate position. We are the lords of creation, and although your talents may be superior to ours, and you pass a better examination, you must stand there while we take a higher position.

The President said women could become pharmaceutical chemists just the same as men.

Mr. Hicks said he was not aware of that before, but the Society had to legislate to some extent for the whole body, or to influence legislation, and it seemed to him very hard, seeing these ladies were engaged in business, that they should not have a voice as to what laws should be made. He could not understand why they should not be admitted, nor had he heard anything like a sufficient reason given. They should remember the golden rule which had been alluded to—"Whatsoever ye would that men should do to you, do ye even so to them."

Mr. Wade said there was very little for him to reply to. He must say the whole of Mr. Vizer's speech was apart from the question, and Mr. Mackenzie followed him in the same route. They still harped upon the question which was not before the meeting. Whatever might be his own proclivities, if the question were whether it was right for ladies to come into the trade he should not have ventured to bring it before the assembly. That was what had been argued, and the spirit of that had been carried through whether it was desirable women should be in the trade. But that was not the question. There were ladies who had come into the trade, and he had no doubt they had a good reason for it. Mr. Mackay and others had shown how very few had come in; in Scotland there was hardly such a thing known. Therefore there was no danger whatever of the Society being upset by the number of ladies coming into it. If such was the case, why should they be debarred from coming? The President in his opening address drew a pretty picture, and he hoped he might live to see it, when the chemists and druggists' business would be of that delightful character that counter practice would be put aside, no naughty things would ever be uttered over the counter, and it would be one continual reception of physician's prescriptions. When the trade got into that happy state, and when they had nothing to do but to receive the prescriptions over the counter, and hand them over to the dispenser to be made up, a lady would be as competent to dispense the prescriptions as a man. He had heard nothing which could in any way affect the resolution he had placed before the meeting, and would therefore not detain it any longer, but simply ask it to confer on ladies the rights which he contended they had under the charter.

On the previous question being put, the President gave his opinion that it was lost by a considerable majority. This opinion being challenged, a division took place, when it was announced that the amendment was carried by 59 votes to 57.

Scrutineers having been appointed to examine the balloting papers for the Council,

Mr. Sutton proposed—

"That the cordial thanks of this meeting are due and are hereby tendered to the Council for the valuable services they have rendered to the Society and to chemists and druggists generally during the past year."

He said it was very easy to come there and make complaints of what the Council had done or omitted, but he had been an old councillor himself, and knew the business was very important, and was perfectly certain that up to the present time the Council had done its best for the real interests of the Society and for chemists in general.

Mr. Vizer seconded the motion, which was carried unanimously.

The following Registers were placed before the meeting by the Registrar in compliance with the provisions of the Pharmacy Acts, 1852 and 1868:—

Register of Members, Associates, and Apprentices of the Society.
Register of Pharmaceutical Chemists.
Register of Assistants.
Register of Apprentices and Students under the Pharmacy Act of 1852.
Register of Chemists and Druggists under the Pharmacy Act of 1868. Six volumes.

The meeting was then adjourned until Friday morning to receive the report of the scrutineers.

ADJOURNED MEETING.

Friday, May 17, 1878.

MR. JOHN WILLIAMS, PRESIDENT, IN THE CHAIR.

The Scrutineers brought up their report as follows:—

Scrutineers' Report.

We, the undersigned Scrutineers, appointed at the Thirty-seventh Annual General Meeting of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting papers committed to us, and report the following:—

Voting papers issued, 354[illegible]

Voting papers received		1872
Voting papers disallowed :—		
Informal	18	
Received by post too late	142	
Unsigned by Voters on envelope . .	9	
		169
Votes Registered		1703

Hills	1272	Atkins	1017
Savage	1268	Betty	977
Greenish	1264	Frazer	951
Schacht	1258		
Mackay	1252	Wills	923
Hampson	1209	Symes	915
Williams	1191	Andrews	886
Woolley	1183	Owen	792
Sandford	1142	Richardson	748
Fairlie	1137	Butt	438
Gostling	1109	Slipper	378

W. K. Hopkin, *Chairman.*

J. Horncastle.
C. E. Turner.
A. W. Postans.
A. Senier.
R. S. Bathe.
W. F. Haydon.
J. C. Ellison.
Maurice Howell.
C. Newman Holmes.
Arthur L. Savory.
F. Nicholson.
T. Edward Greenish.
G. F. Strawson.
W. Cadwaladr Jones.
Frederick Tibbs.
Walter Hills.
William Gulliver.

The New Council.

The Chairman then declared that the following gentlemen would constitute the Council for the ensuing twelve months:—

Atkins, Samuel Ralph, Market Place, Salisbury.
Betty, Samuel Chapman, 6, Park St., Camden Town, N.W.
Bottle, Alexander, 37, Townwall Street, Dover.
Churchill, Walter John, 46, New Street, Birmingham.
Cracknell, Charles, 217, Edgware Road, N.W.
Fairlie, James Mitchell, Charing Cross Corner, Glasgow.
Frazer, Daniel, 113, Buchanan Street, Glasgow.
Gostling, Thomas Preston, Market Hill, Diss.
Greenish, Thomas, 20, New Street, Dorset Square, N.W.
Hampson, Robert, 205, St. John Street Road, E.C.
Hanbury, Cornelius, Plough Court, Lombard St., E.C.
Hills, Thomas Hyde, 338, Oxford Street, W.
Mackay, John, 119, George Street, Edinburgh.
Rimmington, Felix Marsh, 9, Bridge Street, Bradford.
Robbins, John, 372, Oxford Street, W.
Sandford, George Webb, 47, Piccadilly, W.
Savage, William Dawson, 4, Park Road East, Brighton.
Schacht, Geo. Frederick, 7, Regent St., Clifton, Bristol.
Shaw, John, 24, Great George Place, Liverpool.
Williams, John, 16, Cross Street, Hatton Garden, E.C.
Woolley, George Stephen, 69, Market Street, Manchester.

Auditors.

There being only the requisite number of candidates (five) for the office of Auditors, the Chairman declared the following duly elected for the ensuing twelve months:—

Harvey, Edward, 6, Giltspur Street, E.C.
Hodgkinson, William, 127, Aldersgate Street, E.C.
Squire, William, 5, Coleman Street, E.C.
Stacey, Samuel Lloyd, 300, High Holborn, W.C.
Thompson, H. Ayscough, 22, Worship St., Finsbury, E.C.

The Vote on the Admission of Women as Members.

Mr. Giles then said: I think there is an important matter which I do not mention with any intention of embarrassing the Council at all, but quite the reverse. My object is that every transaction that takes place here shall be perfectly clear; that it shall not only be perfectly straightforward, which I am sure it is, but that there should not be the smallest doubt about it, and that it shall be perfectly intelligible to those outside. We did hear at the Conversazione on the evening of the public meeting, that some mistake had occurred in the announcement of the numbers who had voted on a question of considerable importance, or rather on the question which preceeded the question of considerable importance, that is, with regard to the election of women as members of the Society, those women having previously passed the examinations required by the Act of Parliament. As a life member of this Society I have the right, as it were, to speak here, and to attend and vote, but as no longer a living member I should certainly feel it my duty, and as a matter of good taste, to abstain from any interference with the policy and management of the Society, and I certainly should not have voted on that question at the annual meeting. But as a matter of fact I did vote upon the previous question, because I regarded that as a question whether certain business should be transacted or not, and therefore I felt justified in voting on that question, although I certainly should not have thought it right to interfere with the administration of the Society. For similar reasons I am exceedingly anxious that the business of the Society should be perfectly clear, and that we may know exactly in what position we stand. I would therefore ask you, sir, if you will be kind enough to tell us what view you take, and, if you have consulted other members of the Council, what view they may take upon the position. I think it is exceedingly immaterial what the decision arrived at was, because virtually I consider a practical issue has been obtained; that we know that whereas very naturally and properly, and as we should expect, there has been a considerable division of opinion in the Council upon this measure, that that quite reflected the feeling of the trade, and that there is an equal balance of opinion in the trade outside as to the course which it is expedient for the Society to adopt upon this question. The last thing I should desire to occur would be that by any inadvertance or oversight a result should be, as it were, caught, which might be unsatisfactory to others, and I think the best issue we could arrive at really would be that the question is still hung in suspense, and that we afford time for the ripening of opinion on this measure, which is of considerable importance, and that a mature and definite judgment should be more emphatically pronounced before any action is taken; at the same time I attach great importance to the order and form of public business, and I consider this most important that we should not have any decision of this Society recorded which is not strictly formal. Perhaps you will kindly tell us what course you have been advised to take in this measure, or if the facts are as they have been generally understood.

The President: You are aware that this question was put in a way that is not quite usual, and I must say that my inexperience as a chairman of public meetings did not quite make me familiar with the nature of a motion for the previous question. As I think you suggested just now, had it been simply a vote, yes or no, whether ladies shall become members, we should have all understood the voting better. As it is, in the evening, when talking over the measure, the idea struck me tha.

I had mistaken the figures handed in, and that I had mistaken them from the circumstance that 1 took the figures handed me by the teller on one side, namely, Mr. Vizer, as the figures on his own side, whereas he was really telling on the opposite side; and in the same way Mr. Wade, who told on the other side, and I am afraid I took his figures as representing the opinion which he was supporting. But I see Mr. Vizer is present, and I am very glad to have the opportunity of asking him whether he did hand me in the larger figure, 59, or whether he did not. I find that the original number I put down was 53, from the number of hands I counted, and then I got 59 down, and I think that was the figure Mr. Vizer gave me. In future, if ever again I have to superintend a meeting of that kind, I should certainly insist on the tellers handing in their report each of them in writing, which would save any such question arising. I see now that I committed an error in not insisting on that little formality. As it is, in the excitement of the moment I must have overlooked that each teller was telling on the opposite side, and the vote therefore appears to have been recorded as in favour of the amendment, that is, for the previous question. I must say, looking at the question from a broader point of view, I do not think it is of practically much importance, because we called upon the general meeting of the Society assembled from all parts of the country to assist the Council, which is the only executive in this Society, to come to a decision as to the propriety of admitting females to the membership of this Society or otherwise, and I think the question has been answered, and answered most emphatically in this way, that the Society is divided upon the question, and about equally divided; and whether the votes show a majority of one or two one way or the other would, I think, have little weight with the Council. The Council would not be bound by a small vote of one in a meeting which only includes some 120 members out of the 5000 we have. The Council has to exercise its judgment in all these cases, and of course its judgment is very much influenced by a vote, but that vote, if it is merely a turning vote one way or the other, still leaves the Council, I apprehend—for that is the view I shall take as a member of the Council—quite unbiassed, to act to the best of its judgment on this question. Under these circumstances, practically, the mistake or error, if it be one, and I will call on Mr. Vizer presently to inform us whether it is so or not, will not make any practical difference to the question. I think the question is one that has advanced very rapidly since five years ago, when I believe only three hands were held up in favour of ladies being admitted, until now we had half a room, within one at any rate, and one gentleman did tell me at the Conversazione that he had voted in the majority and intended to vote the other way, which would leave them equally balanced. Under these circumstances I should have felt it my duty to vote for the *status quo*—to leave things until there is a distinct majority. We must remember that those who oppose the principle of admitting ladies to the trade are men whose opinions deserve great weight, and we ought therefore to feel that in considering this question, until there is a decided opinion one way or the other, it would be wise for the Council, and I shall certainly so advise in my place at the Council, to let this question rest for a time. It is coming, I am quite convinced, but I think it would be hardly wise to take action on a mere bare majority one way or the other. I will now ask Mr. Vizer to tell us whether I am right in saying that an error was committed.

Mr. VIZER: I am sure we shall all quite accept the explanation of our worthy President that it was a pure accident on his part in the decision. I could not pledge my word as to what my figures were, but I gave them to the President in writing on a piece of paper.

The PRESIDENT: You showed me the figures, but did not hand that writing in to me.

Mr. VIZER: My only reason was that my opponent should not hear how many I had counted, and therefore I simply wrote on a piece of paper the number, and I believe it was fifty-nine. I think we shall all agree that the decision was so exceptionally close that we must leave it in the hands of the Council, and, I suppose as is usual in those cases where a chairman has to give a casting vote, he generally gives it in the direction not to alter things, but to leave them as they are rather than as they are not; therefore, probably the action of the Council will be to defer the question to the next meeting, when, perhaps, the division will be more decisive. I think that is everything I need say. I quite accept your explanation, that in the excitement of the moment order was not exactly kept. I, for my part, wrote to Mr. Wade, last night in reference to it. I was surprised at the mistake, and that brings me here this morning. Mr. Wade quite thinks with me, that of course we must leave it in the hands of the Council.

The PRESIDENT: I am advised by our solicitor that it cannot now be changed unless we have a special meeting summoned expressly for the purpose of considering the question again; that it is impossible to alter the decision at this adjourned meeting, because it will be necessary then to put the original motion to a vote, and it would obviously be very unfair to do so in a small and not representative meeting as this would be.

Mr. URWICK: I believe Mr. Wade has written a letter to Mr. Vizer, in which he speaks with no uncertain sound as to the number. Mr. Vizer does not quite recollect, and perhaps he will kindly read Mr. Wade's letter. I also believed myself that Mr. Wade had the highest number.

The PRESIDENT: I gave him the information myself. I hope you will all understand that I had no wish to misrepresent the state of the case, and as soon as I discovered I had made an error I communicated with Mr. Wade.

Mr. URWICK: As Mr. Vizer was not quite sure what the number was, I think if he would kindly read Mr. Wade's letter of explanation the meeting would be perfectly satisfied. He has addressed a letter to Mr. Hampson, but Mr. Hampson is not here. Of course we all feel there was an error, because the first decision was perfectly right as to the number, as far as I could see; but we, of course, accepted your decision in a candid and generous spirit, and considered that you were infallible, having had the figures so clearly placed before you. All that I want is that Mr. Wade's letter should be read.

Mr. VIZER accordingly read Mr. Wade's letter to him, stating that he should be unable to attend the meeting, but he would leave it in Mr. Hampson's hands to do whatever might be arranged, and suggesting that the matter should be left to the new Council to act upon the spirit of the meeting by adopting the real verdict, as it would be practically impossible to call a special meeting for the purpose.

The PRESIDENT: I think some little excuse is due to myself that the decision was not challenged by the tellers, because they must have known surely which side they were telling for.

Mr. VIZER: Pardon me, I may honestly say that until Mr. Wade met me last night I did not know his figures. I believe Mr. Wade was inclined to challenge the vote at the time, but there was a call of "No, No."

Mr. GILES: We have now full information on the matter, but we have arrived at no course of action. I think it is quite possible to take a course which would give perfect satisfaction to everybody. It is admitted that there was an error in the figures, and you cannot possibly, with a knowledge of the matter, record it as a part of the transactions of the meeting. I should propose that according to the custom adopted in the House of Commons you should correct the error by an entry in the Journal, and that you record the fact that the vote of the previous meeting was in favour of the discussion. I would then ask you, sir, at this meeting, to put the motion for the admission of ladies, that we should none of us vote either one way or the other; that you should give your casting vote for the *status quo*, and the meeting would be ended.

The President: That would perhaps be a proper way of settling this difficulty. It is evidently not right that a vote should go forth to the world which is incorrect and known to be incorrect.

Mr. Giles: I may say that in the meantime I have communicated with Mr. Palgrave, the assistant clerk to the House of Commons, and I have a very kind letter from him in which he has advised me, and expressed his readiness to discuss the question further with me if necessary. I am acting, therefore, under the very best advice.

Mr. Vizer: As far as I am concerned I am perfectly ready to adopt Mr. Giles's suggestion.

The President: I could not permit the meeting to take any effective action, it being so small.

The President then formally announced that there was an error in his decision respecting the previous vote, and that the numbers were, for Mr Vizer's amendment on the previous question 57, and against it 59, and therefore the amendment was lost. He then formally put the motion of Mr. Wade, and no one voting for it on either side he gave his casting vote against the motion.

Mr Greenish: If you will allow me, Mr. President, I will make a remark or two on the voting papers. I have on a former occasion directed your attention to the number of voting papers issued as compared with those returned, but it is a source of congratulation on the present occasion that we have had a much larger number than for several years past. In 1874, 1166 were returned; in 1875, 1077; in 1876, 1073; in 1877, 1464; and in 1878, 1870. But it is to be regretted that the number of papers disallowed as informal are rather increasing. It is also much to be regretted, now that so much interest is taken in the proceedings of the Council, that there is so much apathy on this matter that out of 3540 persons to whom papers are issued only about one-half should take the trouble to vote.

Mr. Wills said he was glad to have this opportunity of thanking those gentlemen who had voted for him, although he was not successful. He was proceeding to read some remarks with regard to the sending out of the voting papers and the mode of filling them up, but was called to order.

The Secretary stated that the voting papers were sent out with the greatest care, each one being checked by a second clerk. Of course he could not say whether all the papers reached their destination.

Mr. Giles then proposed a vote of thanks to the President. It was seconded by Mr. Vizer and carried unanimously.

The President said he felt he did not deserve their thanks.

A vote of thanks to the Scrutineers was carried and acknowledged by Mr. Hopkins on behalf of his colleagues and himself. He said that there were upwards of 1700 voting papers examined, and they were all scanned as closely as possible, so much so that if any one appeared a little different to the others it was brought under the notice of the whole body of Scrutineers and each paper was decided on its merits.

This terminated the proceedings.

Parliamentary and Law Proceedings.

The Pharmaceutical Society *v.* The London and Provincial Supply Association (Limited).

This case, which was an action for the recovery of a penalty for infringement of the 15th section of the Pharmacy Act, 1868, came on for hearing at the Bloomsbury County Court on Friday, May 10, before G. Lake Russell, Esq., the Judge. Mr. Flux appeared for the Pharmaceutical Society, and Mr. Sanders, instructed by Messrs. Crouch and Spencer, for the defendants.

Mr. Flux, in opening the case, said: In this case the defendants having retained the learned Recorder for Bath may perhaps excuse my opening the case at some greater length than is usual when these cases are before your Honour. I may, perhaps, at this point mention that I have received an intimation that this case may be thought to be distinguishable from former cases which have been before your Honour, on two grounds, one being that the defendant is an Incorporated Company and is not amenable to this law, or in other words that there is a *casus omissus* in the statute; and the other point is that assuming the defendants to be amenable to the law, the ground is covered by the circumstance that in one at least of the sales upon which the action is based a person was employed by the defendant company, which person happens to be a duly registered chemist and druggist. From the point of view represented by me neither of those propositions can distinguish the case, and I am entitled to recover the penalty particularized in the claim. Your Honour observes that there are four instances of sales of poisons, and that I have made them the basis of a claim for one penalty only. I have claimed only one penalty in deference to the suggestions which have come from the other side that they consider this question involves one of principle, and the Society which I have the honour to represent would desire in this and every other court to avoid any appearance whatever, of oppressively using those powers which the law has entrusted to them. The Act of Parliament is that of the 31 and 32 Vic. chap. 121, commonly called the Pharmacy Act, 1868, and I may just call attention to a few clauses. In the first place to the preamble as introducing the matter: "Whereas it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing or compounding of poisons, and persons known as chemists and druggists, should possess a competent practical knowledge of their business." Then in section 1, from and after the date there named, "it shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons," or to assume or use certain titles "unless such person shall be a pharmaceutical chemist or a chemist and druggist within the meaning of this Act, and be registered under this Act, and conform to such regulations as to the keeping, dispensing, and selling of such poisons as may from time to time be prescribed by the Pharmaceutical Society with the consent of the Privy Council." Then in clause 4 there are words which point to assistants in the conduct of business, which may have a bearing, and it provides that "any person, who at the time of the passing of this Act, shall be of full age, and shall produce to the Registrar on or before the 31st day of December, 1868, certificates according to schedule (E) to this Act, that he had been for a period of not less than three years actually engaged and employed in the dispensing and compounding of prescriptions as an assistant to a pharmaceutical chemist, or to a chemist and druggist, as defined by clause 3 of this Act, shall, on passing such a modified examination, etc.," "be registered as a chemist and druggist." Then section 15 is the one under which these penalties are claimed; from and after the date named, and which is now past, "any person who shall sell, or keep an open shop for the retailing, dispensing, or compounding poisons, or who shall take, use, or exhibit the name or title of chemist and druggist, or chemist or druggist, not being a duly registered pharmaceutical chemist or chemist and druggist, or who shall take, use, or exhibit, the name or title pharmaceutical chemist, pharmaceutist, or pharmacist, not being a pharmaceutical chemist, or shall fail to conform with any regulation as to the keeping or selling of poisons, made in pursuance of this Act, or who shall compound any medicines of the British Pharmacopœia, except according to the formularies of the said pharmacopœia, shall for every such offence," and I would point to the word "offence" as coming within certain words of certain other statutes, "be liable to pay a penalty or sum of five pounds, and the same may be sued for, recovered, and dealt with in the manner provided by the Pharmacy Act for the recovery of penalties under that Act." Then in section 16 there is provided an exception, which exception I refer to as establishing the rule, "Nothing hereinbefore contained shall extend to or interfere with the business of any legally qualified apothecary." Then you come in the fifth line to the exception, "and upon the decease of any pharmaceutical chemist or chemist and druggist actually in business at the time of his death, it shall be lawful for any executor, administrator, or trustee of the estate of such pharmaceutical chemist or chemist and druggist to continue such business if and so long only as such business shall be *bonâ fide* conducted by a duly qualified assistant." That which I submit to your Honour is, that this is really the only case in which a duly registered person can be the means by which persons not duly registered can carry on this business. Then in section 17 there are provisions under which, in a police court, Mr. Mackness, whose name will appear during these proceedings, and this company which is defendant, have in respect of two of these matters specified in the particulars, been the subject of proceedings under this 17th section, which indicates certain penalties where sales take place of poisons improperly labelled and without certain conditions. That clause has on a former occasion been urged upon your Honour's attention, and on a former occasion a defendant has urged that he has previously in respect of the same matter been the subject of a proceeding in the police court; but your Honour having considered the subject determined, and I have an informal report of the case, that the police proceedings and the penalty therein recovered were quite separate and apart from the penalty under the 15th section for which I am suing to-day. Then the 26th section has an indirect bearing on the matter, because it shows that there is vested in the Privy Council a power of control over the duly registered persons, which of course cannot be exercised if it be possible that an assistant can by force of being employed as a servant confer a qualification on the person who chooses to pay his salary. "The Privy Council may direct the name of any person who is convicted of any offence against this Act which, in their opinion, renders him unfit to be on the register under this Act, to be erased from such register, and it shall be the duty of the Registrar to erase the same accordingly." Then there are schedules which go to show that assistants were distinctly in the contemplation of the Act of Parliament, but that as assistants they were in their proper place, that is to say, as assisting duly qualified persons and not as conferring a qualification. Now, referring again to section 17, you will find that the penalties under that clause are to be recovered in the manner provided by the Pharmacy Act; and that leads me to refer you to the Pharmacy Act which was passed in 1852, the 15 and 16 Vic. chap. 56. That goes to show that on this side of the border I am to sue by plaint in the County Court, and in Scotland I sue before the Court of Sessions in the ordinary form, or by summary action before the Sheriff of the County. That, so far as the law is concerned, shows that what I have to establish as concerning this company is that it is not above the law; in other words, that this association of persons is not in any more favoured position than an individual. It is only a firm, a partnership, and under the law of this realm this company may be sued. So far as interpretation statutes are concerned there are two, one is 7 and 8 George IV., cap. 28, and the other statute I may name at the same time is the 13 Vic., cap. 21. The earlier of the two statutes contains a clause, 14, to this effect, "And be it enacted that wherever this or any other statute relating to any offence, whether punishable upon indictment or summary conviction, in describing or referring to the offence or the subject matter on or with respect to which it shall be committed, or the offender or the party affected or intended to be affected by the offence, hath used or shall use words importing the singular number or the masculine gender only, yet the statute shall be understood to include several matters as well as one matter, and several persons as well as one person, and females as well as males, and bodies corporate as well as individuals, unless it be otherwise specially provided." Concerning that, I submit that it covers the ground, and that the words, "whether punishable by indictment or summary conviction," are not of the essence of the enactment, but that it will run for all practicable purposes thus, wherever this or any other statute relating to any offence, in describing or referring to the offence or subject matter, and so on. But if your Honour should not be with me on that, then I submit that the suing which is authorized by the Pharmacy Act, in other words that the judgment which your Honour is asked to give, will be a summary conviction within the meaning of this statute. Now, sir, there have been many cases before the courts in which it has been held that companies are not above the law, even by the common law apart from this statute. I do not find that in any case this statute has been relied upon in an action against a company for penalties, and I do find very many cases where the courts have in actions of this kind given judgment against the defendant. I may mention in passing the Brighton Aquarium case, which has been before the public, and is probably in your Honour's mind, but I will deal with these cases more in detail if the argument should extend so far. These cases have put the law concerning these penal actions in civil courts against companies on the footing which I have ventured to submit, and which, I think, can be substantiated. The statute of the 13th Vic. contains in clause 4 this sentence. The statute is a statute for shortening the language used in Acts of Parliament; it is generally called Lord Brougham's Act, and I believe it is generally considered to have accomplished the shortening intended in all cases. The word companies is not mentioned in the clause, but though I cannot invoke the clause as enacting that for which I am contending, I think that I may base upon the absence of the word an argument that Parliament, in framing and passing this statute, recognized the state of the law that companies were included by and subjected to all the penalties which were indicated by statutes against the person. I am in your Honour's hands whether at this stage I should furnish you with all these cases, but Terry *v.* The Brighton Aquarium Company is reported in 10 *Law Reports*, Queen's Bench, page 306.

The Judge: What is the statute of the 13 Victoria?

Mr. Flux: Cap. 21.

Mr. Sanders: It only goes to this, that the singular shall include the plural.

Mr. Flux: The word Company does not appear there, but it enacts that the singular shall include the plural, and surely a company is nothing more than a plurality of persons. I have the Brighton case here, and in the note your Honour will find the Act of Parliament on which the action is brought, and at the foot of page 307 the words of the Act which were material, and which are as nearly as possible parallel with mine, will be found "the keeper of such house, room, or place shall forfeit the sum of £200 for every day that such house, room, or place shall be open or used as aforesaid on the Lord's day." Now the words of my statute are "who shall keep open shop." Where the language is not precisely the same it would be difficult to find language more closely corresponding; and then the further words of the statute give to any person who chooses to be the informer, the right to sue for that penalty in a civil action. In this case the penalty was sued for in a civil action, and judgment was given for the plaintiff. The defendant was represented by the learned Solicitor-General and Mr. Bosanquet, and no argument was raised to the purport that because the offence was committed by a company, the company was not a keeper within the meaning of the statute, such as is suggested here. In that case, so far as I am able to form an opinion, there is distinctly an authority in favour of my proposition. On three distinct occasions the Brighton Aquarium Company's case has been before the Courts, and in neither instance can I obtain a trace of this point having been raised. Warner *v.* The Brighton Aquarium Company is in 10 *Law Reports*, Excheq. 291. There the learned counsel engaged were Sir John Holker, Mr. Manisty and Mr. MacMillan, but this point was not raised; and I refer to the newspaper report of another case of Girdleston *v.* Brighton Aquarium Company, which was before the Court of Exchequer *in banco*, within the last month, but it was decided so recently that it has not yet appeared in the authorized reports. It is in the *Times* newspaper of the 5th March this year and again May 2nd. Then there is a case of Green *v.* The London General Omnibus Company (Lim.), in 29 *Law Journal*, New Series, Common Pleas, page 13. The head note is this, "In an action against a corporation (who were incorporated for the purpose of driving omnibuses) for interfering with the plaintiff's business of a carrier of passengers, by driving the omnibuses of the corporation in such a manner as to molest him in the use of the highway, the declaration set out various acts of such interference, which were all connected with the driving of such omnibuses, and were alleged to have been wrongfully and maliciously committed by the corporation:—Held, on demurrer to the declaration, that the action would lie against the corporation, although the acts complained of were done wilfully, since they were done within the purposes of the incorporation, and in such a manner as to constitute an actionable wrong, if done by an individual." Here is an actionable wrong done by the individual. At page 17 I have marked a passage in the judgment of Lord Chief Justice Erle. It runs "and the ground of the demurrer relied upon for the defendants is, that the charge is a charge of a wilful and intentional wrong, and that a corporation cannot be guilty of such a wrong, and therefore that the action does not lie. But I should state that the whole of the acts that are charged against the defendants are acts connected with the driving of their vehicles; and this is a company incorporated for the purpose of driving omnibuses, and therefore, the actual things done by the defendants are acts within the purpose of their incorporation. Unless they had been wrongfully done, of course there could be no ground of complaint; but being wrongfully done, we think clearly the action lies, and that there are abundant authorities to show that under those circumstances the action will lie. I take the whole tenour of authorities, from Yarborough *v.* The Bank of England down to the case of Whitfield *v.* The South Eastern Railway Company, to show that an action for a wrong does lie against a corporation, where the thing done is within the purpose of the incorporation, and that it has been done in such a manner as to constitute what would be an actionable wrong if done by a private individual." Then I will not trouble your Honour with anything until we come to the 7th line on page 17: "And I may add, as an additional reason for our decision, the inconvenience to the public that would arise if we were to hold that these companies, incorporated for the purpose of trade, had a restricted limitation put upon their liability by reason of such incorporation, and were exempt from responsibility because they intentionally wronged the public." There are other cases which I might bring to your Honour's attention, but if my learned friend will concede to me the liberty that I may if needful rely upon those cases, I, having opened the view shortly which I have the honour to submit to your Honour, I will not now trouble you with a number of cases which industry and examination have placed at my disposal. Then concerning this particular case. That which I would mention and am able to prove is this, that in the month of December last the attention of my clients was called to No. 113, Tottenham Court Road, where a large business was being conducted under the style of being a co-operative store. It was called the "London and Provincial Supply Association." The word "Limited" was no part of it. It was ascertained that the sole proprietor of the business was one William Mackness, an unqualified person, and a purchase of poison was made, which was labelled "London and Provincial Supply Association. E. H. Longmore, Chemist." Upon that I committed that which the police magistate has described as an error of practice. Of course if I commit an error in practice I shall be glad to be set right, but the impression on my mind is that in a civil court I should be regarded as committing an error of practice if I pursued the converse course; that is to say instead of coming to this court and issuing a plaint and exposing the defendant to the costs of the plaint, I pursued the ordinary courtesy of a solicitor's office, and sent a letter before action. On that letter before action Mr. Mackness, who was thus addressed, did, by his solicitors, Messrs. Crouch and Company, communicate with me and forward a cheque for the penalty which was pointed to. That letter I will bring to your Honour's attention, and the letters which passed between my friend and me.

Mr. Sanders objected to any matters being gone into not bearing on the alleged offence as it would only lead to interminable false issues.

Mr. Flux: I trust your Honour will have some confidence in me that I will not press you with matters which do not appear relevant. I will not waste the time of this or any other court if I can possibly help it. When the penalty was sent to me there came a letter asking indulgence until proper arrangements could be "completed," and I laid by. Presently I found that the arrangements were the incorporation of the company, and the continuation of precisely the same business without any change whatever, externally or otherwise, excepting the addition of the word "Limited" as part of the title. I then came to ascertain the constitution of that company, and I will not apply the word to it which naturally rises to my lips, but I will ask your Honour to look at it. Mr. William Mackness takes to himself three other gentlemen named Mackness, I believe his father and two brothers, a clerk of his solicitors, Mr. Longmore and two other persons, who are in his employ, and whilst the law will allow twenty persons to carry on a private partnership these seven incorporate themselves as an incorporated company, and they set up the Joint Stock Companies Act which empowers persons to incorporate themselves as companies for any lawful purpose—not for any unlawful purpose; they take advantage of that Act of Parliament and they say because we have thus classed ourselves together and registered a something at Somerset House and got a thing sealed we can set the law at defiance. Now the Articles of Association of that company provide for the appointment of a managing director and at the first meeting of the so-called board, which consists of two Macknesses and somebody else, Mr. William Mackness is appointed managing director. The articles confer upon the directors the right of preemption of every share, and when I come to look to the manner in which the capital of the company is held, without going into the question as to whether any of these gentlemen do or do not hold their shares in trust for Mr. William Mackness, I find that he holds 564 shares with £10 paid, or a total capital of £5640, and that the rest of the shareholders put together hold a capital of £82 10*s.* That is the company which comes here and asks your Honour to hold that they are above the law.

Mr. Sanders: I do not say that we are above the law.

Mr. Flux: Outside the law then.

Mr. Sanders: If my learned friend will give your Honour the facts we should get on better. He has been about an hour and he does not seem to have half finished his opening yet.

Mr. Flux: About the facts, I shall give your Honour the usual evidence, but in the proceedings before the police magistrates, Mr. Longmore, being examined as a witness, admitted——

Mr. Sanders again protested against any matters being gone into not specified in the summons.

Mr. Flux: Then under those circumstances I will put aside the admission and will prove that Longmore, when he effected these sales, whether he was or was not the registered holder of £7 10*s.* of paid up capital, was a hired servant, nothing more or less, and subject to dismissal. The point which I submit to your Honour is this, that this Act of Parliament, passed for the protection of Her Majesty's subjects, contemplated that the business of a seller of poisons, should be conducted only by a person possessing every skill, the skill to be excercised as a master, and not as a servant, that the law contemplated that a master having a qualification may delegate to his servant certain acts and certain powers, but that by the hiring of a qualified assistant, an unqualified person could not acquire this status which the Act of Parliament said, was necessary for the protection of Her Majesty's subjects. I will now prove the various acts of sale.

Mr. Joseph Brooker Ward sworn, examined by Mr. Flux, said:—

I am a clerk of Messrs. Flux and Co., the plaintiff's solicitors. On the 4th of Feburary last, I went to 113, Tottenham Court Road, which had the appearance of a large general shop. There were posters outside which described the shop as being The London and Provincial Supply Association, Limited. On the left-hand side of the door there was a part of the shop fitted up as a chemist's shop. I went to that counter and addressed a person, whom I now know to be Mr. Longmore, and asked for a small quantity of red precipitate. It was supplied to me, and I paid 2*d.* for it. I produce the packet. It has been in my possession from that time until the 1st March, when I handed it to Professor Attfield, of the Pharmaceutical Society, for the purpose of making an analysis. I received it back from him at the Marlborough Street Police Court, and it has been in my possession ever since. On the 20th February, I attended at the same shop. I went to the same counter, but I did not see the same person on that occasion. I asked for a small quantity of oxalic acid. It was supplied to me by a person whom I have not seen since, and had not seen before. I said, I want a small quantity of oxalic acid. He asked me how much I wanted. I said a small quantity. He asked me if two pennyworth would be sufficient. I said "yes," and he supplied me with this packet for which I paid him twopence. I handed the packet to Professor Attfield, and received it back from him on the same day as the other. After I made that purchase I spoke to a gentleman who was walking about the shop and told him I wanted to see the register of shareholders of the company. He said he did not think they had one. I asked who was the secretary or where the secretary was. He said the secretary was out. We had some conversation and I told him they ought to have a register for inspection by the public. Eventually he told me that he was the secretary, and that Mr. Mackness, who had the general management of the affair, was out, but would be in shortly. I said I would come back and see him, which I did. I saw the secretary again and Mr Mackness in the counting-house of the company. Mr. Mackness told me they had no regular register, as his solicitor had not had time to get the whole thing in order, but they showed me a rough list of shareholders on a half sheet of foolscap. I inspected that, and asked if there were any more. Mr. Mackness said not at present, but we have applications from our three managers, or something to that purport, and he showed me three forms of application for shares from Mr. Longmore, Mr. Polley the secretary, and another man. He told me if I would come up again in a day or two he would communicate with the solicitor, and no doubt he would have all the things in order. I had a conversation with Mr. Mackness, and I took the oxalic acid out of my pocket, and told him he was infringing the law by selling it. He sent for Longmore and talked to him about it. I had made a purchase at the same shop before.

Mr. Sanders objected to any matter being gone into before the date of the offence charged.

Mr. Flux submitted that the memorandum of association would show that the object of the company was to purchase Mr. Mackness's business, and therefore he contended it was relevant to show that Mr. Mackness's business comprised the selling of poisons.

The Judge: You had better not hamper your case with such dangerous matter.

Examination continued.

I know the handwriting of Mr. Crouch, the solicitor for the defendant. I produce various letters from him to the plaintiff's solicitor.

Mr. Flux called for his original letters to the defendant's solicitors.

Mr. Sanders produced the letters, but objected to any of these letters being used, as not being evidence; some discussion ensued, the result of which was that Mr. Sanders admitted the letters to be genuine, but denied their being evidence in the present case.

The learned Judge said that *prima facie* they would not be evidence. Mr. Flux had better call for a particular letter and raise the question upon that.

Mr. Flux: Take the letter of the 30th January, which contains these words, "we enclose cheque"—

Mr. Sanders: That will not do; this has no relevance to this inquiry.

The Judge I will read it *de bene esse.*

The learned Judge having read the letter, said: I do not see how this can bear on the matter.

Mr. Flux, to the witness: Have you any knowledge as to whether a penalty was paid?

Mr. Sanders objected.

The Judge: I admitted the objection that it was not evidence.

Cross-examined by Mr. Sanders.

I did not want the articles I purchased for my own use. I did not pay for them out of my own money.

In other shops it would have cost a shilling what you paid twopence for?—I cannot say; I am not in the trade.

You did not think it necessary to go anywhere else to buy anything of the sort?—I did not see the necessity.

You bought it for the purpose of making up a case?—Certainly. I know Mr. Longmore. I did not then. He is a registered chemist and druggist. I knew that before.

Re-examined.—I want to ask you whether that oxalic acid is or is not labelled in accordance with the requirements of the act?

Mr. Sanders objected that that was a question under section 17, not under the one under which they were summoned.

Mr. Flux: That oxalic acid was sold as if it was so much sweets.

Mr. Sanders: I object to this. The magistrate had that before him, and adjudicated upon it.

Mr. Hugh Joseph Stalker, said: I am a clerk to the plaintiff's solicitors. On the 19th March, I was told to go and went to 113, Tottenham Court Road, and I presented a prescription at the chemist's counter. I saw a gentleman whom I now know to be Mr. Longmore, and asked him how much it would cost to dispense it. He said 8*d.*, so I left the prescription with him to make up. He told me to call back in an hour or so's time. I went back in about two hours' time, and I asked an assistant who was there for a prescription for Mr. Stalker. He handed me a bottle, with the prescription tied round it, for which I paid 9*d.* I kept it in my possession until the 7th May, and then I handed it to Professor Attfield. On the 20th March, also pursuant to orders, I went again to the same address. I saw Mr. Longmore and also two assistants. Mr. Longmore was busy, so I spoke to one of the assistants, and asked for a pennyworth of white precipitate.

He asked me what I wanted it for. I told him it was for ointment for the head. He made it up into a little packet and gave it to me, and I paid a penny. I kept that until the 7th May, when I took it and the medicine to Professor Attfield of the Pharmaceutical Society.

Cross-examined.—You did not go to make a *bonâ fide* purchase, but to make out a case, did you not?—Yes.

You did not want it for your head, you wanted it to make evidence of?—Yes.

You did not tell him that did you?—No.

You told him a story when you said you wanted it for your head?—Yes.

Was that out of your own head or out of Mr. Flux's head. Did he tell you to say that?—No.

You did not lay out much money, only twopence in all?—Tenpence.

You got what in any other shop would be a shilling's-worth for a penny?—I do not think it would be so much as that.

Tenpence at all events?—I do not know.

The Judge: You do not know whether it would be cheaper than elsewhere.

Professor Attfield was then called, and Mr. Sanders stated that if this witness were only to prove that the articles were poisonous he would admit that.

Mr. Flux said he would not take any admissions, and it would be more regular to have the case proved. It had been said that in a penal action no admission could be taken.

Professor Attfield examined, said: I identify as poisons the various articles deposed to by the previous witnesses.

Now look at the prescription which is produced, is there any poisonous ingredient there?—Yes; the prescription mentions solution of perchloride of mercury, that is a poison. The directions are to take two teaspoonfuls three times a day. I have examined the contents of the bottle, and find in them perchloride of mercury. The directions are wrong, and the mixture is very dirty, otherwise it is in accordance with the prescription. The direction on the prescription is to take two teaspoonfuls three times a day, but the directions on the bottle are to take two teaspoonfuls twice a day.

Mr. Sanders: All the better for the patient.

Witness: It is not good for patients that there should be any error on the part of the dispenser. The other packet contains white precipitate of mercury. Perchloride of mercury is another expression for corrosive sublimate.

Cross-examined by Mr. Sanders.

I have heard the evidence of Mr. Ward and Mr. Stalker, as to the prices they mentioned as having been given. I do not know that they are much below the ordinary prices of a chemist's shop. This prescription could be made up for prices varying from eightpence to a shilling. Not more. I do not know anything about this case beyond what I have heard from being in court this morning, and being at the Marlborough Street Police Court.

Mr. Edward Henry Longmore, examined by Mr. Flux: Are you a registered chemist and druggist?—Yes.

Do you reside at No. 10 Storey's Gate, St. James's Park?—I have lived there. It is not my address now. It was on the last occasion.

Give the Judge your address, that we may know where to find you.

Mr. Sanders objected to the question.

Mr. Flux said it was usual for a witness to give his address.

Where are you living?—38, Harrington Street, Harrington Square.

What is your employment?—Chemist and druggist at 113, Tottenham Court Road.

How long have you been at that place?—Since the beginning of October last.

Are you the proprietor of the shop?—Part proprietor.

What part?—The drug department.

What is the part of which you are the proprietor?—Five £10 shares.

Two pounds ten paid?—It is £12 10*s*. paid.

Two pounds ten each, or a total of £12 10*s*.?—Yes.

Who are your co-partners?—I think you have them there.

Your co-partners are your co-shareholders in the registered company?—Quite so.

(Handing a document to the witness.) Does that relate to the company in which you are a shareholder? I have a letter from my friend in which he says he will admit that is a true copy of the Memorandum and Articles of Association of the Company.—Witness: That is not the company; my name does not appear.

Mr. Sanders: That is the company, although your name does not appear.

The witness: I see the names of the directors are there. I am well aquainted with all those names. That is the company.

Mr. Flux: Were you a shareholder before the 19th February last?—I was.

At what date did you become a shareholder?—I can scarcely tell you. My memory does not recall to me the date.

Do you receive a salary?—Yes.

Tell us the amount of it?—Am I obliged to answer that question.

The Judge: Yes, you are.

Witness: Two pounds six shillings and twopence per week.

Mr. Flux: Who engaged you?—Mr. Willian Mackness.

Are you engaged by the week or by the year or hour?—I have no definite engagement.

You have no definite engagement as to it?—No.

Who could dismiss you?—That is a question I could not answer. I do not know. There are three or four who could dismiss me.

To whom do the moneys received for sales of poisons go?—To the cash-desk.

Who keeps the cash-desk?—There is a man appointed especially to keep the cash-desk and give in such bills as are taken during the day.

Who manages?—For which department?

The poisons?—I do.

Do you pay for them out of your own pocket?—Not likely.

Who does pay for them?—The association.

And the company—the association—receives the money from the cashier?—Yes, quite so.

Did you pay the £12 10*s*. for your shares?—I did.

Was it handed to you for that purpose?—Certainly not.

Do you hold them for your own sole interest?—Certainly.

Not subject to any agreement for sale?—Certainly not.

Other people besides yourself serve at the chemist's counter, do they not?—Qualified assistants.

Who engages them?—I do.

What are their names?—William Betts, a modified assistant, and Walter Owen, a registered chemist and druggist. They are both registered chemists and druggists. One is by passing the minor examination the other by the modified examination.

Who pays their salaries?—I do.

Out of your own pocket?—No, for the company.

In other words the company sends you the money with which they are paid?—Just so.

Cross-examined by Mr. Sanders: I do not think my learned friend has made much of you, and I do not think I have much to say. You are a member of the Pharmaceutical Society are you not?—I am a registered chemist and druggist by examination under the Pharmacy Act.

Perfectly qualified to dispense?—Duly qualified to carry on business for myself.

Do you attend regularly personally to this chemist's department at these stores?—Yes, always.

To that and nothing else?—To nothing else. I may mention that the Pharmaceutical Society's clerk has always taken the opportunity of coming when I was absent to my dinner.

I do not want to hear about that. You have two qualified assistants under you?—I have.

So that the public are perfectly protected?—Quite so.

You never make any mistakes I suppose?—Seldom or ever. Mistakes will occur with the best regulated firms, but they are very few and far between with us.

But as far as acquired science will enable you, you do conduct your business free from mistakes?—Certainly.

I need hardly ask you, the chemicals you sell are very much under the ordinary prices, are they not?—Yes, 25, 30 and 35 per cent. The prescriptions sometimes cent. per cent. less.

Arthur Ralph Polley sworn, examined by Mr. Flux, said:—

I am not now the secretary of the company.

The Judge: When did you cease to act as secretary?—In February last. When it was made into a company. Before February 4, I had ceased to be secretary.

By Mr. Flux: I am now manager. I became manager on February 4, when the company started. I am manager under the company and over the assistants. I engage and dismiss some of them. I have nothing to do with Mr. Longmore. The secretary is a gentleman named Cannon. I have been subpœnaed to produce the register of shareholders, and I produce it.

Mr. Flux: Look at that register and see on what date the witness Longmore became a shareholder?—I cannot tell you.

Mr. Flux: It is registered on February 19.

The Judge: Is that so; are you able to say that?—Yes, February 19.

Mr. Flux: Does it appear by that register, and is it within your knowledge, that Mr. William Mackness holds 564 shares credited as £10 paid?—Yes.

There are nine other shareholders only?—Ten altogether.

And the remaining nine hold between them only thirty-three shares?—Yes.

Each credited with £2 10*s.*?—Yes.

A total of £82 10*s.* against £5640?—Yes. I produce the minute-book of the company.

Mr. Sanders objected to the minute-book being examined as not bearing on the case.

Mr. Flux submitted that it was material to him to show that Mr. William Mackness was the managing director. He did not care for the exact date except for the purpose of showing that at the first meeting of the Board Mr. Mackness was appointed managing director.

Mr. Flux: I should like the date and the fact of the appointment. It may be well to see what directors were present and made that appointment. Whether in fact, Mr. William Mackness went through the form of requesting other people to appoint him.

Mr. Crouch: It is on February 18.

Mr. Flux: What directors were present?

The Judge: Supposing you say it is a company, which practically is Mr. Mackness, what then?

Mr. Flux: I submit that so far as this company deals in poisons, at any rate, that if it is formed for the purpose, it is not a lawful company.

The Judge: Would it be an unlawful company because out of ten shareholders nine hold one share each and the other holds the remainder.

Mr. Flux: Not by reason of the proportion certainly.

The Judge: Would not the course be to have the register cancelled? But so long as the register stands does not the Act of Parliament make the registration sufficient?

Mr. Flux: *Primâ facie* the register stands, but the company or the persons composing it are not protected from the consequences of their acts. I think I could show that, on the ruling of Lord Hatherley, in the case of Betts *v.* De Vitre, where the court held that the directors were responsible.

The Judge: Did he hold that it was no company.

Mr. Flux: I do not think he went that length.

The Judge: Besides you are suing the company. If there is no company, why do you sue it? The defendant here is the London and Provincial Supply Association, Limited.

Mr. Flux: According to the law as it now stands, I can sue any company or partnership by the name, style, or title by which they carry on their business.

The Judge: You are blowing hot and cold. You are suing them by that name and then say that they have no existence—that this is a fraud.

Mr. Flux: I sue them by that name and I venture to submit this to you that if they are a company they are responsible as a company, and if they are not a lawful company then they are responsible as individuals, and I am entitled to a verdict against them as individuals by their generic name.

The Judge: You cannot say when he became the managing director?

Mr. Crouch: Yes, sir, on February 19.

Mr. Sanders: I do not trouble you, Mr. Polley, with any questions.

Mr. Sanders: My learned friend has put before your Honour this case, and I think you must have arrived by this time at the conclusion that this is a case of much ado about nothing. I do not know what they complain of. If they are here in the interest of the public, the public has not suffered and the public cannot suffer, because every protection that the legislature says they should have the public have got. Why! in the association there is a perfectly qualified gentleman always in attendance, and who on every occasion of these sales was present superintending the sales. Not only that, but he has two duly qualified men under him, so that in point of fact no evil can arise out of this sort of trade. Whatever my friend, on the part of the Pharmaceutical Society has to complain of, I really do not know. If they had found here some unqualified man dispensing these poisons that would be another thing, but they themselves produced before you the very gentleman, a perfectly highly qualified man who is always present, he says, and managing this department. It is not left to anybody else, he says "I am always there." And what is the evidence before you, that on every sale of which they now complain Mr. Longmore, the qualified man was present. What is there to complain of? This is no doubt a most important question, because it not only affects this association, but it affects others, and your Honour knows there are some associations here in which the shareholders are probably numbered by thousands. I think the Civil Service Association, to which I have the honour, I will not say the honour, but the advantage, of belonging, number more than five thousand shareholders. Does my friend contend that all these five thousand shareholders must be members of the Pharmaceutical Society before they can venture to sell chemicals containing poisons. That is the contention. What does he say? He says the manager and the other shareholders with the exception of Mr. Longmore are not pharmaceutical chemists, and therefore they have no right to sell poisons. How are they to be pharmaceutical chemists. Many of these shareholders of course are females, and you cannot have a female pharmaceutical chemist? Are all the shareholders of these great associations to become pharmaceutical chemists before they can venture to sell anything containing poison? All they can do is this, to put amongst the number a qualified man. It does not matter whether a shareholder or not, but by putting a qualified man to dispense these poisons, they do all that can be expected and all that they really can do. Now, if my friend in his candour will tell me what we are to do to get out of the difficulty he says we are in, we will do it. What are we to do, Mr. Flux? Can you tell me what we are to do? He says, "Do not sell poisons at all." But why are chemicals, of course including poisons, to be excluded from the things these stores are to sell? I do not know why. If there is any advantage, and the public seem to recognise the advantage of these associations, why is not that advantage also to include the sale of chemicals, which we all require at certain times. But according to my friend's argument that branch of business never can be a portion of these co-operative stores' sales, because you never can have, according to his argument, a properly qualified body to sell. We have here one individual shareholder, a person who has under him other qualified men. My friend says that will not do. What will do? According to his notion I suppose they must all be members of the Pharmaceutical Society. What! all the members of the body composing this association? The thing is morally impossible and the legislature would never go so far as that. This act of course is a most beneficial Act, and it ought to be construed as strictly as the circumstances will admit, but you must not expect impossibilities to be accomplished, and my friend is asking for an impossibility. What the Act of Parliament intended was that the public should have some protection against unqualified and ignorant people dispensing dangerous substances; that was the object of it; and in order to do that, it says those dangerous things shall not be dispensed by people who do not know the difference between epsom salts and arsenic. You know the joke in Pickwick about the juryman who was a chemist, who said I want to be away. I have only a small apprentice-boy and he does not know the difference between arsenic and epsom salts. He was obliged to go into the jury box, and he says I am not responsible for the poisoning that goes on. That is the danger the legislature intended to guard against, that these dangerous things should be sold by people who are not qualified to understand their nature and to caution the people to whom they sell them. As regards the sale of poisons there are very stringent regulations, and you will see that when poisons are sold then there must be a label with the name of the party, and under some circumstances there must be an inquiry as to whom the party is to whom it is sold, and the party must be introduced by a person known to the chemist, and all must be entered in a book. All that is under the 17th section; but we are not dealing with that section now. The section we are dealing with now is the 15th, which I will call your Honour's attention to, because I wish to make some remarks upon it. (The learned counsel having read the section continued): We have not violated that. It says "any person," that is the person who sells; Mr. Longmore is one of the shareholders. He has sold and he is a duly qualified pharmaceutical chemist, or chemist and druggist. He says he is a chemist and druggist. Then how have we violated this section? I cannot understand. "Any person who shall sell." If Mr. Longmore, not being a person with this qualification, had sold he would have been within the terms of the section. But he comes under the designation, and in selling these things is duly qualified. Then it is said that you are only one of a greater number; there is a Mr. Mackness, who is managing director, and he is not a qualified chemist. I admit that, but you cannot expect to have the whole society pharmaceutical chemists, the thing would be an absurdity; you would require to have in some cases four or five thousand people to be pharmaceutical chemists before they could be allowed to serve these things in these great stores. No doubt Mr. Mackness is managing director. In these large establishments you must have some head, but that does not make him the man who sells. He is a shareholder amongst the other people, and delegated to him there is the duty of general management. It has been endeavoured to be shown to your Honour that Mr. Longmore is not that which he says he is, and that he is merely a servant. Well, to some extent he is; that is to say, he has a salary, but that does not in any way derogate from his position as a qualified man. Take all our railways. Who is a shareholder? Who are your directors? Paid men. Every director and every chairman certainly of every railway is a paid man. He receives a salary, but he is also a member of the association. I do not wish at this late period of the day to detain your Honour. My friend opened this case at great length, and spoke more than an hour, I think, and if I have your Honour with me I do not want to delay you further. It does seem to me we have done everything we could and everything the law requires. We have a qualified man to superintend the dispensing of these drugs, and he himself is a member of the copartnership. It is said that as regards the 4th February he was not a member of the partnership. Perhaps not at that time, but still he was a qualified man, and that is all the law requires. It must be a man qualified by the law, and he is qualified by the law, and it does not follow that because he is associated with other persons who do not have that qualification, that therefore that sale is within the section at all. You see by the preamble, which my friend read, what was the purport of the Act of Parliament—to protect persons from being served by persons who are incompetent to judge of the things they are selling; that is the Act of Parliament. How do we carry out this object. By putting over the dispensing, and giving the sole control of that department to a gentleman who is perfectly qualified, and who has under him perfectly qualified men also. They have not shown a single person connected with this establishment in the dispensing line who is not qualified. Is your Honour, therefore, to say that this establishment is conducted contrary to law? If you do you will have to apply the same rule to all the other great supply associations. The Army and Navy, the Civil Service, and all the rest. Your Honour's judgment will be then that every member of these large associations, four or five thousand in many cases, I know it is in the Civil Service, must all be members of the Pharmaceutical Society or they cannot venture to sell chemicals. It comes to that. I do not think your Honour will go so far, and I really think I should be unduly occupying your Honour's time by addressing any further observations to you.

Mr. Flux was about to address the Court in reply, but Mr. Sanders contended that as he had called no witnesses his friend had no right to address the Court a second time.

The Judge: Should you say that in Savory and Moore's and Messrs. Bell and Co.'s there can be no unqualified partner?

Mr. Flux: Certainly; just in the same way as I should say there can be no unqualified partner in a firm of solicitors. The law has imposed a personal qualification just as much as the revenue laws say that persons who are licensed shall do certain things. No one ever heard that one man, holding a license, could thereby license a multitude to employ him, and I submit, also, that as the law of master and servant applies that is fatal to the defence.

Mr. Sanders again objected to Mr. Flux being heard further.

The learned Judge said: I must adhere to the established practice.

Mr. Flux said there were some other cases he should like to call to his Honour's attention.

The learned Judge said Mr. Flux might write down the names of the cases, and hand them to him, and he would look at them, and he would give judgment that day fortnight.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Robinson, Broomfield, Bostock, Ivatt, Williams, Edward, Ball, Squire, Asselin, Martin, Glover, Jackson, Rayson, Laverack, Hadfield, Cardwell, Smith, Stevens, Taylor, Gibbons, Tucker, Abraham, Syrupus, Arsenicum, An Associate, Occidens, Sligo, Experientia docet, F. W. B., A. P. S., G. H. B., J. W. L., A. J. S.

"THE MONTH."

The suburban streets of London are now dressed in their very best. Unpromising as the weather appeared to be at the commencement of the month, the soft warm showers have brought out the flowers with a rapidity almost as magical as that of an arctic summer. The refreshing green tint of the young foliage is now at its brightest and contrasts delightfully with the pretty pink of the hawthorn, the golden tint of the laburnum, and the handsome white blossoms of the horse chestnut. Botanists and naturalists feel as if they had received a new lease of life, and perceiving that their harvest-time has come, begin to set to work in earnest to gather in their treasures. Most appropriately the lectures on botany commence early this month, for from May to August there is an abundance of material for study, and dry as botanical details may be to read, they wear quite another aspect when flowers can be handled and their wonderful fitness for the purposes for which they were designed is gradually unfolded to the thoughtful mind of the careful investigator.

The list of medicinal plants for the month must of necessity be a long one, although comprising few that have not been already noticed.

At the Botanical Gardens at Regent's Park, for the first time during several years, *Rheum palmatum* has blossomed freely, and young fruit is beginning to set, so that it may be hoped this comparatively rare species will be grown more abundantly hereafter. Of all the numerous species grown in botanical gardens this seems the smallest and most delicate. But few leaves are generally formed and these do not attain any great size. The main root is said to be liable to rot. This plant is also in flower in the Botanic Gardens at Edinburgh. The flowering appears to be rare, since the authors of 'Medicinal Plants' state that they were unable to procure a living flowering specimen. The inflorescence of the plant at Regent's Park is more spreading than the figure in that work, but possibly it becomes denser and more erect as the fruit ripens, as appears to be the case with *Rheum Rhaponticum*.

Arctostaphylos Uva-ursi is also in blossom. The waxy looking white corolla is prettily tinted with pink, and were the flowers on each little stem numerous the plant would be a very ornamental one for rockeries. The anthers open by pores at the apex, behind which they have two hair-like appendages; the style is remarkably blunt, and the base of the ovary is surrounded by a shallow annular disk. In the Economic House the *Quassia amara* is putting forth its crimson buds and will soon be covered with flowers. Among the flower-beds the Boraginaceæ, Labiatæ, Rosaceæ, Euphorbiaceæ, Liliaceæ and Iridaceæ afford abundant material for study. The *Carum Carui*, with its curious pinnate stipules, an organ very rare in the Umbelliferæ, is now in full blossom, while the Sweet Cicely (*Myrrhis odorata*) affords a very visible illustration of the stylopodium or enlarged base of the style.

The way in which the gardens of the Royal Botanic Society are kept in order, notwithstanding the large amount of time which must be spent by the gardener in gathering flowers for lectures, students, etc., reflects great credit on the able secretary Mr. Sowerby. The exhibition of flowers on the 22nd was very good, and the weather being fine was well attended, the Crown Prince and Princess of Germany, and the Prince and Princess of Teck being among the visitors. The plants exhibited included some magnificent azaleas, some of which were a perfect mass of blossom, not a leaf being visible among the flowers. Among the novelties were some handsome large begonias, with double flowers, and some pretty and delicate varieties of aquilegia, the former especially attracting considerable attention. In one corner was a magnificent specimen of *Sarracenia purpurea*, apparently exhibited as a foliage plant. Some of the orchids were splendid plants; the lovely flowers of *Lælia purpurata* and *Masdevallia Mossiæ* being especially admired, as well as the *Masdevallia Haryana*, the brilliancy of its colouring being almost dazzling to the eye.

We learn from Edinburgh that the following medicinal plants are now in blossom in the botanical gardens there, *Carum Carui*, *Rheum palmatum*, *Quassia amara*, *Chelidonium majus*, *Arum maculatum*. The extent to which this valuable garden is being used for teaching purposes may be gathered from the fact that 48,820 specimens of plants were used for lectures and demonstrations during the year 1877, and the number of students attending the botanical class was 389, although the class room only accommodates 230. The venerable and beloved Professor Balfour has recently been prevented by ill health from giving his usual lectures, which have been delivered by his son, Dr. Isaac Balfour. It is to be hoped that better accommodation than that afforded by the present class room will soon be forthcoming, and that the small extra sum of £300 annually, which is necessary to meet the working expenses of the garden, will soon be granted. As it is, there is no botanical garden of the same extent, used for teaching purposes, which is kept at so small an outlay.

'Medicinal Plants' for this month contains an account of the following species:—*Pilocarpus pennatifolius*, *Astragalus gummifera*, *Copaifera Lansdorffii*, *Manihot utilissima*, *Juglans cinerea*, *Quercus alba*, *Quercus tinctoria*, and *Zingiber officinale*. The authors express their opinion that *P. Selloanus* is probably a variety of *P. pennatifolius*, and quote Professor Baillon's opinion that the jaborandi of commerce is most likely obtained from both. The figure shows the leaves rather more pointed than they are usually met with in commerce, and does not represent the notch at the apex which is so frequently noticeable in these leaves. The history of the drug is very thoroughly and clearly summarized, but a few of its more recent applications are overlooked. *Copaifera Lansdorffii*, commonly, but erroneously (as the authors point out) spelt "Langsdorffii," has been chosen as the source of copaiba, apparently on account of its being a native of a large portion of Brazil, whereas the plant officially specified in the Pharmacopœia is a very doubtful member of the genus, and *C. officinalis* does not grow in Brazil. *Juglans cinerea*, or butternut, is an American medicinal plant of which the authors only mention the aperient qualities, although the extract is not uncommonly used as a vermifuge. *Quercus tinctoria*, or black oak bark, is the source of the well-known tanning and dyeing material, quercitron bark. The plates are rather better than usual.

Botanical artists of the male sex had better look to their laurels, for a report reaches us from Kew of a lady artist, whose faithful delineations and clear and careful analysis of the flowers, etc., according to the *Gardener's Chronicle*, "remind us not a little of the beautiful touch which the late Sir William Hooker exhibited on similar work."

At the drug sales this month, among comparatively new drugs, there have been offered casca bark (*Erythrophlœum guineense*), caroba (*Jacaranda procera* and other species), and peach root. Japanese aconite root continues to be offered in large quantities. It would be interesting to know whether it is being used instead of the German root, and if so in what preparations, for although it might do no harm in a liniment, its use might be dangerous in tincture until its relative strength is better determined than is at present the case. The "peach root" is, we have reason to believe, not the root of the common peach, but the root of the negro peach, *Sarcocephalus esculentus*, a native of the same countries as the casca bark, and used by the natives as a tonic and stomachic. This plant belongs to the Cinchonaceæ, and it would be worth while to ascertain if it contains any bitter alkaloid, bearing relation to quinine.

A quantity of false sumbul appears to be in commerce. It may be known from true sumbul by its pale reddish-brown colour, and by the taste of the tincture, which decidedly is that of ammoniacum; the tincture also is darker in colour than that of the genuine root. We hope to lay further details of this before our readers on another occasion; meanwhile, those who have tincture of sumbul in stock will do well to taste it and see if it be genuine.

In boggy meadows and wet places may now be found the bogbean (*Menyanthes trifoliata*), one of our loveliest wild flowers, but growing usually on such treacherous soil as to render it by no means easy to gather. Like the primrose this plant has blossoms of two kinds. The form with short styles is said by Darwin to have larger pollen grains than the long-styled form, and the former appears to be sterile with its own pollen, since at Kew, where it grows alone, the seeds never germinate. Like some other aquatic plants if the flowers remain submerged, they continue closed and fertilize themselves.

In damp meadows the bistort may here and there be seen raising its pretty pink head above the tall grass, but is easily overlooked unless carefully searched for. The curious twisted root of this plant is said to contain an abundance of sphæraphides similar to those of rhubarb root. By the wayside everywhere now, the herb bennet, or avens, of which the root was formerly known as *Radix caryophyllata*, from its clove-like taste, may be found in blossom. The curious purple meditullium of the root is very marked, and is a feature by which it is easily distinguished from arnica root, with which it has occasionally been mixed in commerce. The leaves afford an illustration of the terms lyrate and interruptedly pinnate. Another pretty little plant may be found in damp hilly meadows near streams, the ladies' mantle, *Alchemilla vulgaris*, which is worth notice from a botanical point of view, from being a rosaceous plant with only four stamens and from most of the flowers having either the anthers or the stigma more or less rudimentary, as if, from the Darwinian point of view, it were becoming diœcious.

In the Economic House at Kew the cinnamon and cassia plants are now in blossom, as well as the ipecacuanha plant and the chocolate tree, while the coca plant is covered with buds and will soon be full of blossom. *Asclepias curassavica*, the ipecacuanha of the West Indies, is still in blossom. The flowers of the cinnamon, although not very conspicuous, on account of their small size, are interesting on account of the parts of the flower having a ternary arrangement. The upper portion of the six perianth lobes usually breaks away transversely. Of the nine stamens, six are introrse, and three which form an inner whorl are extrorse. The stamens, as is usually the case in the Lauraceæ, have valvate anthers, but only the inner whorl have glands at the base of the filaments. The structure of these anthers is well shown in Bentley and Trimen's 'Medicinal Plants,' No. 224. The cocoa tree, which is here a diminutive plant, scarcely a yard high, has a very singular appearance from the small pink flowers springing from the trunk, the extrorse anthers being held back in the hooded bases of the petals somewhat after the fashion of the Kalmia, so that it is almost impossible for the flower to become self-fertilized.

In the open ground the phu, or valerian of the Greeks (*Valeriana Phu*), is in blossom, although the officinal species is only in bud. It must not be forgotten that the plant commonly called Greek valerian, or Jacob's ladder, belongs to an entirely different family, Polemoniaceæ. The American valerian with its handsome yellow flowers is now in blossom: this plant belongs to the ladies' slipper genus of orchids, *Cypripedium*, and is used in North America as a nervine tonic. *Carum Carui*, *Podophyllum peltatum*, and two of the plants yielding orris root, *Iris florentina* and *Iris germanica*, are also in blossom. The former is easily recognized by its delicate pale-blue flowers. The stigma must be looked for by turning back the apex of the petaloid styles. *Sarracenia purpurea* will also be in blossom in a few days.

At the gardens of the Apothecaries' Society at Chelsea numerous medicinal plants are in blossom: *Geranium maculatum*, one of the plants yielding alum root in North America; coriander (*Coriaria myrtifolia*), a poisonous plant whose leaves were once found mixed with senna on the continent; dulcamara; and masterwort, formerly used in medicine, and the root of which was recently detected among German aconite root. The mulberry, woad, horseradish, and a fine specimen of biennial henbane are also to be seen in flower. The latter with its usually eccentricity has sprung up in the wrong place and need not be looked for in the bed appropriated to the solanaceous plants, but under a small tree near the Curator's house. There are to be seen in this ancient but valuable garden some fine specimens of *Rheum palmatum*, var. *tanguticum*, which has been stated to be one of the principal sources of Chinese rhubarb. The plants seem to be of much more vigorous growth than the specimen of the old *Rheum palmatum*. The new variety has much longer leaf-stalks, more numerous and larger leaves, and the veinlets on the under surface of the leaves are scarcely visible, while in the old plant they look almost like black lace. This is owing to the new variety having the under surface of the leaves densely covered with forked hairs, which are scarcely perceptible in *Rheum palmatum*. The leaf-stalks are rounded at the base, but towards the leaf form a very marked angular keel on the upper surface. In *Rheum palmatum* the leafstalks have a furrow instead of a ridge on the upper surface close to the leaf.

A paper on casca, or sassy bark has recently appeared in the *British Medical Journal*.* Those who

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are preparing tincture for commercial purposes will do well to remember that merely powdering it in a mortar causes most violent sneezing as well as poisonous symptoms, and that it should therefore be moistened before being powdered. Until recently great difficulty was experienced in obtaining this drug, and notwithstanding Dr. Brunton's description of its physiological action, it has until recently scarcely been noticed. Now, however, an abundance is obtainable, several bales of the barks being this week offered at the London sales. It has been suggested that as there is a possibility of confounding the names casca and cascarilla, it will be advisable to call the tincture, which is the preparation recommended to be used, *tinctura erythrophlœi.*

Sarracenia purpurea has recently come to light again as a remedy, in a Russian medical paper, this time for gout, the powder being given in doses of one or two teaspoonfuls morning and evening. The violence of the attacks are said to become greatly lessened under its use.

New Remedies, for April, quotes a statement, by Dr. U. H. Long, of Louisville, to the effect that he has used mistletoe (*Viscum album*) for ten years successfully as a substitute for ergot. He states that it acts with more certainty and promptness, and that it causes natural, *i. e.*, intermittent contractions, so that it can be used at any stage of labour, and that the full action of the drug becomes manifest in from twenty-five to firty minutes after ingestion. The tincture is made by taking eight ounces of dried leaves, saturating them with boiling water, and adding alcohol to make one pint, letting the tincture stand ten days before filtering. The infusion is made by taking two ounces of dried, or four ounces of the fresh leaves, and pouring on them a pint of boiling water; when cool it is ready for use. From two to four ounces are given as a dose, and may be repeated in twenty minutes if necessary. Dr. Long prefers, however, the fluid extract, for which a formula is not given; but it may be presumed that it is prepared according to the United States Pharmacopœia process. The green leaves are said to impart a disagreeable taste, which is lost in drying. The mistletoe used grows generally in his neighbourhood on *Ulmus nemoralis* and *Quercus aquatica*, but Dr. Long is of opinion that the properties of mistletoe are not affected by the character of the tree on which it is parasitical.

Mr. E. Perret has described a method of removing the colouring matter of scammony resin. He states that the colouring matter is in combination with alumina and lime, and is easily precipitated by adding a few drops of sulphuric acid to the concentrated tincture, which has an alkaline reaction, until it becomes neutral. When the precipitate has settled, the clear colourless liquid, after removing the spirit by distillation, and heating the residue to 102° C., yields a pure and white resin.

A new reagent for microscopists has lately been discovered in the shape of phoroglucin, which has the property of colouring woody tissue reddish violet. The woody tissue is first moistened with hydrochloric acid, and then with an alcoholic solution of an extract of cherry root bark, which as well as that of the apple and pear, contains phoroglucin.

Dr. Haussmann reports, in a Berlin medical paper, that a 5 per cent. aqueous solution of carbolic acid proves more effectual in the cure of sore nipples than either nitrate of silver or lead lotion.

Dr. Lausing, of the Philadelphia *Medical Times*, has found a new use for ergot, with which he says he has successfully treated severe cases of hæmorrhoids.

In the *Lyons Médicale*, Dr. Planat states that arnica acts most rapidly and effectually upon boils or similar eruptions. He administers doses of twenty-five to thirty drops of the tincture every two hours, or applies a poultice, composed of ten parts of extract of fresh arnica flowers, and twenty parts of honey, or if that be too liquid, he adds lycopodium, a drug which homœopathists assert to be almost a specific for boils. Another homœopathic remedy has recently attracted the notice of the allopaths, viz., *Anemone pulsatilla*, which is now being tried for leucorrhœa and other female disorders.

Chaulmúgra oil, pure specimens of which were exhibited at a recent meeting of the Pharmaceutical Society, is now coming into commerce, and appears likely to receive that attention from the medical profession which is merited by its undoubtedly powerful alterative properties. Those who obtain it will do well to remember that the article is one which is very liable to adulteration in India, and that tests for its purity have been published by Dr. Dymock in this Journal.

From New Zealand a new remedy for diarrhœa in men and animals is reported, of which it is asserted that two doses of the decoction will always effect a cure, even in bad cases. The remedy is one which is said to have long been used with success by the Maories. It consists of the leaves of a shrub called "roromiko," but of the botanical name of which no information is at present attainable. The decoction though slightly bitter, is said to be not disagreeable.

A curious use for a rosaceous plant, *Comarum palustre*, is mentioned in Dr. R. Stierlin's recent work on 'Beer, and its Adulterations, etc.' It is there stated that in Germany it is added to beer to cause thirst.

Mr. Sidney H. Vines's lecture "On the Chemical Aspects of Vegetable Physiology" recently delivered before the Chemical Society, has been already noticed in this Journal. The subject, however, is one of such extreme interest as to merit some further observations in the "Month." That chlorophyll does play an important part in the act of assimilation by plants, is as certain as that the colouring matter of the blood is vitally concerned in the process of blood oxidation. It is also known that the act of assimilation primarily concerns itself with the decomposition of carbonic anhydride existing in the atmosphere under the influence of sunlight, and that starch is an accompanying product. But as regards the precise reactions by which these final results obtain, or even of the constitution of chlorophyll itself, our knowledge is most imperfect. For instance, while most observers agree that iron enters into the molecular composition of chlorophyll, this is by no means universally conceded, and the statement has been characterized as a bold and unwarrantable attempt to compare chlorophyll in its general nature, with hæmatocrystalline of the blood. Again, it is disputed whether chlorophyll is a nitrogenous substance; it probably is, but no final assertion can be made upon the subject. From these facts and others of a like kind it follows that it is entirely premature to speculate upon the precise quality and quantity of those reactions and functions excited by substances of which even the composition is uncertain; and that any such speculations are premature, is proved by their number and their discordance. Certain vegetable physiologists who were present and took part in the discussion following the lecture in question, said they only waited for the chemists to discover more facts before they were prepared to substitute a better philosophy for the one at present in use. This is all very well, but such a philosophy surely comes better from the chemists who discover the facts. If the vegetable physiologist is to sit down while the chemist works and merely apply the discoveries effected by others, then his function in nature is not a very serviceable one; at least, it is one which can be dispensed with. This discussion about chlorophyll reminds one of an older discussion about bile, and as it was doubted whether the bile was a chemically individual colouring matter, or a mixture of different colouring principles and other substances, so the same doubt attaches to what this day is known as chlorophyll. Chemistry, however, discovered solvents for these principles of the bile, and gradually they were separated and obtained in isolated pure states; but the animal physiologists have not even to this time arrived at a proper knowledge of the functions of bile, and when the explanation arrives, it will arrive in all probability from chemists. What is wanted as regards chlorophyll is that which was done with bile. It should be extracted in as pure a state as is possible by solvents, and when thus obtained it should be analysed and submitted to processes in which the products should be qualitatively and quantitatively determined. These processes should be in imitation, as far as can be, of those believed to occur in nature, and what is supposed to occur under other conditions. Thus the chlorophyll should be exposed to carbonic anhydride and aqueous vapour in sunlight. It should be exposed to the action of atmospheric gases. Further, these two processes should be alternately repeated; finally, chlorophyll should be submitted to processes of hydration and oxidation. Even if it were not possible to start with pure chlorophyll, one could start with a preparation in which this substance should form the predominating constituent, and accordingly the predominating products of change would be those resulting from the chlorophyll. The line of study and research here indicated is one which it is not only desirable to apply to chlorophyll, but it could be profitably extended to the other subjects touched upon by Mr. Vines in his interesting and useful *résumé* of the points of contact between chemistry and vegetable physiology.

Gréhaut's recent experiments* upon the absorption of carbonic oxide by the blood have not only confirmed previously acertained facts, but have given them a quantitative expression. It is well known that poisoning by carbonic oxide occurs through the combination of this gas with the colouring matter of the blood, so that in this way the red corpuscles are incapacitated for taking up oxygen. Gréhaut has determined that an animal breathing an atmosphere containing only $\frac{1}{770}$th of carbonic oxide may absorb enough of this gas in thirty minutes to destroy the capacity of fully one half of the red corpuscles for taking up oxygen. The way in which he arrived at this result was as follows:—A sample of blood was drawn from the superior cava of a dog, which was then made to breathe an atmosphere containing a known amount of carbonic oxide for a definite time; another sample of blood was then withdrawn. Then, again, the animal was made to breathe pure air, and a third sample of blood taken. These three samples were defibrinated and shaken with oxygen, after which the contained gases were extracted *in vacuo* and analysed. From the amount of oxygen thus obtained, it was easy to calculate the degree in which the oxygen absorbing capacity of the blood corpuscles had been destroyed by the carbonic oxide.

* *Comptes Rendus*, April 8, 1878.

Von Mering has conducted an investigation regarding the destiny of saccharine matter contained in the digestive tube; not only as regards sugar introduced as such into the body, but also that resulting from the change of starchy matters. He finds that the lacteals are not concerned in the absorption of sugar; the lymph and chyle contain invariably about as much as the serum of the blood, which also constantly contains sugar. The portal blood alone contains a superior quantity of saccharine matter during the digestion of carbohydrates. Von Mering thinks that the liver abstracts this excess of sugar from the portal blood during its passage through that organ.

O. Nasse has published an interesting paper upon the influence of different gases on fermentation, and among many other experiments he describes the following: Ice-cold solutions of cane sugar were mixed with invertin (a ferment derived from yeast), in glass tubes and saturated with various gases. The contents of the different tubes were then heated to boiling and a determination made of the amount of inverted sugar in each. In one case where carbonic anhydride had been employed 20 miligrams of inverted sugar were found; with hydrogen, 8 miligrams, and with air 7 miligrams; while those which had been treated with oxygen and carbonic oxide contained none at all. In other words oxygen and carbonic oxide inhibit the power of the particular ferment employed.

It appears that other minerals besides quartz are liable to contain fluid cavities. A. Schertal has described a specimen of Spanish blende having a cavity filled with fluid containing sodium chloride and sulphate of zinc, the former being the predominating constituent.

The *Academy* of the 11th inst. points out very justly that the new quarterly journal termed *Brain* is an instance of a general tendency exhibited by the times; it is a good thing which is superfluous. "There is no single article in the first number of *Brain* which might not have found an appropriate home elsewhere."

Another of the men who have done honour to pharmacy has recently passed away in Félix Boudet, who was one of the earliest editors of the *Journal de Pharmacie et de Chimie*. M. Boudet was elected an Honorary Member of the Pharmaceutical Society of Great Britain in 1841.

Many are the uses to which the telephone is already applied, and among them is the following:—The fishing season happens when the herrings come into the shoals and deposit their eggs; the fish often remove, however, to deep water again before the fishermen are aware of their presence. Of late to avoid this calamity about 120 miles of submarine cable have been laid in the Norwegian herring fisheries, and with it there are a number of telephones in connection, so that all the fishermen on the coast can be immediately notified.

M. Bréguet has described a new form or so-called mercurial telephone, while Messrs. Arthur Le Neve Foster and H. Hall have applied the telephone to coal-mining service. By connecting the instrument with an anemometer in such a way that at every tenth revolution a small pin strikes against a steel spring, the sound is communicated to the telephone. In this way by counting the sounds in a given time it is possible to determine the rate of the air current, and thus above ground the state of ventilation below may be ascertained.

Among other uses of the telephone there is one to which the *British Medical Journal* draws attention in its issue for the 11th inst. According to this contemporary the telephone has been in use in the house of a medical man, to enable one of the family who is suffering from an infectious exanthem to communicate with her family and friends. Obviously this application of the telephone is one which could find useful extension in fever and other hospitals.

A correspondent has stated in effect that the Dispensing Memoranda will do a vast amount of good by checking such errors as that of calling a preparation by a name which originally applied to one differing materially in composition; it may also be added for the guidance of correspondents that the value of the formulæ supplied would be more appreciated if the sources from whence they are derived were added.

In the case of tr. sap. virid. co., it has been stated in several replies that it was merely soft or green soap in spirit. This view of the subject was called in question last month. If a simple tincture of soap, why should "co." be added? A communication from Professor Bedford, of New York, in the Journal of May 11, sets this subject pretty well at rest, in giving the formulæ for tr. sap. virid. and tr. sap. co. Had some further observations on the source of the authority for these formulæ been added, the information would have been more valuable. The same writer will probably on a future occasion supply the deficiency.

The first prescription in the usual order is that of No. 102; it is somewhat complex in its character, but the reactions that occur have been well stated by Mr. Langbeck in the subsequent week's Journal. The resulting white precipitate is citrate of bismuth.

A separation must necessarily take place in mixing together equal parts of tr. benz. co. and tr. conii, as in No. 103, the one being a rectified spirit tincture, whilst the other is made with proof spirit. The mixture should be shaken before being used, but unless verbal directions be given to that effect, there should be no filtration. It is quite usual to send out tr. benz. co. either alone or combined with tr. conii for inhalation. If the tr. benz. co. be combined with a proof spirit tincture, as that in question, a separation must necessarily take place, and in no case should the deposited portion be removed. From one to two drachms of rectified spirit will remove the cloudiness of the mixture caused by the separation of the resin of the benzoin, but such an addition is not to be recommended without the writer's sanction, as it is only the appearance that is sought to be improved. There must be a separation of resin to a much greater extent when the quantity ordered is mixed with hot water for an inhalation, and it is possible to sacrifice the medicinal effect of a prescription by an endeavour to make it assume an elegant appearance. Both tinctures are B.P. preparations, and, dispensed accordingly, the mixture must be cloudy and temporarily deposit some of the resin which can without difficulty be shaken up on each occasion of its being used.

The name Palma Christi of No. 104 applies to a preparation made from the leaves of the castor oil plant and used as a lactogogue; the leaves are very extensively used for this purpose in India. In a paper read before the British Association in Edinburgh in 1850, and afterwards published in the *Lancet* of the same year, Dr. McWilliam brought the medicinal effect of the plant under the notice of the profession. Dr. Tyler Smith also gave his attention to it and arrived at the conclusion that the plant possessed distinct lactagogue properties. A paper on the same subject was subsequently read at the Medical Society of London by Dr. Routh. From the replies which have been received it appears evident that the reference is to a proprietary preparation, the source of which must be sought in the advertisements of this Journal.

With regard to syr. ferri superphosph. co. of No. 105, at an evening meeting of the Pharmaceutical Society, May 1, 1851, Mr. Greenish read a paper directing attention to a preparation consisting of phosphate of iron dissolved in metaphosphoric acid. The salt formed was, after cooling, deliquescent, of a slaty colour, soluble in water, and free from any inky taste. A syrup was made by dissolving 5 grs. in the drachm of simple syrup. The term superphosphate of iron was introduced into medicine for the first time with this preparation. Subsequently an additional syrup was made by adding phosphate of lime to the former one, which was called syrup of superphosphate of iron and lime. In the B.P. 1867, there was introduced a formula for a syr. ferri phosph., but to this the name of superphosphate has not been given. The name syr. ferri superphosph. would therefore apply to the preparation described in the paper to which reference has been made, and the addition of "co.," which has no place in the original, would not render it Parrish's Food, and certainly not Easton's Syrup, neither could the "co." override the "superphosph." If there is no syr. ferri superphosph. co. by that or any other maker, the syr. ferri superphosph. should be used.

Those who write prescriptions can scarcely be expected to keep strict pace with science, and in the prescription referred to (No. 106), unless it contained some indication to the contrary, sodæ bicarb. should certainly be dispensed. Considering that in very few establishments any other label than carbonate of soda is used, it does seem straining a point to argue that in all cases when sodæ carb. is written in a prescription that sodæ carb. should be employed, and not the bicarb., which would be retailed to a request for carbonate of soda. The carbonate, formerly subcarbonate, is only occasionally and in very exceptional cases prescribed and then usually as subcarb. It would be an anomaly to dispense sodæ carb. in prescriptions, whilst at the same time the B. P. directs the preparations of sodæ bicarb. only for internal administrations. When, therefore, sodæ carb. is ordered in a prescription, sodæ bicarb. should be used and carb. only when specially directed.

Liq. Hoffmani, No. 107, sometimes called Hoffman's anodyne spirit, is a *compound* spirit of ether, and when ordered that alone should be used. Hoffman's anodyne is a preparation of ether with the addition of ethereal oil, or oil of wine as it is sometimes called, and most probably was originally an impure ethereal product; the distillation being continued after all the ether had passed over resulting in the production of some ethereal oil at a higher temperature. Medical authorities have reported in favour of oil of wine as a tranquilizing and anodyne remedy. It is just possible that by some pharmacists it may be considered as superseded by sp. ætheris, B. P., but as the sp. ætheris differs in composition from that to which the name of Hoffman's anodyne originally applied, the one cannot be substituted for the other. However much it may be desired that the sp. æther. B. P., should supersede the compound spirit, so long as the preparations differ in composition this cannot be done by the dispenser, and like so many other very desirable things, the change must be initiated by the medical profession ordering sp. ætheris, instead of sp. ætheris co., or Hoffman's anodyne. Many of them may probably be under the impression that in writing Hoffman's anodyne or sp. æther. co., they are ordering the B. P. preparation, sp. ætheris or spirit of ether.

In the 'Pharmacopœia Londiniensis' of 1826, the compound spirit of sulphuric ether contained ethereal oil, and in 1851 the name was altered to compound spirit of ether, still retaining the ethereal oil. But in the B. P. spirit of ether appears without the ethereal oil.

Several foreign Pharmacopœias give the formula for spirit. ætheris without ethereal oil, and add as a synonym, Hoffman's anodyne, as pointed out by Mr. Squire in his reply to this query; but since the ethereal oil has been left out of the formula in the British Pharmacopœia that synonym has been omitted.

Pereira gives the formula for a compound spirit of sulphuric ether containing ethereal oil, and states, "This preparation is commonly called Hoffman's mineral anodyne liquor, being made in imitation of a preparation described by Hoffman, 'De acido vitrioli vinosi,' 1732." It is clear, therefore, that the sp. æth. sulph. co. was called Hoffman's anodyne, and it is equally clear that from the absence of the ethereal oil from the formula that the spirit of ether is neither the sp. æther. co. nor Hoffman's anodyne, and cannot correctly be dispensed when either of these two is ordered in a prescription.

The insolubility of salicylic acid in water, as in No. 108, has been on previous occasions commented on. The prescription referred to cannot be sent out clear, if accurately dispensed, but it is quite possible that the previous dispenser had an eye to elegance and sent out a clear mixture, which may be accomplished by dissolving the salicylic acid in a little more spirit, about half as much again, then adding the glycerine and finally the water. There is, however, a probability that the salicylic acid will crystallize out at a lower temperature. If the writer of the prescription resides near to where the prescription was first dispensed, it would have been better that the dispenser should have received his sanction to such an addition before he adopted it; and this course would have enabled the writer to order a larger quantity of spirit so as to keep the salicylic acid in solution, if other circumstances warranted him in doing so; if they did not, which is quite possible, then the dispenser would not be justified in adding the extra quantity of spirit. Each case must be judged on its own merits, and the dispenser should be careful when he studies elegance at the expense of accuracy, and increases the quantity of any one ingredient in a prescription, or adds one not already there to accomplish what he may conceive to be a more elegant result.

Phosphorus when ordered in pills, as in No. 109, may be dissolved in bisulphide of carbon. A very satisfactory method in this instance may be adopted by making the quinine and ferri redact. into a tolerably stiff mass with glycerine and tragacanth, dissolving the phosphorus in a mortar with a few drops of bisulphide of carbon, and before the fluid evaporates, adding ol. theobromæ in the proportion of ½ grain to each pill, that is 6 grains to 12 pills, then mix the dissolved phosphorus well with the ol. theobromæ before adding the mass of quinine and ferri redact., and work them together. The mass makes readily, and keeps well. The phosphorus is in an unoxidized state, and the pill is of the size required.

The prescription No. 110 is a turpentine emulsion, and may be satisfactorily made by rubbing the yolk of egg in a mortar with the acetic acid, previously mixed with an equal quantity of rose water. These being put into a bottle of double or treble the capacity required, the turpentine should be gradually added, the bottle being shaken after each addition, and finally the essence of lemon. Its emulsive character improves by keeping.

In No. 111 it may be a question whether resin. copaibæ was intended by the writer, but it is clearly enough written and an effort must be made to accomplish an emulsion. This may be done by rubbing the resina copaibæ with ℥i sugar of milk, and ℥iv powdered gum arabic, gradually adding the water and finally ℥iv syrup with the chloric ether. Different samples of resin yield very different results. From the tenour of the letter, it would seem that the prescriber is a resident in the town where the prescription was sent to be dispensed. The writer states "it was sent to me to-day by one of our leading physicians." Such being the case the writer of prescription should have been referred to. It is a duty the dispenser owes to the prescriber to bring under his notice any apparent, as well as any absolute, error in a prescription that he may have written, any decomposition affecting one or more essential ingredients; and it is a duty he owes to his colleagues to sustain his position as an educated pharmacist, receiving on one hand a combination of therapeutic agents in the form of a prescription from the medical attendant, and on the other dispensing that combination with accuracy, honesty, and intelligence. The medical profession resent the pushing of nostrums under their noses, but they appreciate a proper representation with regard to an apparent error in a prescription. In this way only can mutual confidence be established, and the pharmacist occupy his proper place in relation to the physician.

In a "Note on the Exhibition of Resin of Copaiba,"* Mr. Gerrard, of University College Hospital, objecting to the usual method of rendering the resin of copaiba miscible with water, by means of spirit and mucilage of acacia, suggests the following formula. Take of—

Resin of Copaiba	15 grains.
Compound Powder of Almonds . .	30 „
Water to	1 ounce.

Rub the resin with the powder until well incorporated, then add the water after the manner of forming an emulsion.

However valuable this suggestion may be, it will be evident at a glance that the almonds cannot be employed as the emulsifying agent in a private prescription.

* *Pharmaceutical Journal*, July 26, 1873, page 26.

The Pharmaceutical Journal.

SATURDAY, MAY 25, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE ALLEGED ADULTERATION OF FLOUR WITH ALUM.

THE credit of public analysts as a body will certainly not be enhanced by the case lately brought before the magistrates at the Selby Petty Sessions, in which certain millers in the locality were prosecuted for having sold flour alleged to be mixed with alum to the extent of ten grains and eighteen grains in the four pounds of flour. This prosecution had been instituted upon the basis of a report made by Mr. A. H. ALLEN, the analyst for the West Riding, and when the case first came on for hearing application was made for samples to be sent up to the authorities at Somerset House for other analyses to be made. The result of this further examination was that the Excise chemists reported the samples of flour to contain quantities of alumina corresponding tolerably well with the data given by the West Riding analyst, but there was this important discrepancy between the two reports, that while the one asserted that the alumina found in the flour represented alum actually existing in the flour, the report of the Excise chemists declared that the flour did not contain alum at all, inasmuch as the alumina in one of the samples of flour examined by them did not exceed the amount which they had found to be present in genuine flour, and as regards the other sample, in which a larger amount of alumina was found, the Excise chemists could not confirm the presence of alum, for though the alumina was in excess of that found in genuine flour, their experiments did not admit of their regarding it as representing alum present in the flour.

Upon the basis of this report of the Excise chemists the counsel for the defence naturally claimed the acquittal of his client, but one of the magistrates, who probably believed in the existence of adulteration, without apparently having such a knowledge of the subject as to be able to perceive that the presence of alumina was not necessarily evidence that alum had been added to the flour as an adulterant, did not take the same view, and he conjectured that what the Excise chemists called alumina the West Riding analyst called alum.

It is evident that the discrepancy in this case between the analysts was mostly in regard to the interpretation of a particular result, viz., the detection of alumina in the flour, and that with the precipitancy too common with public analysts it was assumed, in the first instance, that the alumina found represented alum that had been added. But there is no part of the evidence for the prosecution which justifies this conclusion, except that relating to the experiment with bread made with the flour, which, like all colour tests, is not perhaps so satisfactory as might be desired, and is moreover not direct evidence.

In connection with this subject it must be remem- that as much as twenty years ago, Mr. RICHARD REYNOLDS pointed out in this Journal that although there may be good reason for the opinion that the ash of wheat does not contain alumina as a normal constituent, still there were circumstances under which alumina was likely to be present in the flour made from certain kinds of wheat. As the result of a number of experiments made independently by Mr. REYNOLDS and Dr. LETHEBY it was found that Egyptian wheat was often so largely coated with aluminous earth that the flour made from it gave a considerable percentage of alumina.

Here then is possible explanation of the presence of alumina in flour or bread which entirely does away with the value of evidence based solely on the detection of alumina as such. Even the opinion based upon the amount of alumina present is not to be relied upon, for there is no means of determining whether it is not entirely due to the clay adhering to the grain.

We will not undertake to express any opinion whether or not small quantities of alum would be injurious to health, but it was admitted by the witnesses for the prosecution that such quantities as were found in these cases would probably be harmless, and we desire to draw attention to this fact as indicating on the part of the public analyst a want of due caution in framing his report. Such neglect is no less an injury to the public than the sale of adulterated food. There is quite as much reason for showing that tradesmen, as constituting a section of the public, shall be protected from the damage and annoyance of prosecution as there is for claiming protection against adulteration or any other form of fraud. In a case such as the one now referred to it would have been safer, more prudent, and more just to all concerned, if the analyst had taken the pains to point out to the local authority to whom his report was addressed that there were possibilities of the alumina he had found being derived from another source besides the illegal addition of alum, and consequently that there was at least room for doubting whether a prosecution would be justifiable.

We refer to this point, because the present case furnishes evidence that there is too much need for the chemist to have regard to the reputation not only of himself, but of his class. At best an air of suspicion hangs over the evidence given by chemists, and not unfrequently, this estimate of the class finds expression in such terms as those used by one of the magistrates at Selby, to the effect that analysts could without difficulty be got to say anything. In the case now referred to, it is evident that there is no other foundation for these remarks than the magistrates' notion that alumina and alum were the same thing, and that the use of the word alumina by the Excise chemists was merely a device for misleading the court.

From this point of view, and having regard to the trouble and annoyance caused by unnecessary prosecutions under the Food and Drugs Act, we think that one of the most serviceable amendments in the carying out of that Act would be to cause all cases of alleged adulteration to be referred to a superior body or committee empowered to decide whether the facts adduced in the analyst's reports were sufficient to justify proceedings under the Act. We do not think that the protection afforded to the general public by the Act would be thus in any way reduced, while we feel sure that it would at the same time be a protection to analysts themselves and also to the trading community.

COUNTER PRESCRIBING.

The case of the Apothecaries' Company *v.* Wiggins came on for hearing on Thursday morning in the Court of Queen's Bench, and in some degree it bids fair to supersede the case of the same body against Shepperley as a test case. The prosecution appears to have restricted its pleas to cases in which it contends that the counter practice of the defendant has exceeded that which a chemist and druggist is entitled to engage in, not only by virtue of long established usage, but also, by the twenty-eighth section of the Apothecaries Act, exempting chemists and druggists from the operation of that Act.

At the time of our going to press the case for the prosecution was completed, and Mr. McIntyre, the counsel for the defence, was addressing the Court, when the case was adjourned until Friday morning. We purpose publishing a verbatim report of the case next week. It would obviously be premature to offer any remarks upon this case at present, but we may state as a matter of fact that considerable difficulty appeared to be felt by the Judge from the want of definitions of the apothecary, the surgeon, the physician, and the chemist and druggist, etc., by means of which it would be possible to arrive at some conclusion as to whether certain acts were or were not within the province appertaining to those several designations.

THE WEIGHTS AND MEASURES BILL.

The Bill to consolidate the laws relating to weights and measures has made no progress in Parliament since our last notice, owing, doubtless, to the press of more exciting subjects in the House of Commons. The Council of the Pharmaceutical Society, however, has not been idle in the matter, and the Hon. E. Stanhope, who has charge of the Bill, has, in compliance with remonstrances addressed to him, given notice of amendments which will apparently remove the difficulty anticipated by chemists. By the first notice the right to continue the apothecaries' weight in the sale of drugs will be secured; the second imports the ounce, drachm, and minim into the standard "measures of capacity."

Provincial Transactions.

CHEMISTS AND DRUGGISTS' TRADE ASSOCIATION.

The annual general meeting of this Association took place on Tuesday, the 14th inst., at the Inns of Court Hotel.

The business of the day commenced with a meeting of the General Committee at 11 o'clock, Mr. Jones of Leamington, President, in the chair.

The following gentlemen were added to the Committee: Messrs. Passmore, Exeter; Dyer, Halifax; Rimmington, Bradford; R. Wood, Macclesfield; Thomas Bates, London; T. B. Gostling, Diss; Dr. Symes, Liverpool; Hales, Hull; George Brown, Sandown, I. of W.; G. H. Wright, London; Haffenden, Brighton; Applegate, London; Pattison, London; Stoddart, Bristol; Corey, Newport, I. of W.; Swann, Newcastle-on-Tyne; J. Horncastle, London; Jaap, Glasgow; R. Drane, Cardiff; Thomas Williams, Llandudno; Hayman, Neath; Ainsley, Edinburgh; Hillier, Bath, and Thornton, Exmouth.

The report of the Executive Committee was received and adopted, the discussion upon it being deferred until the general meeting later in the day, on the motion of Mr. Vizer (Brighton), seconded by Mr. Jessop (Halifax).

The General Committee then proceeded to consider the list of Executive Committee to be recommended to the general meeting. The Chairman called attention to the fact that at present there was no member of the executive resident in the district south of London.

Scrutineers having been appointed, the following list was adopted for recommendation to the annual meeting. *England.*—Abraham, J., Liverpool; Andrews, F., London; Arblaster, C. J., Birmingham; Barclay, T., Birmingham; Brevitt, W. Y., Wolverhampton; Churchill, W. J., Birmingham; Cross, W. G., Jun., Shrewsbury; Cubley, G. A., Sheffield; Delves, G., Exeter; Greaves, A., Chesterfield; Greenish, T., London; Hampson, R., London; Holdsworth, T. W., Birmingham; Jervis, W., Sheffield; Jones, S. U., Leamington; Reynolds, R., Leeds; Shaw, J., Liverpool; Southall, W., Birmingham; Vizer, E. B., Brighton; Walker, G., Coventry; Earle, F., Hull. *Scotland.*—Fairlie, J. M., Glasgow; Kerr, C., Dundee; Mackenzie, J., Edinburgh.

Mr. Barclay, vice-president, drew attention to the notice of motion given for the general meeting with the object of raising the subscription from 5*s.* to 7*s.* 6*d.*, to which he strongly objected. Their desire was to have, if possible, every member of the trade enrolled in the ranks of the Association, and he was quite satisfied that the proposal if carried out would cut off a large number of members, and he doubted if it would result in any addition of funds to the Association. Mr. Jones no doubt brought forward the motion with the idea of increasing the funds, in order to meet the heavy expenses consequent on the pending law proceedings. He was quite sure that it was the unanimous desire of the trade to fight out this question of counter practice to the very end, even to the House of Lords if necessary, and this would entail a very heavy expenditure. He thought, therefore, the better way would be to retain the subscription at 5*s.* and raise a special fund, say of £2000, for the purpose of conducting this battle. It might be desirable to ask the Pharmaceutical Society to assist in this matter and subscribe to the fund. During the last year that Society had expended over £4000, apart from the educational department, £246 being incurred for legal expenses. He did not wish to bring this matter before the annual meeting unless he were supported by the the General Committee, and that was why he brought it forward then.

Mr. Cotterell (Dover) supported the views expressed by Mr. Barclay. There was, he believed, the residue of the former fund raised for special purposes, which went to the funds of the Pharmaceutical Society. He should like to know if that were so, and if it could be obtained for this purpose.

Mr. Vizer endorsed Mr. Barclay's views as to the subscription, but he was not quite clear about starting another fund. He recommended a further canvass for new subscriptions and donations to the general fund.

A Member suggested that in case of firms each member should subscribe at least 5*s*.

Mr. Slipper did not think it advisable to increase the amount of subscription. He did not think there would be any lack of funds for carrying on the legal proceedings if necessary, but it seemed to him rather premature at present to anticipate having to go to the House of Lords.

Mr. Bates (Macclesfield) thought a large additional number of members were to be obtained with very little difficulty if the trade were properly approached.

Mr. Owen said he came prepared to support the motion to raise the subscriptions, but after what had been said he should not do so.

The Secretary said he had communicated over and over again with the members of the General Committee and others, urging them to endeavour to obtain subscriptions and donations. Besides that, circulars had been sent more than once to every one in the trade.

Mr. Hampson was satisfied that it would be unadvisable to increase the amount of subscription. They wanted to encourage more fellow feeling amongst the trade, and get every one to join so as to obtain more cohesion. He thought it would be wise to initiate a special fund for legal purposes, and a large fund would be necessary.

Mr. William Jones (Birmingham) said that after what he had heard he should not bring forward the motion of which he had given notice.

Mr. Thornton (Bradford) said there was a bill at present before Parliament, which would, if passed, repeal that part of the Apothecaries Act which enabled the Apothecaries' Company to prosecute chemists.

In reply to Mr. Vizer, the Secretary said that the annual report had been issued to every member of the trade.

Mr. Thomas Barclay again urged the necessity of raising a fund for legal purposes.

Mr. Andrews suggested that it would be well if the motion were put before the meeting, and a vote taken upon it. He thought that more might yet be done by canvassing for new members, and he heartily endorsed the remarks of Mr. Hampson, that a more fraternal feeling was needed amongst chemists and druggists themselves.

Mr. Hampson said the fund to which allusion had been made had been absorbed into the general fund of the Pharmaceutical Society and could not be got at as a separate fund. He deprecated the idea of going to the meeting of the Pharmaceutical Society and putting pressure on the Council in the form of a resolution, but if that body were approached in a proper mode, it might possibly be induced to open its coffers and assist in the work.

Mr. Barclay said he thought there would be no undue pressure if a number of members of the Pharmaceutical Society, who thought the Society should contribute to the Shepperley fund, brought it forward in the form of a resolution.

Mr. Owen said it would be much better not to mention any particular case; they ought to go on the ground of principle.

Mr. Preston deprecated any increase of subscription, but at the same time it was necessary that the executive should be well supported with funds if it were to carry on the work effectually. He did not see the necessity for raising a fund at the present moment, but the new Executive about to be elected should have power to call for further support, if needed.

Mr. Barclay said that it was his intention.

Mr. Mackenzie (Edinburgh) thought they were all agreed not to raise the subscription, but if they wanted to strike terror into their foes they must have plenty of money at their command.

Mr. Barclay said he would move a resolution at the general meeting to the effect that a special fund of at least £2000 be raised by donations to be used in protecting and furthering the legitimate interests of chemists and druggists.

The notice convening the general meeting was then read, and the business proceeded with; Mr. S. U. Jones in the chair.

The President, in opening the proceedings, said it afforded him great pleasure to meet the members again. He need scarcely say that during the past year the members of the executive had had a great deal of anxious work. Many questions affecting the interests of the trade had come before them, and had caused much anxiety, but if their labours were rewarded, as he hoped they would be, by bringing these questions to a successful issue, they would not consider that they had laboured in vain. The first serious question which had occupied their attention during the past year, had been the case of the Apothecaries' Company *v.* Shepperley. That case had been before the law courts for some little time, and the judges appeared to consider that the county court judge had not had sufficient evidence before him, and decided that the case should be brought before the Court of Exchequer, where it should be thoroughly argued and decided. That course was agreed to by Sir Henry James, the Association's counsel, and it now remained for the Court of Exchequer to decide whether or not chemists and druggists had a right to prescribe behind their own counters. He would draw particular attention to the remarks which fell from one of the judges, Mr. Baron Cleasby, during the argument of the case. In speaking of the 28th section of the Apothecaries Act, he said that section recognized chemists as a branch of the profession, and reserved to them all the rights which they were in the habit of exercising before 1815. That was what they contended for, and asked for, that chemists and druggists should have the power of exercising those rights which were exercised before 1815; they asked for no more, and would be content with no less. It would therefore be their object to put into the witness box gentlemen who would be prepared to state their own experience of what was done by chemists and druggists prior to 1815, and that they should ask the court to say they had a right to do at the present time. Some of the cases under the Adulteration Act had been a source of great annoyance to chemists during the past year, and the executive had been obliged to instruct the solicitor to defend some parties, especially Messrs. Cutting and Son, for the sale of soda water, which it was said did not contain soda, and also for having sold cayenne pepper said to be adulterated. Those cases were decided in their favour, and therefore he hoped that before analysts dragged chemists before the magistrates again they would be careful to see that the analysis was correct. A Medical Act Amendment Bill had been brought into the House of Commons, by Dr. Lush, which would have set the question of prescribing at rest as far as they were concerned, because it would have prevented it altogether. But although there was very little time left for taking action in that matter, they did take action, They met at Birmingham, and Mr. Chamberlain and Mr. Samson Lloyd deserved their warmest thanks for the assistance they gave. The result of the opposition was that Dr. Lush withdrew the Bill. The next matter he need mention was the Dental Practitioners Bill. According to that Bill a chemist would not be able to draw or stop a tooth without infringing the law; but being convinced that was not intended, they made a suggestion to Sir John Lubbock, who kindly met a deputation at the House of Commons, and said the objectionable words should be removed or a clause inserted securing chemists the rights they now possessed. The Association numbered now 4000, which, he thought, was pretty good to begin with. But he was not yet satisfied; he hoped for a still greater increase, and that the members should form themselves into a compact, solid, and united body for the purpose of resisting any encroachment which might be made on their interests, or to prevent any action being taken to damage those interests which they thought they ought to protect. He hoped, therefore, they would be united and firm in their action, that the executive for the current year would be supported, and that the society would continue to flourish and increase, so as to be a service to chemists and druggists of Great Britain.

The printed report was taken as read.

Mr. Lance moved, and Mr. Postans seconded, a resolution that the report of the Executive Committee, with the statement of accounts be received and adopted.

Mr. Owen having remarked on the satisfactory nature of the report,

Mr. Clark (Leicester) drew attention to the fact that there were about one hundred firms on the list of members who only subscribed five shillings for the firm, whereas they should be asked to subscribe five shillings for each member. He hoped the executive would remember this during the coming year.

The resolution was then put and carried unanimously.

Mr. G. H. Wright (London) moved a vote of thanks to the Executive Committee for its labours during the year.

Mr. Thornton (Bradford) seconded the motion, which was carried unanimously.

The President returned thanks for himself and colleagues for the courteous manner in which the report had been received, which they felt extremely gratifying, and said they would continue to do their best to promote the interests of the trade.

Mr. Churchill (Birmingham) moved as an amendment to Rule 1: "That this Society shall be called 'The Chemists and Druggists' Trade Association of Great Britain.'" It had been thought desirable to add the words "of Great Britain," because there seemed to be in the minds of some people such a cloudiness on this question that they thought it was merely a local Association at Birmingham. The attendance in the room would show that this was not so, for many towns had sent more representatives than Birmingham. He had no doubt this would be agreed to, so that there should be no doubt in the mind of anybody that the Association was for the benefit of chemists and druggists throughout the whole of Great Britain.

Mr. Slipper (London) did not think himself that this resolution was necessary, but as their Birmingham friends were so modest and did not like to have all the honours attributed to them or anything else thrown upon them, he should be happy to second the resolution. He was sorry to say that in one instance the Editor of the *Pharmaceutical Journal* had thought proper, as he considered in exceedingly bad taste, to apply the term, "Birmingham Association," to this body; not that it was any discredit to the Association that it originated in Birmingham, much to the credit of that town, but still he thought it was in exceedingly bad taste to speak of it as the Birmingham Association when it was a trade association of Great Britain.

Mr. Fairlie (Glasgow) had much pleasure in supporting the resolution. He felt that the friends who had supported this society had never been looked upon by the great bulk of the trade as having any particular relation to Birmingham further than having had their head-quarters and office there. They had now about two hundred members from the other side of the border in the total of four thousand, which showed that it was a truly representative association of the whole trade.

Mr. Postans suggested that it would be advisable to go a little further and make it the Chemists and Druggists' Trade Association of Great Britain and Ireland. He thought it would be very well if they could make one large association, and as the Pharmaceutical Conference would be meeting this year in Dublin probably the time was not far distant when there would be a Pharmaceutical Society of Great Britain and Ireland, and it would be a step in advance if they were to take the initiative.

Mr. Pond (London) thought it would tend to the dignity and prosperity of the Association to include Ireland in the scope of its operations.

Mr. Cross (Shrewsbury) stated that the Executive Committee had received applications from Ireland to extend their operations to that country, but it had not been able to accede to the application for want of sufficient information.

The Solicitor remarked that although it might be desirable for trade purposes that an association should be formed in Ireland, there would be almost insuperable difficulties in working that association from any centre in England, the law in Ireland being so entirely different.

Mr. Hampson said it was very desirable there should be one association for the two countries, but he could not help remembering the correspondence which had recently taken place with the Pharmaceutical Society, when he was anxious there should be only one association. There was, however, such a strong national insular sentiment on the part of their Irish friends as would, he thought, prevent the attainment of their wishes. At any rate it would be premature to attempt to carry out anything of the kind at present.

The resolution was put and carried unanimously.

Mr. Ponder asked what connection, if any, this Association had with the Pharmaceutical Society.

The President said not any.

The next business on the agenda paper was the motion of which Mr. W. Jones had given notice.

Mr. W. Jones said he had asked permission to withdraw it, his only object being to strengthen the hands of the executive, and it appeared from the discussion which had taken place at the meeting of the general committee that it did not meet with approval.

Mr. Barclay said he quite sympathized with Mr. Jones's object, because he was sure they all had but one object, namely, to increase the funds of the Association, but he felt very strongly that to increase the subscription beyond five shillings would be disadvantageous to the general interests of the Association. What they wanted was political influence; they wanted to get the whole of the trade in this country banded together in one association, and anything beyond five shillings would be a tax upon their brethren which would be hard for them to bear, and therefore he thought it was that they should keep to the subscription of five shillings, which was the minimum, and did not preclude any one from sending donations to the secretary. But it was necessary they should have money, and especially as the meeting had approved of the report, which committed the executive to the costly warfare in the law courts in defending chemists against the Apothecaries' Company. The case of the Company against Wiggins would come on that week, probably the next day, and, as far as they could tell, the expense of that alone would be two hundred pounds. Through the success which they had achieved already in Shepperley's case they were now in a position which would enable them to appeal from court to court until they got to the House of Lords, and he believed it was the wish of the meeting and of the chemists throughout the country that they should fight that case out to the very end. That feeling he was sure would be endorsed in any meeting throughout the country, as it had been endorsed already in many places, for no question was so popular just now in the country as that of defending their legitimate rights in counter prescribing. But if this case had to be fought the chemists must find them in funds, and, since it was not their wish that the subscriptions should be raised to 7*s.* 6*d.*, it was only right that they should look at the question how the money should be found. If they took the balance sheet for the past year they would find that £1300 had been expended, of which something like £370 had been expended in law, leaving about £1000 for current expenses, and that was really their whole income during the past year. That being so, how could they, with a subscription of five shillings, commit themselves to fight this battle without having some funds in hand? True they had £500 in hand, but they had all kinds of work to do besides this particular case. They had to defend chemists in the courts against the undue interference by analysts under the Adulteration Acts, and he was quite sure it was the wish of members that they should take up every pressing question that presented itself, and that the executive should defend them at any time against any unfair attack, Five hundred pounds was not sufficient for this, therefore he proposed to move this resolution:—"That a special fund of at least £2000 be raised by donations to be used in protecting the legitimate interests of chemists and druggists." That fund would be found to have a great influence in many ways. It would show they were a powerful body, and when they went as a deputation to the Government on any question it would show they had the support of the chemists of the country. He knew they would all subscribe to a fund if the necessity arose, but experience had shown him it was much easier to get money before a contest than after it. The money would not be frittered away, as could be seen from what had been already done. They had expended 25 per cent. of their income in protecting the chemists of the country, whereas if they looked to another body it would be found that from an income of £5000 or £6000 the whole they had expended in this direction was about 4 per cent. The Executive Committee might be trusted to expend it only in such way as would protect the interests of the trade. In the first year of the Association's existence there were something like twenty donors of ten guineas each, twenty of five guineas, others of three guineas, and so on. It would be necessary that that amount should be doubled, because there was now a much wider area to appeal to, and therefore he hoped £2000 would be raised without much difficulty.

Mr. Lance, in seconding the motion, remarked that the members of the Medical Defence Association fixed their subscription at 10*s*. 6*d*. He thought the chemists and druggists could find as many half guineas as they could, and that there ought to be no difficulty in getting this small amount together.

Mr. Urwick had great pleasure in supporting the resolution, because he thought it was the best way of raising the money. The subscription was fixed at a small sum in order that the Association might include all chemists and druggists, and if it had been fixed at a higher rate the Association would not have had so many members as now. It was much better to get the members already enrolled to work in their several districts and to bring in others to increase the funds, than to raise the subscription. The Association had now shown that it could do real work, and it commended itself to every member of the trade. He had heard on very good information that the prosecution in Shepperley's case would not go further because the promoters had reason to doubt whether they would succeed; but he hoped the Association would insist on the case being carried further, because he felt it could be brought to a successful issue. He considered that the Pharmaceutical Society was greatly indebted to that Association for what it had done, for if it had not been for the action taken in Shepperley's case in and opposing Dr. Lush's Bill, there would have been very little matter for congratulation in its present report. Therefore, as a pharmaceutical chemist, he begged to thank the executive of this Association for its labours. Another matter he might mention was this. He had signed a circular supporting three candidates for seats at the Council of the Pharmaceutical Society, and he did so not because he was a member of this Association, but from regard to the Pharmaceutical Society. He was first a member of the Pharmaceutical Society, and had not ceased to love it, although he did feel it had not done its duty in defending chemists where they needed defence. The Society was founded not only for educational purposes but to protect the rights of the trade, and he felt that that ought still to be done. If the Apothecaries' Company should succeed he hoped the Society would go to Parliament and get fresh powers. If chemists and druggists were obliged to give up anything they ought to be in a position to treat with the medical profession, that each should do that which was right, and for the good of the public.

Mr. Pond thought the resolution might be strengthened by stating more definitely the particular purpose for which it was required. They wanted £2000 for a special purpose, not £2000 to be constantly in hand.

Mr. Reynolds (Leeds) suggested that the resolution should be altered so as to read that a special effort be made to raise at least £2000 by donations. He could quite feel there was a good and sufficient reason for increasing the sinews of war, because it did not seem they were likely to have an entirely peaceful life. He had in his pocket a Leeds newspaper which showed the latest doings of the gentlemen alluded to in the Selby case. He had taken under his protection the staff of life, and had the usual alum on the brain which every young analyst generally commenced with. The case had been tried before the Selby magistrates, and Mr. Allen having caused the prosecution of some highly respectable millers for having added alum to their flour, the case had been adjourned once, and the decision was now given after the opinion of three analysts at Somerset House had been taken. Their opinion entirely disproved Mr. Allen's statement, and proved there was no alum whatever in the bread, and that the whole blunder arose from there being a little alumina derived from the clay in the Egyptian wheat, a thing which he might be excused for saying he exposed in the *Pharmaceutical Journal* at least fifteen years ago. That periodical was probably not exalted enough to come under the notice of gentlemen like analysts, but at any rate chemists and druggists, if they were entrusted with duties of public analysts, would not make these blunders. He would suggest that the next time the Food and Drugs Adulteration Act came up for its periodical revision—for it seemed to be a standing dish with the House of Commons—there should be a clause introduced which should protect the public against adulterated chemistry, and that there should be some remedy provided by the Act against the gross ignorance or carelessness of analysts which subjected innocent persons to prosecution. He was glad to support their proposal for increased strength being given to the executive, because it was evident that their expenses during the present year were not likely to be much less than they had been before.

Mr. Vizer (Brighton) quite endorsed Mr. Reynolds's remarks. He had a great objection to raising special funds for special objects in connection with an association of that kind, because it divided the work unnecessarily. He was quite certain that if the whole trade were canvassed it would respond to the appeal. The Association had a large general committee, and if the members of that committee were to canvass each in their respective neighbourhoods, he had no doubt there would be no difficulty in raising the £2000 required.

Mr. Preston felt sure they were all of one mind with regard to the necessity of supporting the executive in the future; the only difference of opinion was as to the best mode of doing so. From the observations which had been let fall as to the prosecution in Shepperley's case being abandoned, many persons might consider that it was not certain that a large sum would be required in the ensuing year, but it was quite clear that things might arise which would require efforts on the part of the executive and require it to be able to put its hands on funds if necessary. It would seem to him, therefore, to meet the case better if a guarantee fund were proposed without mentioning any particular object for which it should be raised. The meaning of that would be that the whole number who put down their names would be responsible *pro ratâ*, according to their subscriptions, if called upon for any particular purpose. Their guarantee might be spread over a number of years, and that would strengthen the hands of the executive far more than even raising

£2000 at once which they did not know would be suffi- for the work to be done. He had seen this plan carried out in several societies and it had always succeeded.

Mr. Chipperfield objected to this last suggestion. He had never but once put his name down to a guarantee fund, and should never do so again. Life was short, and they might guarantee to pay a sum of money during the next ten years, and a great many of them might depart from the scene before that time. He understood Mr. Barclay to say that if a similar response were made now to that made at the commencement of the Association it would suffice for what might be required. He thought all the members of the trade should have it put very plainly before them, that it was their duty to do their utmost in this matter. Mr. Barclay seemed to think that they were to look forward to those who had generously responded before to do so again, but on looking down the list he thought there were many other people who ought to respond to such an appeal. There might be generously disposed persons who would out of their wealth respond a second time, but this battle was to be fought mainly for those who had a difficulty perhaps in making response to such applications. Those gentlemen who had before put down their names for £20, £5, and so on, were mostly engaged in businesses where they were little likely to be attacked; it was those in the lower ranks of the trade who were more likely to be prosecuted. It had been said that if the subscriptions were increased to 7*s.* 6*d.* the total amount received would not be so much, which he was sorry to hear, because he thought there could be scarcely anybody so poor who could not afford to pay 7*s.* 6*d.* in twelve months. He was not going to urge that that should be done, but simply that every member of the trade should be appealed to to support the Association as far as his means would allow, and if that were done he was quite sure they would have ample funds. It was said that gentlemen should canvass in their immediate neighbourhoods, but that would practically come to canvassing their own towns only, and that led him to suggest that as far as possible the general committee should embrace representatives from a larger number of separate towns.

Mr. Pollard (Ryde) thought it was quite possible for any member of the committee to put himself in communication with his fellow members in the trade in contiguous towns, so that canvassing might be made effectual. At the same time he thought it essential that they should have some definite information to put forward. There was an old proverb that a fool and his money were soon parted, but he thought there were very few fools amongst chemists, and he very much doubted if that body would grant a financial vote of credit. They would say, "What do you want it for?" and they would not give it for general purposes. When they went canvassing they would have to say there was some particular end in view, or else the money would not be raised.

Mr. Dean (Bow) did not think the matter need be placed in the hands of the committee if each member of the Association would do what he could towards increasing the number of subscribers. He could not conceive of any man of business being so foolish as not to want to part with five shillings when he considered what was done for it. They found many people in the trade subscribed to the higher society, if he might call it so, and paid their one guinea; for what, he did not know, and had never been able to learn. But this Association did its work wonderfully cheap, at least half as cheap as could be expected, and many of those who did not subscribe at present, if they only had some troublesome person coming into their shop and raising a difficulty, would soon hurry off to their friends at Birmingham and ask them to take the matter up. He did not see why there should be any antagonism between the Association and the Pharmaceutical Society, and he was sorry to see there had been anything of that sort either in articles or letters. He believed if the Pharmaceutical Society had taken up the position that the Association had it would have been supported even at a guinea subscription. He, for one, should have been glad to do so if it had gone in for their trade interests, and not so much for that very interesting matter which they saw in the early pages of the *Pharmaceutical Journal*; it was very learned but not very interesting to most people who had to do with making up pills and mixtures. With regard to the Dental Practitioners Bill, he had been in business for thirteen or fourteen years and had attained some little success in teeth extracting and matters of that kind. He did not set himself up as a dentist, but he thought they ought to be left alone in these simple matters. He wished to ask the committee if they thought it was safe for a person in his position not to go in for the full qualifications of a dentist, but to let the matter rest as it was. If Sir John Lubbock carried out what he said, that he did not intend the Bill to apply to those who only extracted teeth, then his position would be safe; but a promise was one thing, and an Act of Parliament was another. A great many chemists at the East End did the same thing, and he did not think they were overstepping their duties in so doing. He did not agree with the guarantee fund, but thought they should do their utmost to strengthen the general funds of the Association.

The President, in reply to the last speaker, read a portion of the reply of Sir John Lubbock to the deputation which waited upon him, showing it was not the intention of the Bill to interfere with teeth extracting or stopping. He did not think the Bill had yet been committed, but it would be carefully watched.

Mr. Dean said he should be satisfied to leave the matter in the hands of the executive.

Mr. Lenty said he had subscribed five shillings simply because he did not know there was any need for anything further, but as it had been stated that it was necessary that more funds should be raised he should have no objection to subscribe one guinea a year, and would take upon himself to canvass his own neighbourhood, and had no doubt he should meet with a ready response.

Mr. G. H. Wright remarked that sometimes they heard gentlemen say that they did not prescribe and objected to it; he had been for many years connected with a large business in London, and he never knew a day in which all their assistants did not prescribe. If a person came in and bought an ounce of castor oil and asked how much was a dose, if they gave the information required that was prescribing—in fact, every one prescribed. If anything were to happen which would put a stop to this, the whole business would fall, and it must necessarily greatly affect the interests of the wholesale druggists, and therefore he thought they might fairly look to those gentlemen for their £50 subscriptions to assist them, seeing that they were the persons who would really be affected. One gentlemen said he thought there were very few fools amongst the chemists, but he must say he had sometimes doubted whether he had not been a fool for being one, and all the more when he saw what a disposition there was to enforce pains and penalties upon them. He did not, however, see that there was any necessity for passing resolutions of the kind proposed. If every gentleman in the room would put down a guinea no one would oppose it, and if ever they did get into a difficulty he was sure their friends, the wholesale druggists, would come forward and help them out of it.

Mr. Postans hoped whatever steps the Association might take would be with a view of acting in the greatest possible harmony with the Council of the Pharmaceutical Society. He thought not only had this Association great cause for congratulation, but that those members who promoted its formation were entitled to especial credit, especially as it appeared to him that the amount of work done by the Pharmaceutical Society in defence of the trade during the time the Association had been in existence had not been equal to that which it had done. The Pharmaceutical Society was an educational body, and there were many matters which it was very difficult for such a body to take up. This Association, therefore, was just the sort of thing which was wanted. His idea of a Pharmaceutical Society was that it should grow up like a tree sheltering all sorts of societies under its branches, and those branches could not but help to support the mother stem. The question before the meeting was how this amount was to be raised which the executive said was required for the carrying on of what was unquestionably a test case. Various propositions had been made, and he thought men as a rule would support and subscribe to special objects when they would not in other ways, and if an application were made he had no doubt the money would be raised, but he should object to increasing the annual subscription.

Mr. Haffenden (Brighton) said they surely were not so poor that they need go to the wholesale houses for assistance. Any matter affecting themselves as a body they should all feel was of such vital importance as to be always ready to find the necessary money.

Mr. Barclay remarked that he believed they could undertake a great many things which the Pharmaceutical Society could not well do, and there should not be the slightest antagonism between the two bodies. He, for one, should not have taken any part in the formation of that organization if he thought he was going in any way to damage its *prestige*. He thought the action of the Society the other day in prosecuting the London and Provincial Association, would have been done much better by the Trade Association. The Pharmaceutical Society could hardly take up a case in which it ran any risk of failure, and if it did fail it was damaged in the eyes of the public. That Association ought to support the Pharmaceutical Society, and work hand in hand with it, and now that the Pharmaceutical Society had committed itself to support the chemists against the Apothecaries' Company, he thought they were justified in going to it and asking for a subscription towards the Defence Fund.

Mr. Owen was glad to hear the last remark, because he felt satisfied the Council of the Pharmaceutical Society, as a body, did not deserve the censure which was sometimes passed upon it. It was quite true there were certain things which it could not so well do as that Association.

The resolution was then put, and carried unanimously in the following form :—"That a special effort be made to raise at least £2000 by donations, to be used in protecting and furthering the legitimate interests of chemists and druggists."

Mr. Thornton (Bradford) said it had been suggested that the prosecution in Shepperley's case would not be proceeded with, and he thought this was very possible if the Apothecaries' Company thought that by delaying it, those gentlemen would be removed by death, who would be able now to give evidence, and thus they would have a better chance of succeeding. It would be, however, for the executive to compel them to go on. Then when they had once got rid of an invading army, the next thing was to prevent their coming again, and he begged leave to propose a resolution, pledging the executive committee to support the Medical Act Amendment Bill, and to memoralize His Grace the Duke of Richmond to persist in his efforts to repeal those clauses in the Apothecaries Act bearing on the profession or trade of chemists and druggists. The Duke of Richmond seemed determined to do this if he were supported, but there was a strong pressure brought to bear upon him from the other side, and therefore it was necessary for them to bring what influence they could to bear in support of it.

Mr. Cotterell (Dover) thought the best course would be, instead of wasting time in defending these cases, to get an Act of Parliament establishing their rights, and preventing any one being prosecuted for doing that which had been done previous to 1815.

The President suggested that the latter portion of Mr. Thornton's resolution should be omitted, leaving it more general.

Mr. Owen thought it was unnecessary to pass such a resolution, since the whole work of the executive from the commencement had been to the effect now proposed.

The President suggested that the matter should be left in the hands of the executive to watch the Bill, and not to allow the clause referred to to be withdrawn if it could be prevented.

Mr. Thornton said that was all he wanted, and he would therefore not press the resolution.

Mr. Preston then moved, and Mr. Jones seconded, and it was carried unanimously, that the list of names submitted by the general committee, be elected as the executive committee for the ensuing year.

The President said the next business was to elect officers.

Mr. Owen asked if this could not be done without balloting.

Mr. Reynolds suggested that they should follow the American plan, which was to pass a resolution deputing some one gentleman to deposit a ballot on behalf of the meeting, which would save all the trouble. He would move that Mr. Owen be requested to do so. This was seconded and carried unanimously, and the ballot being taken in this way the President, Vice-President, Treasurer and Honorary Secretary, were re-elected.

The President, having briefly returned thanks for himself and colleagues, said it was suggested that the next election of the general committee should take place in April, 1880.

Mr. Fairlie (Glasgow) remarked that the election was an expensive affair, and he would therefore move, as suggested, that the next election should take place in April, 1880.

Mr. Bell (Hull) seconded the motion, which was carried unanimously.

A vote of thanks to the President for presiding was then passed unanimously, which terminated the proceedings.

Donations to the amount of over fifty guineas, were announced by the Secretary before the meeting separated.

LIVERPOOL CHEMISTS' ASSOCIATION.

The fourteenth and concluding general meeting was held at the Royal Institution, May 2, 1878. The President, Mr. T. Fell Abraham, in the chair.

The minutes of the previous meeting were read and confirmed.

The donations to the library were duly acknowledged.

Messrs. J. H. Jones and J. B. Kershaw were unanimously elected members.

Two phonographs were exhibited, one belonging to Mr. C. H. Stearn, the other to Dr. Symes. Their construction, mode of action, and the practical difficulties found in working them were explained and pointed out by their owners. Numerous experiments, attended with various degrees of success were made, and the thanks of the meeting accorded to the exhibitors.

Charles Symes, Ph.D., read the following paper on

Microscopic Germs in Pharmacy.

In using the term microscopic, I do not wish to convey an impression that we are dealing with organisms which necessarily require the aid of the microscope for their detection or that the microscope is capable of thoroughly defining them in their entirety. I use it rather in a general sense as expressive of minuteness. When, however, we contemplate that the atmosphere in which we live is pregnant with these organisms, carrying them hither and thither, ready to deposit them wherever a suitable soil is found for their development, be that amongst the squalid masses of narrow streets, in the overcrowded and badly drained houses of the poor, or the mansions of the opulent, amongst the flocks, herds, and crops of the agriculturist, or in the laboratory and store room of the pharmacist, when, I say, we contemplate this, we find their vastness is equal to their minuteness. Time will not permit me to enlarge on the merits and demerits of what is known as the "germ theory," but for the sake of those who have not given the matter special attention, I may say it is one which has furnished matter for speculation and experiment amongst the most profound philosophers of the past and present ages, and is closely interwoven with that great problem "the origin of life." Some of the early schools of reasoners went so far as to answer that the lower forms of insect and reptile life, and indeed some of the higher, sprang suddenly into existence, being formed from the materials in or on which they were found; subsequently their views were confined to the more minute forms of life. These were followed by others who held that no creation of life had taken place since an early period in the world's history, and that all existing life was produced from a parent or germ. The doctrine of the former is known as that of "spontaneous generation," or heterogenesis, whilst that of the latter as the "germ theory," or homogenesis. In this country and at the present day the leading advocate of the former is Dr. Charlton Bastian, and of the latter, Professor Tyndall, who, following in the footsteps of Pasteur, and aided by other workers, has succeeded in establishing the claims of this so thoroughly that few are to be found who will venture to doubt its correctness. I must say, however, that I cannot bring my mind to accept it as a really established fact; it has on its side a large amount of experimental evidence and some good reasoning, but looking at the matter from all points I cannot regard the germ theory as more than a possible and plausible hypothesis, holding in biology a position similar to the atomic theory in chemistry, highly useful for the comprehension and exposition of a large number of phenomena, and for veiling our ignorance of others. Those who hold this doctrine (and as I have said they are many) do not believe that the origin of life was coincident with the earth's advent, they really believe in heterogenesis, but at a very remote period. Why they should draw an imaginary line of demarcation, beyond which this could not occur, I am at a loss to understand. The arguments have been numerous on both sides. As regards experiments, my own have been few compared with Professor Tyndall's "cloud of witnesses," but I have reasoned on the experiments of others, and have been carefully observant of the phenomena calculated to throw light on this matter which have come under my notice during the last fifteen or sixteen years, with the result of leaving me still open to conviction and unwilling entirely to endorse either view on what I regard as insufficient evidence.

We are told that some of these germs are ultra-microscopic; but some of them can be seen with the unaided eye in a strong beam of light. You are all familiar with the effect of the sun shining through a keyhole or through a slit in a closed shutter, and have observed the "myriads of particles dancing merrily in the sunbeam;" these are germs, but not all, a large proportion consists of organic matter and organic *débris* in which life has become extinct. Strain out these particles, and you have a moteless or protected atmosphere, in which it is believed no life is capable of developing. If I pass a ray of light across the room from this lantern the floating particles are at once revealed. We can burn them up by the heat of a spirit lamp, or placing this glass vessel in the track of the beam, and exhausting it of the mote-laden atmosphere, admitting such only as is strained through this packing of cotton-wool, we get in each case darkness as evidence of the absence of solid particles. If, instead of exhausting this vessel, we had allowed it to stand a few days unmoved and closed, the same effect as regards the beam of light would have been obtained by subsidence. Professor Tyndall in most of his experiments smeared the inside of his cases with glycerine, so that when these particles had subsided they could not again rise. Now it is the dropping of these atmospheric motes into organic and indeed inorganic solutions, which brings about one class of changes in these bodies. I say one class, because we have others acting independently of any recognized form of life, a class of changes which are considered to be purely chemical or physical.

If, for example, I take these two white powders, place them on a sheet of paper, and mix them with a spatula, they almost instantly assume a bright scarlet colour; their action on light has become changed, their chemical constitution has changed also; but it does not obtain in the present day that this has anything to do with vitality. Change under the influence of germs is slower than this, and differs somewhat in character; respecting its beginnings, however, very little is known. Our townsman, Mr. Dallinger, in conjunction with Dr. Drysdale, has done very useful work in this direction, by tracing out the life history of the monad, by series of continuous observations, the whole extending over several years. Independent of this, bacteria in a fully developed form is the only positively vital condition in which we know anything of germs; in other words, here is an entity, an existence. A source is implied; we find these floating particles, and by a train of reasoning and experiment connect the two; missing links in the chain will be obvious, and it is these which give room for doubt. Professor Lister, who is constantly operating, one might say, in living demonstration of his belief in the germ theory, says (*Brit. Med. Journ.*, Dec. 22, 1877): "There never has been evidence of any ultra-microscopic germ. For my own part, I think it extremely improbable that bacteria in general have any germs. They are actual reproductive organs, constantly multiplied by segmentation, and if there be any organism in existence which does not require germs, I should say it is the bacterium. I have never yet found any organism which resisted the temperature of 210° F. for half an hour." Be it observed the professor regards the bacterium as its own germ, or, at least, requiring no lower or more minute form for its reproduction. Professor Tyndall assuming the existence of ultra-microscopic spores or germs of bacteria, says that, although a temperature of 150° is sufficient to destroy fully developed bacteria in a liquid, these germs will retain vitality after five hours' boiling. Mr. Dallinger, assuming they exist, says they will bear a temperature of 300° F. and remain fertile. Again, Mr. Willmott, in a paper read before the British Pharmaceutical Conference last year, stated as the result of a large number of experiments, that in the moist state a continued temperature of 150° was sufficient to kill both bacteria and spores, and to render the liquid sterile, and that boiling, except in some instances, was quite unnecessary for the purpose.

To us, as pharmacists, it matters little perhaps what theories (as such) obtain, but it is of considerable importance how and under what conditions we can best preserve such pharmaceutical preparations as are prone to decay or fermentive change. What avails it that we select the best of materials, use the most approved of modern appliances, and operate with the skill of the adept, in producing medicinal agents, if when they are required for use sufficient change has taken place in their constitution as to admit of a question as to whether they have lost anything of their activity by age?

The liquids chiefly experimented on by scientific inquirers have been infusions, and it is amongst this class of medicinal preparations that the pharmacist meets one of his first difficulties in combating germs. One way of surmounting this is the use of concentrated infusions, containing a large percentage of spirit, and although this is better than using an infusion which has been kept till in an incipient state of change, it certainly cannot compare with the recent infusion as ordered in the Pharmacopœia. Another method consists in the exclusion of air, *ergo*, the floating particles which it contains. The first notice of this method I find in vol. i. of the *Pharma-*

ceutical Journal, 1842, in a paper on "Decoctions and Infusions," by Mr. Jacob Bell, where he quotes a paper by Mr. Alsop, written in 1836, which for want of a suitable periodical in which to publish it in this country, was sent to the *American Journal of Pharmacy*. It consists of filling bottles, say of four, six, or eight ounce capacity, with freshly strained infusions, placing these bottles in a vessel of water, heating up to the boiling point, continuing the ebullition for a few minutes, corking so as to have but a small air space between the cork or stopper and the surface of the liquid, and carefully sealing, so as to prevent completely the access of air.

Infusions so preserved will retain their medicinal properties for months, or even a year or two. Here are some which have been kept more than a year. Lemon juice might be preserved in the same way, but heating to the boiling point injures the flavour, and in 1863 I made some experiments to ascertain the lowest temperature to which it could be heated and satisfactorily preserved. The result of these experiments I published in the *Pharmaceutical Journal*, vol. v., 2nd series, in a short paper on "Lemon Juice and its Preservation." The experiments were made in the winter, and a temperature of 150° was found quite sufficient for the purpose, and the juice retained much of its fresh flavour after being kept about nine or ten months. The experiments repeated in the summer (using the same temperature) were not so successful; but this might arise from different causes: the lemons would be fresh in the winter, the atmosphere in a more moteless condition; but whatever was the cause of difference, the fact remains that I found a temperature of 150° continued for some little time, sufficient to preserve a number of specimens of the juice, and in these instances proved equally efficient to boiling, which fact has been rediscovered quite recently, and considerable importance attached thereto. The addition of certain antiseptics has been recommended from time to time, and amongst them chloroform. This is usually effectual and might be used in hospital dispensing with the sanction of the medical men; but its use in the pharmacy is inadmissible. It effectually prevents the development of bacteria, but at our last meeting I showed a fungoid growth which had developed in aq. chloroformi of the B.P. The addition of glycerine to fluid extracts and other preparations of the kind, instead of alcohol, has been largely advocated in America; but my experience is not favourable to its excessive use. Indeed I might safely say that the next edition of the U. S. Pharmacopœia will contain less glycerine in its preparations than the last. Extracts are also subject to the attacks of germ life, usually those which develop as fungoid growth. The presence of moisture facilitates this, and it might be said in general terms that the greater the concentration or dryness of the extract the less prone will it be to this form of decay.

But competition in price amongst rival manufacturers tends to produce extracts containing an undue amount of moisture, their keeping qualities being thus endangered; therefore, where extracts can be obtained in powder without prejudice to their medicinal efficacy, this is undoubtedly the best form. But in other cases, where it is undesirable to carry the desiccation thus far, I can recommend the addition of a small quantity of glycerine towards the end of the process of evaporation, which latter should be continued until the finished product when cold, is of a firm pilular consistence. If too much glycerine is added it renders the extract hygroscopic but with only just sufficient to retain the pilular character it merely replaces an equivalent bulk of water, and replacing that water with an antiseptic agent, otherwise harmless, we get a better preparation and one which proves an unsuitable soil for the development of organic life. The latter remarks apply equally to confections where they are required to be kept for a long time in a moist state. Syrups are also subject to fermentative change, but with these I have already dealt in a paper read before the British Pharmaceutical Conference last year.

The paper was illustrated by numerous experiments, and at its conclusion a cordial vote of thanks to the author was carried by loud acclamation.

The President delivered the following address—

Gentlemen,—This meeting is the fourteenth and last general meeting of the twenty-ninth session of our Association, and it now becomes my duty to deliver up to you the charge committed to me twelve months ago.

It has been the practice in some recent years for this meeting to be occupied in great measure with a valedictory address from the president, but I felt very strongly that in my own case it would be a custom "more honoured in the breach than the observance."

I felt that I had nothing to say of interest but such matters as belong more properly to the report of the Society for the session.

I cannot, however, allow the opportunity to pass without, in the first place, thanking those gentlemen who have done us the favour of reading papers for their very valuable assistance. The papers read this session have been exclusively contributed by members of our Association, and it may fairly, I think, be considered a subject of congratulation that the interest of our meetings should have been sustained from internal resources.

To those gentlemen also who by their miscellaneous communications have added to our general store of knowledge, our thanks are also due.

The numerical progress of our Association has been good, twenty-one new names having been added to our roll.

In conclusion I have only to thank the members generally for the uniform kindness and indulgence with which they have received my humble endeavours to forward the interests and aim of our society.

The ballot of the meeting for the President-elect for session 1878-9 was taken, and resulted in the re-election of the retiring president.

ABERDEEN SOCIETY OF CHEMISTS AND DRUGGISTS.

The last lecture for the season of the Aberdeen Society, was delivered on Thursday, May 2, by Mr. Strachan, Secretary of the Society, in the Hall, St. Nicolas Lane. Mr. Sinclair occupied the chair. The subject of the lecture was "The Origin and Progress of the Pharmaceutical Society," which the lecturer traced in a very interesting sketch for several years, embodying in his narrative of the Society's career, brief biographical sketches of the various pharmacists who figured most prominently in its formation and establishment.

LEEDS CHEMISTS' ASSOCIATION.

The sixth general meeting of this Association for the present session, was held on Wednesday evening, April 17, the president, Mr. Jefferson, occupying the chair, when a discussion took place on "The Utility or otherwise of Provincial Chemists' Associations." The subject was introduced by Mr. Edwin Yewdall in the affirmative. In the discussion, however, which followed, the course turned not so much upon the merits of these associations in general, as upon the work being done by this one in particular. The result was a unanimous expression of opinion that the Association was fairly entitled to the sympathy and support of the trade of the district for the educational work it was doing, as also for the sake of its library, and its forming a central focus of organization.

The seventh and last meeting of the session and the fifteenth annual meeting of the Association was held in the library on Tuesday afternoon, May 14, at 3 o'clock, Mr. Jefferson again occupying the chair.

The minutes of the previous meeting having been confirmed, the annual report was read by the Secretary.

It stated that there had been an increase in the numbe of members on the previous year of one, and a net decrease in the number of associates of five, two having given up their connection with the Association, and seven left the town, whilst only four fresh ones had been added. Notwithstanding this slight falling off in numbers, the financial condition of the Association was really better than when the last report was presented; the balance in hand being £6 in excess of that of last year.

The library had been supplied with the usual periodicals, as also with the calendar, the register, and one copy weekly of the Journal, presented by the Council of the Pharmaceutical Society; and with the 'Year-Book of Pharmacy,' presented by the Executive Committee of the Pharmaceutical Conference; to both which bodies the thanks of the Association were due. Owing to want of space, only two new works had been added to the library, namely, Griffin's 'Chemical Handicraft,' and Bentley's 'Botany,' latest edition; but it was suggested that the state of the funds would probably induce the new committee to provide increased book accommodation.

Arrangements had been made for having the materia medica cabinet supplied with specimens of new remedies, and the curator was then employed in carrying them into effect.

During the winter months the room of the Association had had a fire lighted in it each evening, at 7 o'clock, for the comfort of such members or associates as might wish to make use of it, and it was gratifying to find that it had to some extent been appreciated.

The educational arrangements for the previous year consisted of the admission of the associates to Mr. Ward's classes on Chemistry at the Mechanics' Institute, on the same terms as members of that institution, nine availing themselves of the opportunity; and of a class on Materia Medica, conducted by Mr. Abbott and attended by six students.

The general meetings held during the past session, of which that was the seventh and last, were:—

The first was held in the Assembly Room of the Queen's Hotel, when a tea was provided, open to the whole trade by 2*s.* 6*d.* tickets, followed by addresses from the President and other gentlemen. At the second a paper on "Colour and its Lessons" was read by Mr. Henry Pocklington, F.R.M.S. The third was occupied by a paper on "Spontaneous Combustion and the Causes of Fires," with experiments, by Mr. Thomas Fairley, F.C.S. At the fourth a paper on "The Geographical Distribution of Plants" was read by Professor L. C. Miall, F.G.S. The fifth: A lecture entitled "The History of a Loaf of Bread," by Mr. E. O. Brown. The sixth: A discussion on the utility or otherwise of Provincial Chemists' Associations.

During the year there had been no burning questions to call into activity the energies of the Association, but had the occasion arisen its voice would no doubt as heretofore have been heard in the discussion and settlement of any question bearing upon the well-being of the trade. Finally the committee appealed to those present and to all connected with pharmacy in the district to give the Association increased personal as well as pecuniary support, so that its future career might be one of much greater usefulness.

The adoption of the report was moved by Mr. George Ward, F.C.S., seconded by Mr. James Abbott, and carried.

The election by ballot of officers and a committee for the ensuing year was then proceeded with and resulted as follows:—President: Mr. Peter Jefferson; Vice-President: Mr. Richard Pick; Treasurer: Mr. John Land; Secretary *pro tem.*: Mr. Samuel Taylor; Committee: Messrs. Edward Brown, John Hellowell, Edwin Yewdall, T. B. Stead, Richard Reynolds and J. A. Hirst; Auditors: Messrs. Freshfield Reynolds and James Abbott.

A vote of thanks to the officers and committee of the past year was proposed by Mr. Longley, seconded by Mr. Ward, and carried.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The usual monthly meeting of this Association was held at Britannia Chambers, Pelham Street, on Monday, May 6, the chair being occupied by the Vice-President, Mr. R. Fitzhugh, F.C.S. There was a fair attendance of members and associates. After the minutes of the last meeting had been read and confirmed the Honorary Secretary (Mr. R. Jackson), announced the receipt of the following donations:—£5 5*s.* 0*d.* from Messrs. Hearon, Squire and Francis; Wills's 'Elements of Pharmacy,' from Mr. James Beardsley; 'The Calendar of the Pharmaceutical Society'; 'The Catalogue of Collection in Museum,' and *The Pharmaceutical Journal* regularly every week, from the Pharmaceutical Society. On the motion of the Chairman a hearty vote of thanks was awarded the donors. Some new members and associates were elected. The Chairman then announced that Mr. J. H. Atherton had resigned the Presidency of the Association, in consequence of leaving the town, and said the Council had presented him, before leaving, with an illuminated address as a slight recognition of the valuable services he had rendered the Association since its commencement, and evidence of the regret they felt at losing so able and energetic a President and a colleague with whom they had worked so harmoniously. He then introduced Mr. F. H. Spenser, one of the Science teachers at the Mechanics' Institute, who delivered an instructive lecture on "Electricity," illustrated with numerous and interesting experiments. The lecture was listened to with great attention, and at its close a hearty vote of thanks (proposed by Mr. R. Jackson, seconded by Mr. W. Widdowson and supported by the Chairman) was given to Mr. Spenser, and the proceedings terminated.

Parliamentary and Law Proceedings.

Supposed Death from Strychnine.

The body of a married woman, named Sarah Morris, has been disinterred at Crewe, on an order from Mr. Churton, coroner, it having transpired that there was reason to believe her death had not arisen from the cause set down in the burial certificate. It appeared that her husband on returning from his work on the morning of the 8th inst. found his wife in great agony, suffering from spasms at the heart. The doctor was called in, but on his arrival the woman was about breathing her last. She had occasionally suffered from similar spasms. Dr. James Parker Brumwell said that when he saw the woman her lips were livid and her face in a cold, clammy sweat. The action of the heart was intermittent and laboured, and there was spasm of the intercostal muscles and spasm of the diaphragm, but there was no tetanic spasm of the muscles of the limbs whatever. Before stimulants could be administered the woman died. He judged it to be a case of spasm of the heart, and the history of the case was that she had had the same thing before. He gave a certificate—*angina pectoris.* On making the *post mortem* examination, however, he found evidence of strychnine in the stomach such as left no doubt whatever that that was the real cause of death. Had there been spasm of the limbs he might have suspected strychnine, but there was not. The coroner was unable to elicit that there had been anything irregular in the woman's habits of living, the evidence being to the effect that she was very temperate; but it transpired that she had contracted a number of debts unknown to her husband, and had been in the habit of pawning his clothes. It was proved that deceased had purchased two-pennyworth of a vermin-killer whose principal ingredient was strychnine, from the shop of Mr. M'Neill, chemist, the day before her death, and the jury returned a verdict that deceased had died from the effect of strychnine administered by herself, but that there was no evidence to show in what state of mind she was at the time.—*Liverpool Post.*

A Curious Defence.

A case was heard in the County Court, Lime Street, Liverpool, on Monday, May 13, before Mr. J. F. Collier, judge, in which Mr. James Taylor, described as a chemist, carrying on business in South Street, sued Dr. E. Hughes, of Church Road, Walton, for £1 17*s.* 11*d.* the amount of a bill for drugs. The plaintiff, on examination, said the drugs were sold by his manager, by whom the business was conducted. The defendant disputed the claim on the ground that the plaintiff was not a licensed chemist under the provisions of the Pharmacy Act of 1868, which declared it unlawful for any person not a registered chemist to keep a shop open for the sale of such articles as those which formed the subject of the action.

The plaintiff, in reply to his Honour, said he was not a registered chemist, but his manager was. The shop had belonged to his son, now dead, and on the son's death he took out letters of administration.

Some discussion took place as to the legality of the plaintiff's continuing the business longer than was necessary to administer the estate, and his Honour adjourned the case to Tuesday next in order that the letters of administration should be produced.—*Liverpool Daily Post.*

The Alleged Adulteration of Flour at Selby.

The adjourned hearing of summonses against Messrs. John Croysdale and Sons, flour millers, for having sold flour alleged to be adulterated with alum, took place at the Selby Petty Sessions on Monday, May 13, before Mr. B. Hemsworth (chairman), Mr. W. T. Smith, and Mr. J. Adams.

Mr. Cadman, for the defendants, said that at the previous hearing of the case, in the course of conversation with respect to the report from Somerset House, it was stated by one of the magistrates that if Mr. Allen's certificate had been sent to the analysts there they would have used the word alum distinctly instead of alumina.

Mr. Smith remarked that what he said was that Mr. Allen's certificate had not been sent to the analysts at Somerset House, or they might have used another name.

Mr. Cadman said that at any rate the gentlemen engaged in the prosecution of this case had not the common honesty to tell them that a copy of Mr. Allen's certificate had been sent to the authorities at Somerset House, and he now asked for the letter that was sent to be read.

Mr. Hemsworth deprecated any imputation against the prosecution, as he was sure that Superintendent Gill had no feeling against the defendants.

Mr. Cadman: I ask again, was a copy of Mr. Allen's certificate sent to Somerset House?

Superintendent Gill: Undoubtedly, in accordance with a letter which I will read to you.

Mr. Cadman said that at the former hearing it was certainly the impression of the Bench that merely a sample of the flour was sent to London, with a request to the authorities there to make a report on it. Now it seemed that a sample had been sent, together with the report of Mr. Allen. The authorities at Somerset House were either to corroborate Mr. Allen's report or repudiate it, and they said, "The results of our experiments do not enable us to confirm that it (the alumina) exists in the form of alum." He wished to know whether a letter had been received from Somerset House since Monday last.

Superintendent Gill said that he had got a letter on the previous day. He explained that he had sent to Somerset House particulars of Mr. Allen's analysis, in accordance with a request from the analysts there. Since the last hearing he also sent the following letter to Somerset House:—

"In reference to the samples of flour sent up to Somerset House for analysis on the 22nd ult., and your certificate relating to sample No. 30, which states that you cannot confirm that the alumina exists in No. 30 flour in the form of alum, etc., the Justices for the West Riding of Yorkshire acting in this division desire me to request that you would be good enough to say whether the sample did or did not contain alum, or whether you decline to express an opinion on the point; also whether you had sufficient quantity of the flour for examination."

To that he received the following reply:—

"With reference to the preceding letter, we have to state—First, we are of opinion that the samples did not contain alum, and we intended this to be understood by the terms of our certificate. Second. Both samples were very limited in quantity, that marked No. 30 barely weighing five ounces. Although we were enabled with the quantity at our disposal to prove by duplicate experiments the presence of an excess of alumina in No. 30, and to satisfy ourselves of the absence of alum in both samples, it would have been more satisfactory to us to have had a larger quantity, that we might have been able to determine and state in our certificate in what form the excess of alumina existed in No. 30 flour.—(Signed) J. Bell, R. Bannister, and H. J. Helm."

Mr. Cadman said that the defendants had been brought into court to answer a charge of adulterating their flour with alum, and the analysts at Somerset Hourse had certified that there was no alum present in it. That being so, was it necessary longer to take up the time of the Court? The defendants would not have been charged, but for a mistake on the part of Mr. Allen, and because of an inaccuracy in his tests of analysis.

Mr. Smith thought they should hear further evidence. It seemed to him as if the analysts at Somerset House were persons who were not chemists, and were simply creating confusion. He thought, on the other hand, that Mr. Allen had given his evidence in a proper and straightforward manner.

Mr. Cadman asked again if the Bench insisted that the case should go on.

Mr. Smith said that they were bound to hear the case out.

The cross-examination of Mr. Allen, the analyst, by Mr. Cadman, was then resumed. He stated that he first tested the bread he had made from the sample of flour sent to him by the logwood test, which told him that there was something wrong with the flour. Having found this, he then ascertained the amount of alumina it contained by a process he had already described.

Mr. Cadman: To put it shortly, you found something wrong by one test; by another test you found what you call an excess of alumina, and then you put the two together and calculated alum. Is that so?—Yes.

Mr. Cadman: Did you by any process you used find one speck or tittle of alum as alum?—No, nor nobody else. Nobody ever found alum in bread as such.

Mr. Hemsworth: You say there is an excess of alumina in the flour, and that it exists in the form of alum?—Yes. I believe it exists in the form of alum.

Mr. Hemsworth: The analysts at Somerset House agree as to the alumina, but they don't say in what form it is. We want to know their opinion as to what that excess is. There is a property in the flour which ought not to be in it.

Mr. Cadman: Which is capable of explanation. But what the prosecution had to make out was that the flour was adulterated with alum—pure and simple, if the phrase might be allowed. The defendants said that there was no alum in their flour.

Mr. Hemsworth: There is an excess of alumina which has not been found before.

Mr. Cadman: Because I don't think there is a place in the country capable of grinding flour as this is ground. That excess of alumina might arise from the process of manufacture, and that being so, under the words of the section the defendants cannot be convicted. They had heard that Egyptian wheat was very dirty. Well, the defendants had special machinery for scrubbing and washing the wheat. They brushed it to take off every bit of clay, but if any specks remained it might be sufficient to account for the presence of alumina.

Mr. Richard Bannister, one of the analysts at Somerset House, was then called by Mr. Cadman, at the request of the Bench. His evidence was to the effect that the result of his and his colleagues' analysis of the flour was the same as Mr. Allen's, but they came to different conclusions as to the excess of alumina. Mr. Allen said it existed in the form of alum, but they found that it was not alum.

Mr. Hemsworth: Then what is it?—I am sorry I cannot tell you.

But there is something in the flour that ought not to be?—There is more alumina, but it may come from clay of dirt, or something which we are unable to say.

Mr. Cadman reminded the Bench that the question before them was alum or no alum. They could not go beyond the information to prove something else.

Mr. Allen, in answer to the Bench, said he still maintained his belief that there was alum present in the flour. At the same time Mr. Bannister was quite justified in what he had said, because he had failed to get the precise result which he (Mr. Allen) got. He had the authority of Dr. Hassall that the test used sometimes failed.

Mr. Bannister said that at the time they tested the samples sent to them they also tested 20 other samples of what they knew to be pure flour, and the result in all the cases was the same. They then added alum to some samples, and the test showed when the alum was present; so that he thought they were justified in concluding that the test was a good one.

After this evidence, the magistrates retired and consulted, and on their returning into court,

Mr. Hemsworth said that they had thought the matter over, and found the evidence so conflicting that they had decided to dismiss the information.

Mr. Cadman said that had the Bench not thought it right to dismiss the charge at that point, he would have called witnesses to prove that it was impossible for a miller to put alum into the flour.

Mr. Hemsworth: Let us say no more about it.

Mr. Cadman applied for costs, but the Bench would make no order.—*Leeds Mercury.*

Important Appeal Case under the Sale of Food and Drugs Act.

On Saturday, May 18, the argument in the case Rook *v.* Hopley, which raises an important point under the sale of Food and Drugs Act (38 and 39 Vict. c. 63), and was part heard some time ago, was resumed and concluded in the Exchequer Division of the High Court of Justice, before the Lord Chief Baron and Baron Pollock, sitting in banco.

Mr. J. Brown, Q.C. (with whom was Mr. Sutton), argued for the appellant; Mr. Ambrose, Q.C., appeared for the respondent.

It was an appeal from the decision of the Manchester Bench of Magistrates, who declined to convict the respondent, under the above Act, for selling one pound of lard, which was found, on analysis, to contain 15 per cent. of water. The lard in question was part of a larger quantity purchased by Mr. Hopley in Liverpool, with the following bought-note:—"Bought by Mr. J. Hopley, of Manchester, of W. Walker, cheesefactor, etc., Liverpool, four tins lard, No. 1;" then follows the weight. As to the figures, "No. 1," no evidence was offered, and it was admitted that they did not point to any particular lard, good or bad. Section 25 runs:—"If the defendant in any prosecution under the Act prove to the satisfaction of the Justices or the Court that he had purchased the article as the same in nature, substance, and quality as that demanded by the prosecutor, and with a written warranty to that effect, and that he had no reason to believe at the time when he sold it that the article was otherwise, and that he sold it in the same state as when he purchased it, he shall be discharged from the prosecution," etc.

Mr. Brown contended that the above bought-note was not a "written warranty" within the Act, being merely descriptive. He relied on "Chaunter *v.* Hopkins," the case of the patent fire-consuming furnace, and "Josling *v.* Kingsford," the case of oxalic acid. He was stopped by the Court before he had concluded his argument.

Mr. Ambrose submitted that he came within the exceptions of section 6. The water introduced was not a matter injurious to health, but was necessary to the manufacture or production of the article. The prosecution ought to have proved that the lard and water was not lard, and that the 15 per cent. water added was not necessary and injurious. Lard, he believed, was pigs' fat boiled down and in water.

Mr. Brown: Oh, no. I have consulted a housekeeper, and she says it is no such thing.

The Lord Chief Baron: We cannot take judicial notice of questions of chemistry.

Mr. Ambrose: The fact that the analyst has found that, in spite of the adulteration, it is still lard, is rather in my favour.

Baron Pollock: Recollect the preamble of the Act, to which Lord Coke used to attach great importance; the law regarding the sale of food and drugs is to be amended, the object being to avoid adulteration, and get pure and genuine articles.

Mr. Ambrose: It is found in the case that the article purchased was the same as that asked for, and with a written warranty. This document is not an invoice which records a debt, and is an account of goods already sold, but is to all intents and purposes a contract. The learned counsel then sought to show that the words in the note constituted a "warranty," and cited numerous cases tending that way. "Allan *v.* Lake," where, in a "sold" note about turnip seed, words of description were held to be a warranty; "Nicholls *v.* Godts," about rape oil; "Gardiner *v.* Gray," about waste silk; "Barr *v.* Gibson," a stranded ship; "Bannerman *v.* White," the hop case; "Jones *v.* Just," the jute case; "Randall *v.* Newson," and "Bowes *v.* Shand." If the statute be thus construed, he continued, it will hit perfectly innocent people, who are buying honestly, and however good the article may be.

Baron Pollock: The real question is, Will this prejudice the purchaser?

Mr. Ambrose: The Legislature only intended that the evidence of the warranty must be in writing and not verbal, to prevent shuffling excuses. It never was meant to catch honest tradesmen in a trap of this sort and render them liable to very severe pains and penalties.

Mr. Brown was not called on to reply, and

The Lord Chief Baron proceeded to deliver judgment as follows:—In my opinion the appellant is entitled to our judgment, but I come to that conclusion with very great regret, for it is a very hard case indeed. But hard cases make bad law. The respondent purchased, paid for, and sold the article in question as lard. Does he come within any of the exemptions of the Act? The analyst has found that this is adulterated lard; is that lard within the Act? As to the question whether words of description in an invoice constitute a warranty, I do not decide that now, for I may be called on to do so in the Court of Appeal at some future day, and I wish to reserve myself the liberty of deciding in either way. But in "Josling *v.* Kingsford" words of description were held not to constitute a warranty, though adulteration afforded a ground for repudiating the contract. Here the magistrates and the analyst have found that there is adulteration; and to stop that, as we gather from the preamble, is the whole object of that important, useful, and generally beneficial Act. In these circumstances our judgment must be for the appellant.

Baron Pollock: I come to the same conclusion, and I base my decision on the construction of the Act which forms the basis of the magistrates' jurisdiction. This is a very important case, and we find that the Legislature in the earlier Acts about the sale of food and drugs had required proof that the seller had himself adulterated the goods, or that he sold them knowing them to be so adulterated. (See 35 and 36 Vic., cap. 74.) Now new and more stringent provisions are introduced, and the Courts must be careful to put a proper construction on the Act and one consistent with the protection of honest dealers. The analyst is made by the statute the official person to determine the true character of the articles sold. There are exceptions which were open to the respondent to take; he might have raised defences before the analyst, as that the ingredient added was not injurious, and necessary to the manufacture; he might have asked for an analysis by the chief officer at Somerset House, or he might have appealed to Quarter Sessions. He did not avail himself of any of these. Is the thing sold prejudicial to the purchaser, and not of the nature demanded? I think both, though I do not mean that it is calculated to poison him or interfere with his health. The instrument relied on is a mere bought-note, and not an express written warranty. Mr. Ambrose, in his strenuous argument, said that lawyers were bound to infer that lard did not necessarily mean perfectly pure lard. That is not the way to construe the Act, to which we must give a full construction and one favourable to those selling the article. But it must not be by legal inference from language which is not express. The case must be remitted to the magistrates, telling them their decision is wrong, for them to fix the penalty.

Appeal allowed, with costs.—*Times.*

Dispensing Memoranda.

[78]. This can be dispensed without any separation of quinine taking place by first dissolving the citrate of iron and quinine in the aromatic spirit of ammonia and adding to it gradually the bromide of potassium, previously dissolved in the water.

G. H. B.

[107]. Hoffman's Anodyne.—I am asked why I write against Spiritus Ætheris—"called Hoffman's Anodyne"—in my 'Companion to the British Pharmacopœia.' I answer, because the mixture of ether and rectified spirit is so called in all the Pharmacopœias I am acquainted with (the United States excepted). I quote the following for reference:—

Austria, 1824, 1855, 1869.
Baden, 1841.
Belgium, 1854, 1856.
Denmark, 1869.
France, 1837, 1866.
Germany, 1872.
Italy, 1857.
Prussia, 1846, 1862.
Russia, 1840, 1871.

'Pharmacopœia Raisonée,' par N. E. Henry et G. Gibourt, published in 1828, has the following paragraph: "Aujourd'hui on entend généralement par liqueur d'Hoffmann un mélange à parties égales d'alcool à 36 degrés et d'éther bien rectifié."

'Farmacopèa Italiena Livorno, 1857':—

Liquore Anodino Dell Hoffmanno.

Alcool Rettificato a 33 Cartier . P 2.
Etere Sulfurico . . . . . . P 2.
Misce.

277, *Oxford Street, May* 11, 1877. P. Squire.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Vote for Admitting Women as Members of the Pharmaceutical Society.

Sir,—On reading your report of the Adjourned Annual Meeting of the Pharmaceutical Society, which was held on Friday last, for the purpose of receiving the report of the Scrutineers as to the election of Council for the ensuing year, a meeting at which it is generally understood that no other business will be introduced, I was much struck by the introduction of the question of the correctness of the President's declaration on the preceding Wednesday of the result of the voting on the admission of ladies to membership of our Society.

I find that some doubts had arisen, some ideas had presented themselves, in certain minds that an error had occurred. Not one of the parties mentioned had any positive recollection on the matter. According to law or usage the declaration of the numbers could not then be called in question; nevertheless on this conjectural (it is not strong enough to be called circumstantial) evidence the vote was pronounced to have been opposite to the previous declaration.

I regret, sir, that I was not present on Friday, because from my position at the table when Mr. Wade and Mr. Vizer delivered the result of their counting, I was enabled to hear distinctly that 59 was given by the former and 57 by the latter. Mr. Carteighe (who, by the way, was opposed to me in the division) confirms me precisely in this matter, and I could produce other witnessses to give similar evidence.

May 23, 1878. George W. Sandford.

Sir,—Perhaps you will allow me to say a few words through the medium of the Journal on the dilemma which the last annual meeting fell into whilst discussing and voting for the election of females as members of the Society. That it proceeded not as orderly and systematically as it might have done cannot be disputed. Myself, and perhaps a few more feeble orators, were completely quashed and unnerved by the cries of "vote, vote," and "sit down."

I was greatly astonished on my receiving the Journal, together with the report of the *Chemist and Druggist*, to find both stating that there had been a misunderstanding between the tellers and President, because before the motion was put there was a considerable time spent in endeavouring to make things perfectly plain. It was audibly mentioned that those who supported Mr. Vizer's motion should be seated on the right side from the bottom of the theatre, whilst those in favour of Mr. Wade's were to take the other side; really I think it was so plain that a child six years old could scarcely fail to recognize the side to which he belonged. When Mr. Wade, next to whom I stood, gave in his number I feel somehow certain that he called out 59, which number I think the President took down. But Mr. Vizer did not give in his number till a few seconds after, which was not called out but handed over to the President on a piece of paper, and was echoed through the crowd as being 57, which the President afterwards corroborated. To me the error, if there has been any, seems to be ridiculous in the extreme, and is rendered a great deal more so from the fact that the 57 lady-gentlemen claimed to be the most intelligent portion of the members present, which renders it hardly feasible that they should be so completely outwitted by those whom some of their speakers denominated as benighted friends. May I, in concluding, once more ask why should not the Society issue voting papers to all members, both in London and in the provinces? for I maintain that unless more than about 120 members are present it cannot be deemed a satisfactory result whichever side will be preponderant, and unless there be a far greater majority than there was on this occasion. That this is an important question no one can deny, to me it appears to be nothing less than upsetting the whole apple cart.

A Benighted Member.

48, *Great Marylebone Street, London, W., May* 20, 1878.

Sir,—Many thanks are due to Mr. Wade and Mr. Hampson for the able and honest manner in which they upheld the "right" on Wednesday last.

Much as certain "members of the Council of the Pharmaceutical Society" may oppose the admission of women (eligible for election), there seems no justice in the decision of a body of men acting in opposition to their own byelaws.

Laurel Bank, Fulham, S.W. ELIZABETH LEECH.

WHAT HAS THE SOCIETY DONE FOR US?

Sir,—It is not my custom to take part in the annual discussion on the report of the Council, which is too often a weary reiteration of puerile grumbling, ending in no practical result. I generally prefer as a silent member to listen to the sentiments of country members, and to learn from them their opinion of the Society's doings, and the state of provincial trade. This year has more than ever impressed me with the contrast between the jubilant pæan of our genial President, and the funereal dirge moaned by most of the speakers. The trade is in a death struggle, it will soon be dead; but the Council has this year saved two thousand pounds to bury its members, and the house in Bloomsbury Square will be converted into a handsome mausoleum, where future dispensers at co-operative stores may sometimes make a pilgrimage in devotion to the memory of its founder, a man who if he had one purpose more than that of educating the young members coming into the trade, it was to protect the interest of those who were already in it. This, sir, was the theme of our last gathering.

Every year the speeches of members express more and more their dissatisfaction at the apathy of the Council in all matters that concern the trade. What is the Society doing for us? is the question asked from Cornwall to Scotland. If this is the whisper of its own body, what is the feeling of the outside trade respecting its arrogating to itself to be the representative of the trade, while in the same breath it declares itself to be a private club, a voluntary association, which need not admit any one to membership if a personal prejudice exists against them, no matter what their qualifications are, and of leaving all things affecting trade interests to the Trade Association.

Without holding the pessimist views of the majority, I feel that the trade is in a very critical state, and wants a united body to enable it to stand its ground; but I consider the Pharmaceutical Society to be in a more dangerous condition, and that nothing short of a revolution will save it from perishing through the disgust of its own members, and its exclusiveness. I have very little sympathy for the children of the Society, because they have had the power to alter in their own hands, and for years refused to wield it, and are only now opening their eyes to the truth. It is for the outside men, who have no voice in the election of their governors, that I commiserate. To a certain extent they also have themselves to blame for not coming into the Society; but how can they be expected to have any desire to be associated with us when they continually hear the question, "What does the Society do for us?"

The Society lost its best chance when the Incorporation Act was passed, by not making itself popular with all, and striving with a liberal policy to bring in the whole of the outsiders. If this had been done, we might have had real representative men on the board, and the Society by this time would have been all powerful and respected, because undivided. It is not yet too late. Twice before you have permitted me to express these sentiments, and I now repeat that it would be for the advantage of the trade, as well as the Society, if the two could be brought to acknowledge the need that each has of the other.

The Pharmaceutical Society is the natural governing body and not a voluntary association, yet up to the present time it has been only a stumbling block, and worse than useless, except as an educational institution. Much as I appreciate the efforts of the Trade Association, and as an earnest member of it, I know full well the good it has already accomplished, and how much there is in store for it to undertake; but it can never occupy the place the Society is intended to hold. It must of necessity play second fiddle, and can never have the same influence.

The Society might by changing its entire policy become a powerful agent in altering the depression now settling upon the retail tradesman; it can only be done by reversing the whole of its past behaviour.

I call upon the new Council to consider the welfare of all chemists and druggists. Even to forget, for a year, that it merely represents a fraction of them, called the Pharmaceutical Society. Let it, for the next twelve months, stay its efforts to advance education, and see how much it can accomplish in support of general business. Let it forget the Society in working for the fraternity.

Then, sir, on the next May meeting we shall not have waggoners crying out to Jupiter for help, or piteously asking "What has the Society done for us?" They will be able to say our Society has now made itself representative. It has given up its old crochets and exclusiveness. It has assumed its proper position as the head and protector of the entire trade. I think the highest honour it can gain is the goodwill of the little country trader equally with the patronage of dispensers to the upper ten, and it invites every one to aid it in its worthy endeavours.

Mr. Urwick, one of the staunchest supporters and best friends the Society ever had, struck the key-stone when he suggested the reduction of the membership fee for the purpose of bringing others into the Society, and although I do not agree with this proposition, I admit this principle. I would again, as I have done before, urge the abolition of the two guinea entrance fee, for this has been an important barrier to the Society's augmentation; then, I believe, few would object to the payment of a guinea per annum, especially if the Council adopted a bold and vigorous motto.

Perish the Society for its own sake, but save the Society and trade combined.

Years ago I worked with this object in view, and I have never yet despaired of seeing it accomplished, and before I close let me, Mr. Editor, acknowledge my appreciation of the extraordinary accuracy of your reporter in reproducing the remarks I had the honour of submitting to the annual meeting on behalf of the admission of ladies to membership. JOHN WADE.

174, Warwick St., Pimlico, S.W.

J. W. L.—Mayne's 'Medical Vocabulary,' published by J. and A. Churchill, price 10*s*.

"*Sligo.*"—Apply to the Secretary at Burlington House, for a form of nomination, which will have to be signed by five or more fellows, of whom at least three must be able to certify their recommendation from personal knowledge.

Arsenicum.—You will find the information in any good manual of chemistry.

J. K.—(1) No. (2) Apply to the Secretary for a copy of the pamphlet entitled 'Hints to Students and Apprentices.' (3) The address of the College of Physicians is Pall Mall East, S.W.

E. B. Ivatts.—The term is applied to the fossil remains of an extinct genus of the class Cephalapoda. We have not been able to find a recorded analysis.

F. W. Edwards.—We are not aware that the use of salicylic acid in beer is forbidden. Whether it would be injurious to health is a question for medical authority to decide.

H. M. Hadfield.—*Acorus Calamus.*

J. Ektob.—*Barbarea vulgaris.*

"*Syrupus.*"—Probably *Brassica campestris.* Send a specimen with the root leaves.

J. W. S.—(1) Competitors must be under twenty-one years of age on the first day of July. (2) Hayward's 'Handbook of British Plants,' published by Bell and Co.; John's 'Flowers of the Field' (S.P.C.K.).

"*Amicus*" is referred to the rule respecting anonymous communications.

P. B.—(1) We do not know. (2) It has already been pointed out that an intensely fluorescent principle is yielded by suitable treatment of gelsemium root. This was named by Wormley "gelseminic acid," but by Sonnenschein it is considered to be identical with æsculin. See the present series of this Journal, vol. vi., p. 601, and vol. vii., p. 269.

W. H. Laverack.—Canning's 'Select Notes and Formulæ' is published by J. Davis, 201, Old Kent Road, S.E.

H. Glover.—Proctor's 'Lectures on Pharmacy,' published by J. and A. Churchill.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Anderson, Baillière, Vizer, Horner, Cass, Corder, Watts, Penney, Groves, Northumbria, Kilburn Chemist, Alpha, S. L., R. M., P. B., Y. J. T., P. W. C.

The Pharmaceutical Journal.

SATURDAY, JUNE 1, 1878.

LEGAL DECISIONS AFFECTING TRADE INTERESTS.

In consideration of the unusual interest attaching to the legal cases of which we publish reports this week, and the importance of the decisions in both cases, we have decided to make the ordinary matter of the Journal give place to those reports and to issue a supplement which will admit of their being accessible in full to our readers without delay.

In doing this we think that the requirements of the occasion will be best provided for without entering upon any minute consideration of the points and arguments advanced on either side. As regards the case of the co-operative stores and associations of persons trading under the Limited Liability Act, it is especially desirable to abstain from discussion in these columns, since it is probable that there may be an appeal from the decision of the County Court Judge.

The judgment in the case of the Apothecaries' Society against WIGGINS is, however, so far decisive in regard to that particular instance that there will be no impropriety in offering some remarks on certain features of the case as they bear upon the general question of counter prescribing.

In the first place we may point out that the decision of this case, though adverse to the defendant and on that account to be regretted by all who have the interest of pharmacy at heart, is at the same time so far satisfactory that it does not in the least call in question the right which chemists and druggists claim to possess by long usage and by the authority of the 28th section of the Apothecaries Act. The verdict of the jury places this fact in a very clear light, and it is, as Mr. Justice FIELD remarked, "quite clear of any doubt," inasmuch as it declares that the defendant acted as an apothecary in treating medically cases that were dangerous.

In this respect, therefore, we must regard the prosecution as being quite consistent with the intention recently expressed by the Court of the Apothecaries' Society not to interfere with cases of simple counter practice by chemists and druggists. The object of that body, as we understand it, is not to interfere with such instances of the recommendation of simple remedies or of prescribing and supplying medicines for simple ailments, as those stated by the witnesses for the defence to have been within the ordinary practice of chemists and druggists before the year 1815. These witnesses repudiated the disposition to treat complaints of a serious nature, and declared that while they would have selected for themselves such cases as they felt competent to deal with, they would have sent persons suffering from dangerous disorders to a doctor.

According to the evidence of the witnesses called for the defence, then, it appears that the right claimed by chemists and druggists to carry on what is termed counter practice is not one that the Apothecaries' Society would dispute, and in this respect there is ground for satisfaction that the case has been brought into court.

This case, however, is one which the Pharmaceutical Society could never have attempted to defend under any circumstances, and we venture to think that the position of the chemist and druggist has not been in any way improved by the defence that has been made. There are indeed considerations which lead us to fear that the trial of this case and the discussion to which it has given rise may prove injurious to the interests of the trade generally. Among other things it has brought prominently forward the fact that a line must be drawn somewhere between the practice that is legitimately no less than reasonably within the province of a chemist and druggist, and that which it was no doubt the object of the Apothecaries Act to prevent even in the case of the apothecaries of the time when it was passed.

We have on previous occasions expressed our opinion that from the legal point of view there is in this country no direct monopoly in the practice of medicine, and without going into the question whether that is a desirable state of things or not, common sense would lead to the conclusion that if it be admissible for any member of the community to prescribe for his neighbour or treat him medically it would be absurd to debar from doing so those men who have more special knowledge of drugs and their uses than the majority of people.

But the decision of the case now referred to has the effect of placing the chemist and druggist at a greater disadvantage in this respect than other people. He enjoys, it is admitted, an exemption under the provisions of the Apothecaries Act from the restrictions that were imposed upon apothecaries by that Act, but by a strange sort of paradox he is now held, almost as it were in virtue of that exemption, to have less liberty of action in regard to the practice of medicine than other people who are certain to have even less capability of applying drugs for treating disease than he must necessarily have acquired from his daily experience.

It is in this respect that we consider this trial has had the effect of placing the chemist and druggist in a worse position than he was before, and the result of it confirms the view we have always held in regard to the question of counter practice; in the abstract it is desirable that the pharmacist should not engage in the treatment of disease, or do anything which trenches upon the province of a class of men with whom he has relations so intimate as those existing between pharmacy and medicine. It is equally desirable that the province of the pharmacist should not be invaded by the medical practitioner. But since there is in both directions a want of proper allocation of duties, and in many instances, serious obstacles in the way of any such adjustment of the functions of medical practioners and pharmacists, as would satisfy both classes, we believe that more is to be expected from the cultivation of mutual esteem than from the assumption of the defiant and antagonistic attitude which is unavoidable when a court of law is made the arena for establishing a principle.

ARSENICAL VIOLET POWDER.

A PROSECUTION has at length been instituted in respect of the sale of violet powder, alleged to be mixed with arsenic, and several witnesses have given evidence, that after using the powder in question, for children, eruptions of the skin were produced and in several instances more serious results followed. The case for the prosecution, however, was not completed, and the hearing is adjourned. We purpose giving a full report next week.

Parliamentary and Law Proceedings.

THE PHARMACEUTICAL SOCIETY *v.* THE LONDON AND PROVINCIAL SUPPLY ASSOCIATION, LIMITED.

In the Bloomsbury County Court, before the judge, Geo. Luke Russell, Esq.

JUDGMENT.

The Judge: This is an action to recover a penalty under the Act of the 31 and 32 Vict. cap. 121, that being an Act for regulating the sale of poisons, and the defendants are a company duly registered under the Companies Acts, a limited company. It was urged before me in the action, that when the memorandum and articles of association and the register of the company are referred to, and the facts known, the company is in truth a sham and a fraud against the Act, but I am not able to go into that question at all. I cannot go behind the registration, and indeed the action is brought against the company without any co-defendant. It is not against any individual, and therefore, in this action at all events, it would be wrong if the company were not the proper parties to contest the matter.

The facts of the case are these. The defendants are the London and Provincial Supply Association, Limited, professing to be, and I must take it to be, a company similar to many that are now known for the supply of goods, of which the Civil Service Supply Association is a very well known example. The defendants include in their store a regular chemist and druggist's shop, and carry on there the business of chemists and druggists, including the sale of poisons absolutely, and also those included in the prescriptions which they make up—medical prescriptions prescribed by medical men. That branch of the business is in fact carried on by Mr. Longmore, who is a duly qualified chemist and druggist, and a shareholder. He is assisted in the business by two gentlemen, who are also qualified to assist in a chemist and druggist's shop. Amongst the shareholders there is one, at least, who is not a registered chemist and druggist; and indeed Mr. Mackness, who is in fact really the company, for he holds shares representing £5640, and all the rest of the shareholders only hold shares to the extent of £360—it is obvious, therefore, that substantially Mr. Mackness is the company and I understand that he himself is not a registered chemist and druggist.

Now the question is, whether a company of this sort, in which a shareholder is not a registered chemist and druggist, is at liberty to sell poisons without committing an offence under the Act of Parliament, and incurring the penalty imposed by it. Now section 1 of the Act recites that "Whereas it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, or compounding of poisons, that persons known as chemists and druggists should possess a competent practical knowledge of their business," and so on, that they shall be registered. Then it enacts that "from and after the 31st December, it shall be unlawful for any person to sell, or keep open shop for retailing, dispensing, or compounding poisons" (omitting the other part of the section) "unless he shall be a chemist and druggist within the meaning of the Act," and so on. Then section 15 says this: "From and after this day, any person who shall keep an open shop," and so on, "not being a chemist and druggist, shall for every such offence be liable to a penalty of £5," to be enforced in the manner pointed out by the Act. Then section 16 provides for the fact of a regularly authorized chemist and druggist dying, and says, "It shall be lawful for his executors, administrators, and trustees to continue the business, if and so long only as such business shall be *bonâ fide* conducted by a duly qualified assistant," and so on. Those are the clauses of the Act to which my attention was called. In addition to that my attention was also called to an earlier Act for the construction of statutes, in which it says that in certain cases the word "person" shall include a corporate body. Upon that it was contended that this corporate body, including persons who are not duly qualified chemists and druggists, could not carry on such business without incurring the penalties imposed by the Act. Now the first thing that strikes one is that if Mr. Longmore had sold these things for himself alone he would not have committed any offence whatever. He is a duly qualified man, and if he had kept an open shop and sold poisons he was duly qualified to do that, and it would be no offence whatever. However, it is said that it was committing an offence because the business was so conducted that money is acquired, and the profit so made goes into the pockets of other people. That obviously is not within the mischief intended to be remedied by the Act. I have carefully considered it and have availed myself of the very able argument of Mr. Flux on the part of the plaintiffs, but the result I have come to is that it is not an offence within the Act when done in the manner this has been done. It does not become unlawful when done on behalf of the company, so long as the business is conducted by a duly qualified chemist and druggist who, if carrying it on for his own benefit would not be within the penalties of the Act. It is not within the mischief intended to be prevented, and I am of opinion that no offence within the Act therefore was committed. Now the Act 7 and 8 Geo. IV. is the Act containing the interpretation clause, and I am asked to determine that there is no company at all, but that it was an unqualified man carrying on business, and in point of fact the company was a sham. If that were so I can quite understand that it was to the interest of the public that the thing should be stopped, but, as I have said before, I cannot go into that question—I cannot go behind the register. All I can do is to give judgment for the defendants.

Mr. Crouch: With the costs of the suit.

The Judge: Yes; they follow.

Mr. Flux: It is possible my clients may desire, as this involves a question of principle, to carry it further. If any leave of your Honour to go higher is necessary you will, of course, give it.

The Judge: Do you ask leave to go to the Appeal Court?

Mr. Flux: Yes.

The Judge: Certainly. You are raising the point in the interest of the public, not for your own benefit, and it is my duty therefore to give you every facility to question my judgment. You had better apply under the last section of the last Act. You will have my notes. You raise a point of law, you have my decision upon it, and upon that you go to the Court of Appeal.

Mr. Flux: I think there are alternative courses, a motion or a special case. Concerning that I am very much in your Honour's hands as to which would be the better course.

The Judge: It is under the 38 and 39 Vict. cap. 50, that you will proceed.

The Registrar: It is judgment for the defendants with £1 13*s.* 6*d.* costs.

THE SOCIETY OF APOTHECARIES *v.* WIGGINS.

This suit, which was an action against a registered chemist and druggist, residing at Bermondsey, commenced in the High Court of Justice, Exchequer Division, Bail Court, Westminster, on Thursday, May 23, 1878, before Mr. Justice Field and a common jury.

Mr. Morgan Howard, Q.C., Mr. Finlay, and Mr. Gore appeared for the plaintiffs; Mr. McIntyre, Q.C., and Mr. Higgins appeared for the defendants.

Mr. Gore opened the pleadings.

Mr. Morgan Howard: May it please your Lordship, Gentlemen of the jury. This is an action, as you have heard, brought by the Society of Apothecaries in London, to recover penalties against the defendant, Mr. Wiggins, for practising as an apothecary contrary to the provisions of the law in that respect. I present the case to you as a case of considerable importance as affecting the privilege which the public are entitled to enjoy with reference to the medical attendance which they are able to get in this country, under the provisions of the various statutes which have been passed for their protection, and I shall ask you to say if Mr. Wiggins, who is a chemist, I believe, has infringed the statutes and made himself liable to the penalties for which the plaintiff claims. I will not at this stage of the case occupy your attention with the character and constitution of the Apothecaries' Society. It may be enough if I remind you that the Apothecaries' Society are a very ancient company in the city of London, in whose favour, for public benefit, there has been a good deal of legislation from time to time; they were originally constituted in the reign of some of the early kings of this country, and they have received the attention of the legislature for the purpose of administering skilfully medicine in this country, from time to time down to the present time. I think there was a charter in the year 1617 which it is important for you to bear in mind, by which it is provided that no person should act as an apothecary unless he had undergone an apprenticeship of seven years, and had undergone an examination; so that you see as early as the year 1617 there had been attempts made by persons who had not undergone a proper examination so as to satisfy the legislature that they were able to administer medicine for the cure of diseases, and by that charter it was made compulsory on the persons who were to administer medicine that they should undergo an examination which was to be a test of their skill.

Mr. Justice Field: It is not an obligation.

Mr. Morgan Howard: Yes, my Lord, it specifies the penalties which persons are under who had not undergone the examination specified in the charter. Now, in the year 1815, the legislature, recognizing the still greater importance of preventing persons from affecting to prepare medicine and from attempting to cure diseases without having undergone proper examinations in that respect, interfered and passed an Act, which is the Act under which this action is brought. I may state very briefly to you with reference to this Act of Parliament, that power was given to the society to appoint a Court of Examiners, and it was enacted that from and after August 1, 1815, it should not be lawful for persons except those already in practice at that time to practise in England and Wales, unless he or they should have been examined by the Society of Apothecaries. "And to prevent any person or persons from practising as an apothecary without being properly qualified to practise as such, be it further enacted, that from and after the first day of August, one thousand eight hundred and fifteen, it shall not be lawful for any person or persons (except persons already in practice as such) to practise as an apothecary in any part of England or Wales, unless unless he or they shall have been examined by the said Court of Examiners, or the major part of them, and have received a certificate of his or their being duly qualified to practise as such from the said Court of Examiners, or the major part of them, as aforesaid, who are hereby authorized and required to examine all person or persons applying to them for the purpose of ascertaining the skill and abilities of such person or persons in the science and practice of medicine, and his or their fitness and qualifications to practise as an apothecary; and the said Court of Examiners, or the major part of them, are hereby empowered either to reject such person or persons, or to grant a certificate of such examination, and of his or their qualification to practise as an apothecary as aforesaid: provided always that no person shall be admitted to such examination until he shall have attained the full age of twenty-one years." Then it was further provided, "That no person shall be admitted to any such examination for a certificate to practise as an apothecary unless he shall have served an apprenticeship of not less than five years to an apothecary, and unless he shall produce testimonials to the satisfaction of the said Court of Examiners of a sufficient medical education, and of good moral conduct." Such is in brief outline the statutory obligations which rested on persons, and still rests on them with reference to the right of practising medicine as such in this country, as distinguished, you know, from the right which persons have under the Pharmacy Act of keeping open shops for the mere sale or vending of compound medicines. Now, by the Act of 1815, the legislature specified certain penalties against persons who should sin against that Act after the protection which is given, and those are the penalties for which we are suing to-day and for which the Apothecaries' Society are bound to sue, and which is the mode which the Act of Parliament indicates as the proper mode of procedure. Then it is provided, "That if any person (except such as are then actually practising as such) shall after the said first day of August, one thousand eight hundred and fifteen, act or practise as an apothecary in any part of England or Wales without having obtained such certificate as aforesaid,"—and that will not be attempted to be proved here, I believe I am at liberty to say, by my friend at the trial—it says that if any person act or practise as an apothecary without having obtained such certificate as aforesaid of the Society of Apothecaries, showing that he is qualified to act as such, he is liable to the penalties stipulated there. By that Act it was provided, "That nothing in this Act contained shall extend or be construed to extend to prejudice or in any way to affect the trade or business of a chemist and druggist in the buying, preparing, compounding, dispensing, and vending drugs, medicines, and medicinable compounds, wholesale and retail; but all persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same, shall and may use, exercise, and carry on the same trade or business in such manner, and as fully and amply to all intents and purposes as the same trade or business was used, exercised, or carried on by chemists and druggists before the passing of this Act." It is on that part of the case that I believe my friend will endeavour to say something to you. That is the only point really made on these pleadings, and I will examine briefly the section of the Act of Parliament on that part of the case. The defendant alleges that before the passing of the Act of 55th George III., "It was usual and customary for chemists and druggists in using, exercising, and carrying on the trade or business of a chemist and druggist to prepare, compound, and supply medicines of their own selection, in their own shops, for the cure of simple complaints;" and the defendant says that if he did attend, advise, and supply medicines (which he denies), he did so by preparing, compounding, and supplying medicines of his own selection, in his own shop, for the cure of simple complaints, in accordance with the use and custom aforesaid, and not otherwise.

Now, gentlemen, section 28 of the Act of Parliament which stipulated that chemists and druggists were not to be affected by the Act, is in these terms, "Provided always, and be it further enacted, that nothing in this Act contained shall extend, or be construed to extend, to prejudice, or in any way to affect the trade or business of a chemist and druggist in the buying, preparing, compounding, dispensing, and vending drugs, medicines, and medicinable compounds, wholesale and retail; but all persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same, shall and may use, exercise, and carry on the same trade or business in such manner, and as fully and amply to all intents and purposes as the same trade or business was used, exercised, or carried on by chemists and druggists before the passing of this Act." I will not, at this period of the case, detain you by a detailed criticism on the difference between the statement of defence of the defendant, and the provisions of that section of the Act of Parliament, but merely at present remind you that in the cases which I have to present to you we have nothing to do with the cases of simple ailments, and that, therefore, that is no defence to the action.

Now, gentlemen, the cases which I shall have to present to you by the witnesses in the witness box, are the cases of children suffering under complaints of a serious character. The complaints were so serious indeed that during the attendance of the defendant they died. I think there were three or four children, I am not going to say that they died, I would rather not say, I desire not to say it, and I do not say, that their deaths are to be attributed to any negligent treatment. I only mention the fact that the children did die, and I do so to point out to you that the children were suffering from very serious illnesses, of which he took their treatment, by which he has made himself liable to the penalties claimed. For instance, two children were taken to his own shop—taken by the parents. He examined them, asked what they were suffering from, that is, he asked their symptoms and asked the questions which you would expect to be asked by a person affecting to be skilled in medicine, and, having ascertained that, he then pronounced the disease from which they were suffering, and, in one case, he said the child was suffering from diarrhœa. He selected medicine, he made it up, he sold it, and received the money for it, and shortly after the administration, so serious in point of fact was the illness from which the child suffered, that the child died.

Now I take another example. A child is taken to the shop and the examination which I have described to you is made again, and the defendant says that the child is suffering from scarlet fever, and he makes up the medicine. The medicine is repeated, five or six times, I think. I think, in this case, the mother saw the defendant five or six times with reference to this particular child. He treats the child for scarlet fever; he takes the money for the medicine which he makes up and supplies, and that child dies.

Now another case is the case of a child ——

Mr. McIntyre: there are only two cases mentioned, my Lord, in the statement of claim.

Mr. Morgan Howard: We have given notice of a third.

Mr. Justice Field: I think you should amend by putting it in.

Mr. Morgan Howard: We have given them notice of it, my Lord.

Now, in another case, gentlemen, a child is evidently taken very ill. The child is not taken—probably it was too ill to be taken; the mother went to the shop and saw the defendant and told him the state of the child. He inquires what are the symptoms—what are the indications of the illness, and so on; and then, having heard all these things which he thought it necessary to learn, treating it with all the art and craft, if I may say so, which belongs to medical men who are qualified by long experience and by the practice of their profession, he decides that to be some simple case, such as wheezing on the chest or something of that kind; and that child dies of a disease known to physicians as pneumonia.

Now take another case. A child is taken to the defendant's shop. He examines her and goes into the question of the symptoms, and he decides her to be suffering from bronchitis. He mixes up medicines and he is paid for it. The child goes away, he sees her again and examines her, and then, I think it was upon that occasion, he advised—feeling that the child was in a critical position, he seems to have had some apprehensions that a fatal result might ensue—that a properly qualified man should be called in to see the patient. That child also died, and in respect of those four cases which I have offered to you as illustrations, I think I am entitled to say this: we can see the importance of the legislation which has been introduced into this country from time to time in not permitting persons who are not qualified by medical education and experience, which we all know is a matter of greatest difficulty, and can only be acquired by a patient and constant study, to act as duly qualified persons, and to protect the public from the maladministration of medicine.

Now, gentlemen, what the defendant says is, that he was entitled to do what he has done, as a chemist and druggist, and at all events entitled to treat simple ailments. Now if it were necessary to treat the case from that one point of view I think it would be enough to solve the question which my friend puts to you, to ask you if they were simple ailments. I think you will say they were not. If your children had such complaints, and a gentleman called them simple ailments, you would come to the conclusion that he was not skilled as a medical man, and scarlet fever, pneumonia, and so on would require a skilful man to treat them.

Now, gentlemen, the truth is that chemists and druggists are in no way hampered or hurt or injured by this legislation. They have been well taken care of by the legislature. They have the privilege of excluding from the practice of their own business all medical men who are qualified as medical men. They are entitled to be registered under the Pharmacy Acts in order to practise the business of a chemist and druggist. Therefore they have no right to complain, and whether or not a chemist or druggist was or was not such a person as is suggested by my friend in the pleadings in the year 1815, when this Act of Parliament was passed, I think will be quite unimportant to you. At that time it seems to have received consideration, as I think you would expect it would receive, from the legislature of King George III. The trade of a chemist and druggist is described as buying, preparing, compounding, dispensing, and vending drugs, medicines, and medicinable compounds, wholesale and retail. I say, as it must be said, that the legislature of that day did not have the smallest objection, and nobody can have, to a chemist and druggist buying, selling, preparing, compounding, and vending drugs and medicines, and medicinable compounds, wholesale and retail. It is necessary that he should do that and not step over the line which he is not authorized to do, to prescribe in serious cases and administer his medicines as a duly qualified person, for that purpose. This definition of chemist and druggist has been recognized in later Acts of Parliament which it is not necessary for me to refer to, but I must own to you that it is now necessary for them to be registered under the Pharmacy Act.

Mr. Justice Field: Can you tell me of any definition of the words chemist and druggist?

Mr. Morgan Howard: Yes there is an examination provided for chemists and druggists, and I show you that it cannot be competent for them to deal with these cases where the law has declared that there shall be an examination in the proficiency of medicine or surgery, neither are they entitled to practise medicine, surgery, or any branch of it. There is an express provision as to the practice of surgery. The legislature has down to these days, within half a dozen years—so extremely anxious and jealous have they been of the attempts which were made by incompetent persons who have attempted to practise surgery—provided that they should not be permitted to undertake the cure of diseases which they are not competent to do, and to administer medicines for those diseases the character of which they do not understand. On the other hand, chemists and druggists can be registered under the Pharmacy Act, and therefore the legislature has taken care of both parties, and it is for the protection of medical men on the one side and for the public on the other that the proceedings are taken, in the only way in which they can be taken, to recover the penalties for the offences committed.

Now I have given you a brief outline of the case, but I may say in passing that my friend has put a plea on the record, as I have told you, about the trade or business as a chemist or druggist, but it is very noticeable with regard to the 28th section of the Act of George III., that whereas the section provides that it should not extend to, or prejudice the business of a chemist in the buying, preparing, compounding, and dispensing drugs, medicines, and medicinable compounds, wholesale and retail, the plea put on the record is, that before the passing of the Act it was usual for the persons to prepare, compound, and prescribe medicines of their own selection, in their own shops, for the cure of simple ailments. We shall see what they say, and I believe there is some intention on the other side of presenting to you some venerable personages who have survived since so long back as the year 1815, for the purpose of showing you that they prescribed for simple complaints in their days; but I do not think that it is a defence that because they did before, and in the year 1815, when they were young and vigorous, practise as chemists and druggists by curing simple complaints, and that therefore if they did it then they are entitled to do it now, and that that is a defence to the action. I think we shall find it is no kind of defence at all, and I present the case to you as being virtually an undefended action. Now the legislation of the country has received careful judicial exposition, and in the year 1843 there was a similar action to this, the case of Attorney-General against Lotinger, which is cited in the 2nd Moody and Robinson, at page 495. That was a question between the apothecary and the surgeon.

Mr. Justice Field: I see in the Attorney-General and Lotinger, Mr. Justice Cresswell seems to say that a surgeon is a person who professes the use of surgery—that is to say, he may cut off a limb as a surgeon, and that he may practise as an apothecary, if I may use those words, because he may prescribe something. It is said that he could do so.

Mr. Morgan Howard: You see, therefore, what Mr. Justice Cresswell, a judge of the greatest eminence, declared was the proper view to be taken of the difference between practising as an apothecary and a druggist, and as your good sense would suggest to you without the aid of law, the chemist is to make up the medicines prescribed by a physician and take his money for his medicine or pills. But the licensed apothecary, having undergone medical examination and medical education, could judge of the disease and be able to say what was the proper medicine which the patient ought to receive. Now if evidence is laid before you, as I believe it will be, that this gentleman judged of internal ailments by the symptoms, and ascertained, or professed to ascertain, what the patient was suffering from, and that he selected his medicines, made them up, and charged for them with a view to curing the patient—now if that is proved in that way, I think it would be difficult to have a clearer case than this, of a person practising as a medical practitioner who is not duly qualified. Now the apothecaries have this duty put on them by the legislature, and I ask you to return a verdict when you have heard the evidence for the plaintiff, and thus assist us in repressing and in bringing to a conclusion some of the attempts which are made to evade the proper province of proper medical practitioners who are duly licensed, and thus protect the lives and health of our fellow creatures; and gentlemen, I say it is not because they are poor that they are to be left to the incompetent hands of mere chemists and druggists, who do not profess, or who ought not to profess, to understand the art and science of medicine and surgery, and who are prohibited expressly by the legislature from acting as either the one or the other. I do not think I ought to detain you any longer at this stage of the case, but I shall have an opportunity of saying a word or two to you afterwards.

Now it would be safe if I were to refer your Lordship to a few cases. I cite to your Lordship the case of Ellis *v.* Hayden, 4th Bingham.

Mr. Justice Field: I want to know as a matter of law what a chemist is?

Mr. Morgan Howard: I think there is great warrant for saying that your Lordship can say that upon the construction of the Act of Parliament.

Mr. Justice Field: What is the qualification of a surgeon?—In the last Act the qualification of a surgeon is recognized.

Does it appear what the qualification of a surgeon is?—Section 31 of the last Act says, "Every person recognized by this Act shall be entitled according to his qualification or qualifications to practise medicine or surgery, or medicine and surgery, as the case may be." Now I want to know what is his qualification. What is the meaning of that "According to his qualification"?

Mr. Morgan Howard: I will refer your Lordship to Glenn's well known treatise, where your Lordship will find the qualifications of a surgeon.

Mr. Justice Field: But what is the qualification; where does the law lay it down. I know what the word means in common sense, but I want to know when the statute says he may practise under the name of surgeon. May I cut off a man's leg?

Mr. Morgan Howard: No, my Lord, you may not.

Mr. Justice Field: Why not.

Mr. Morgan Howard: Because you have no diploma.

Mr. McIntyre: Your Lordship may cut it off if you do not charge for it.

Mr. Morgan Howard: I will find it out by a specific reference; but I think here the question which we have to try is of a different character.

Mr. Justice Field: I quite agree the facts in this case do not point to surgery at all; but in construing the Act I have to say what a surgeon is, what an apothecary is, and what a chemist and druggist is. If I may cut off a man's leg, and in cutting off that leg, if I may administer cooling medicine, I should be acting both as a surgeon and as an apothecary, which I may do if I do not charge. I may cut off a leg and administer an aperient or cooling medicine.

Mr. Howard: That would be acting as a surgeon.

Mr. Justice Field: Yes, I, sitting as I am, not having gone through any Hall at all. Of course if I were to do it negligently I might be liable to be indicted for manslaughter or for murder.

Mr. Morgan Howard: Which we should be very sorry to contemplate. I will point out to your Lordship by and by what the precise qualification of a surgeon is, and I will now conclude what I have to say, that although for the purposes of the case it may be necessary by and by to construe the Act of Parliament, I will give your Lordship the definition in point of law of what a surgeon is and so on, yet upon the facts I have opened to you this is a case which is clear from any such difficulty which may arise as to that, because it is clear that an unqualified person keeping a shop as a chemist and druggist practised that which he is forbidden to practise, the art and science of medicine, and practised as an apothecary, which is only to be practised by a duly qualified person, and having prescribed for diseases of which really he knows nothing, administered medicines for the cure of those diseases and charged for the same, contrary to the provisions of the Act of Parliament. Now if I establish those facts before you I shall have made out a very clear case of infringement of the Apothecaries Act, and I trust you will assist the Apothecaries' Society in their endeavours to put down this unlicensed practising which is so detrimental to the community at large.

Elizabeth Culverwell sworn. Examined by Mr. Gore.

Do you live at 229, Fort Street, Bermondsey?—I do.

In September, 1876, had you a child of the name of Alice?—Yes.

At that time was it two years old?—It wanted a week to it.

Mr. Gore: In September, 1876, was it suffering from illness?—From a slight cold.

Did it keep its bed or not?—No.

Do you recollect going to Mr. Wiggins's shop—the defendant's?—Yes; on the Monday after it was taken ill.

Did you take your child with you?—No.

What shop does Mr. Wiggins keep?—It is a chemist's shop, I believe.

Did you see Mr. Wiggins there?—Yes.

What did he tell you about your child?—I told him my child was poorly; he asked me what I thought was the matter with the child.

Mr. Justice Field: Did he know your child? Had he seen it before?—Yes; I had taken it before.

What did you take her to him before for?—For the same complaint, a cold on the chest.

You had taken the child then had you?—Yes; before had, but not this time.

What happened next?—He said, what do you think was the matter with the child?

What did he tell you?—He said it was a cold, and if I could keep the wheezing there would be no danger.

He told you?—Yes; he said it was a cold.

What did you say to him?—I told him she had a wheezing on the chest, and she was very thick at the chest.

Mr. Justice Field: Is that all you told him?—Yes.

What did he say then?—He said if I could keep the wheezing there would be no danger, but if the wheezing stopped, and she got thick, there would be danger.

Mr. Gore: Did he say at all in what case it might be dangerous?—No he did not.

But if the wheezing continued there would be no danger?—Yes.

Did he give you anything?—He gave me a bottle of medicine and he told me to put mustard plasters on.

Mr. Justice Field: To put mustard plasters on her chest?—Yes.

Mr. Gore: Did you wait while he prepared the medicine?—Yes.

Did he prepare it himself?—No, his assistant.

In his presence?—Yes.

Mr. Justice Field: His assistant prepared it?—Yes. I think Mr. Wiggins went out of the room at the time.

Did he give directions to his assistant to prepare it?—Yes.

Mr. Gore: Did you see the assistant prepare it?—Yes.

Did he prepare it from one bottle or more bottles than one?—That I cannot tell you, it is a long time ago.

Mr. Justice Field: You cannot say if it was a mixture?—I cannot say; it is such a long time ago.

Mr. Gore:—Did you pay him for the medicine, and take it away?—Yes.

How much did you pay?—I think it was 7*d.*

Did he give directions how it was to be taken?—Yes.

What did he say?—I think it was a teaspoonful three times a day.

Mr. McIntyre: Did he say so, or was it written on the bottle?—It was written on the bottle, but he told me so besides.

Mr. Gore: Did you give it to your child?—Yes.

Did she take it?—Yes.

Did you go again to him?—Yes.

How soon afterwards?—I think it was the following night, as soon as the bottle was taken—the next night.

What did you tell him about your child then?—I told him I thought she was a little better.

Did he ask questions about it?—He told me to continue on the same that I was going on.

Mr. Justice Field: With the same medicine?—Yes.

Mr. Gore: What did he do on that occasion; what did he give you?—The same medicine, I believe.

Did he prepare it himself?—No, the assistant.

Mr. Gore: Was he there when it was prepared?—Yes, Mr. Wiggins was in the room, I think.

Did you hear him give any directions to his assistant?—Yes, I did; the same.

Did you give the medicine to the child?—Yes, my child was under him up to the Saturday. She was under Mr. Wiggins from the Monday to the Saturday.

Mr. Justice Field: What day was this?—We thought she was getting better, but afterwards we took further advice for her.

What happened on the Saturday?—On the Saturday we got further advice, and on the Monday she was taken very ill.

Mr. Gore: Did you administer any further medicine before the Saturday?—Yes, up to the Saturday.

How many doses?—I think it was about four bottles, not more; perhaps three.

Did you go to the shop for it twice?—Yes.

Did you see him on either of those occasions, or only the assistant?—Only the assistant.

Mr. Justice Field: You had three or four bottles of the same preparation, and on the Saturday you had further advice?—Yes.

Mr. Gore: I may take it that you paid on each occasion for the medicine that you got?—Yes, he always did her good each time I took her.

Who did—Mr. Wiggins?—Yes.

You mean on a former occasion?—Yes.

I believe your child died?—She did.

When did she die?—She lived until the Tuesday evening. I gave Mr. Wiggins up on the Saturday, because he could not attend the child.

On Saturday the child went to bed?—Yes.

And then you called in further advice?—No she was playing about on the Saturday, and I called in further advice because I was advised to, and on the Saturday she was taken to her bed and never got up again.

She was not so bad on the Saturday?—She seemed well to me, but it was other people.

Other people advised you to get other advice, and you did so, and she took to her bed, and was confined to her bed and died on the Tuesday?—Yes, but she did not die under Mr. Wiggins. I think if Mr. Wiggins had attended her, the child would not have died.

You think she would have recovered?—Yes.

Mr. Justice Field: We are not trying that question.

Mr. McIntyre: No, my Lord.

Mr. Justice Field: That is quite irrespective of the question. The question is, if he has come within the Act. We must keep clear from any imputation on Mr. Wiggins's knowledge of the science.

Mr. McIntyre: Yes, my Lord.

Mr. Justice Field: The question is, did he do a thing which the law says he ought not to do?

Mr. Morgan Howard: I abstained in addressing the jury from saying anything of the sort, except as to the fact that the children had died.

Mr. Gore: What did the child die of?—I do not know.

Cross-examined by Mr. McIntyre.

You took further advice. Was that the advice of a medical gentleman?—Yes, I believe so.

Did he call himself a doctor?—Yes, Dr. Cooper.

Did Dr. Cooper attend the child from the Saturday until the time the child died?—Yes.

During the time that Dr. Cooper attended the child Mr. Wiggins had nothing to do with the child?—No.

Mr. Justice Field: After the Saturday he had nothing to do with her?—No.

Fanny Grist sworn. Examined by Mr. Morgan Howard.

Do you live at Blue Anchor Road, Bermondsey?—Not now. I did at the time.

Had you a child named Lucy Grist?—No; Louisa.

She was unwell, was she not?—Yes.

Do you remember taking her to Mr. Wiggins's shop?—Yes.

When was that?—On the Sunday evening of July 1st.

July of last year?—Yes.

Had you been there with her before?—Yes.

The child had been suffering before?—Yes, but she had not been under Mr. Wiggins.

She had not been under Mr. Wiggins before?—No.

Now when you took her to Mr. Wiggins in July, 1877, she was ill, was she?—Yes.

What did you say to Mr. Wiggins when you took her to the shop?—I asked him to give me a little medicine for my child.

Was anything said about what was the matter with the child?—Mr. Wiggins did not say.

Did he inquire of you what was the matter with the child?—Yes. I told him I thought she was going to have convulsions.

Mr. Justice Field: What did he say to you when you asked him if he would give you a little medicine?—He said, "Yes, I will."

Well, what was next?—He asked me what were the symptoms, and I told him.

What did you say?—I told him I had given her half a teaspoonful of castor oil in the morning and she had been lying very ill all day. I told him when she was five months old she had had convulsions very bad.

How old was she then?—Twelve months.

When she was five months old what was the matter with her?—She had had convulsions and I thought by appearances she was going to have them again, and Mr. Wiggins thought the same.

Did he say so?—Yes.

Did he examine her?—Yes, he did.

And he said, "I think so too?"—Yes, and he gave me a bottle of medicine.

Did he prepare it?—Yes, he made it up himself.

Did you see how he made it up?—No, I did not notice that. And he gave a powder.

Did he make the powder?—I do not know. He took it from the drawer. I could not say.

Do you know whether he made up the medicine?—Yes, he did not take it down from the shelf.

Mr. Morgan Howard: Were there any directions as to how the medicine was to be taken by the child?—Yes, as soon as I got home I was to give her the powder, and an hour afterwards I was to give her a dose of the medicine. which I did.

Mr. Justice Field: Do you know what the draught was?—No; I think it was two teaspoons.

What sort of draught was it?—I think there was rhubarb in it. It was an aperient draught. My children had had something similar before.

Did you pay for this medicine and powder?—Yes: I am not sure how much; it was either 6*d.* or 9*d.*

Did it act on the child's bowels?—No.

You administered the medicine to the child?—Yes.

How many doses were in the bottle, do you remember?—She only took one dose.

Did you take her to the shop?—Yes.

On the Sunday evening?—Yes.

Mr. Justice Field: Did you give her the whole of the contents of the bottle?—No. She died just after we gave her the first dose.

How much was she to have of the mixture?—I won't be sure, it was either one or two teaspoonfuls, but we gave her only the one.

After the first dose she died?—Yes, she died in convulsions.

Mr. Morgan Howard: Did you see Mr. Wiggins after that?—Yes.

When was it?—When the child was taken with this fit, my husband ran over to the nearest doctor. It was Dr. Reid. He came over immediately, but when he came the child had just died.

Did you see Mr. Wiggins after this?—Yes, I went and told him on the Monday.

How long was that after the death?—The day after.

What did you tell him?—I told him my little one had died and I had called on Dr. Reid and he could not give me a certificate.

Did you tell Mr. Wiggins why he could not give a certificate?—Yes.

Mr. Justice Field: He had not attended the case.

Mr. Howard: I only wanted to get it *pro formâ.*

The Witness: I should like to say when I came away from Mr. Wiggins's on the Sunday night, I asked him if he thought she was very bad, and he said, "Yes, she was, and if she was no better I was to call in a medical man the first thing Monday morning.

Mr. Justice Field: He told you that on the Sunday night?—Yes.

Then you gave the child the mixture on the Monday?—No, on the Sunday. It all happened on the Sunday.

When was it you saw Mr. Wiggins?—On the Sunday.

And he said that the child was very ill?—Yes.

And if it was not better in the morning?—No, she died on the Sunday evening.

I want to know what he told you about it.—He said, if she was no better I was to call in a medical man on the Monday morning.

Mr. Morgan Howard: I understood you to say he told you when you saw him first about the child that he thought it might be convulsions?—He said, probably, it might be that.

Did he say anything more about that?—He asked me if the child had had diarrhœa, and I said, "No."

Mr. Justice Field: That was on the Sunday?—Yes.

Mr. Morgan Howard: The child was then in the shop with you?—Yes.

Did he examine her tongue?—Yes.

And feel her pulse?—Yes, he did feel her pulse.

After the examination you had the mixture for her?—Yes.

Mr. Morgan Howard: When you had taken the child to him on the previous occasion, had you taken her for any illness that you wanted him to look at?—Yes. When she was three months old I took her to him and he would not prescribe. He told me to take her to a medical man then.

Mr. Justice Field: On a previous occasion you told him what?—That she seemed as if she was teething.

Mr. Morgan Howard: Was she then about three months old?—Yes.

Cross-examined by Mr. McIntyre.

Mr. McIntyre: Was the child teething on the last occasion when you took her?—Yes, I think it was that.

You think she was teething then?—Yes.

And on this last occasion, I believe, you only took her once, and that was on the Sunday evening?—Yes.

Did Mr. Wiggins on that Sunday evening tell you that if the child at any time had convulsions coming on you were to send for a medical man?—He did not distinctly say at any time.

But if not better that night, or if she became worse that night, did he say you had better send for a medical man?—No, but if I thought she was worse I should have sent for one.

What time was it?—It was about half past six.

Mr. Justice Field: What time did the child die?—About eight o'clock.

Mr. McIntyre: Did the child die in convulsions:—She had one fit.

Did she die in that fit?—Yes.

Re-examined by Mr. Morgan Howard.

There was only one fit?—Yes.

Had she had any convulsions before you took her to the shop on that day?—No.

Rosina Bennett sworn. Examined by Mr. Morgan Howard.

Do you live in Bermondsey, and do you know the defendant, Mr. Wiggins?—Yes.

Do you remember in the month of January, 1877, of last year taking your child to Mr. Wiggins's shop?

Mr. Justice Field: It is February.

Mr. Morgan Howard: It is February in the pleadings, but I think it is January.

Was your child unwell?—Yes.

Mr. Justice Field: What age was she?—Four years old all but two months.

Mr. Morgan Howard: Did you take her to Mr. Wiggins's shop and did you see him?—Yes.

Did he ask you anything about the child?—He looked at her.

Mr. Justice Field: What did he say?—She had bronchitis very strongly and I was to take great care of her.

Mr. Morgan Howard: Did he ask you anything about it, as to how long she had been unwell?—No.

He looked at her and said she had bronchitis.—Yes.

I must ask you what part of her did he examine. Did he look at her mouth?—He looked at her throat.

Mr. Morgan Howard: Did he give you any medicine for her?—Yes.

Did he make it up?—Yes; in my presence.

Was it in a bottle?—Yes.

Did you pay him for it?—Yes; sevenpence.

Mr. Justice Field: Did he make it up?—Yes.

From one or more bottles. Did he mix anything together?—I did not notice that.

You cannot say whether it was all one thing?—No; I did not notice that.

Mr. Morgan Howard: What did he take the medicine out of which he put into the bottle?—Out of bottles.

Did he give you any directions as to how the child was to take this medicine?—Three times a day.

Did you give that bottle of medicine in doses to your child?—Yes.

Did the child get better under that or not?—She was getting worse.

Did you go again to the shop?—No.

Did Mr. Wiggins see the child again?—No; I took her to Mr. Cooper.

What I wanted rather to get from you was this. After you got that bottle of medicine and gave it to the child, you say she did not get better?—No.

Did you get another bottle of medicine from Mr. Wiggins?—No; I took her to a doctor after that.

You went to a doctor then?—Yes; to Dr. Cooper.

Your child died, I think, the next day?—No; not the next day; on the Saturday morning.

A day or two afterwards?—Yes.

Cross-examined by Mr. McIntyre.

Had the child been ill before that?—No.

Had not she had the measles?—Yes, she had had measles and caught cold.

You treated her for measles yourself?—Yes.

Was it after the measles that you took her—when she had caught cold?—Yes.

You say that Mr. Wiggins looked into the child's mouth?—Yes; over the counter.

He looked over the counter, and looked at the child as she was there?—Yes.

And you had this bottle of medicine?—Yes.

Did he say, "The nurse is as good for the child as the doctor, take care of her"?—Yes: it depended on the nurse as well as it did on the doctor.

Do you recollect what day of the week it was that you took her on this occasion?—No, it is so long ago.

How many times did Dr. Cooper see her?—Only once, and I went and got a bottle of medicine afterwards.

After Dr. Cooper had seen her you went and got another bottle of medicine from him, Dr. Cooper?—Yes.

Can you tell me how many days the child lived after Dr. Cooper first saw her?—I cannot remember.

You can tell me whether it was a week?—Not a week.

Was it on the Saturday that she died?—On the Sunday.

Was it on the Monday before that that you went to Dr. Cooper?—I think it was on the Tuesday; I think so.

I believe you could not go to him before because you had not the money?—Yes, my sister gave it to me.

You got that on the Monday before the child died on the Sunday?—It was either the Monday or Tuesday.

Re-examined by Mr. Morgan Howard.

Can you tell me whether Mr. Wiggins saw your child previously to this at any time?—Yes, he did see her once before when she had the yellow jaundice.

When was that:—That was long before. He cured her.

Mr. Justice Field: What was that?

Mr. McIntyre: The witness said the doctor cured her. Care must be taken not to suppose that this is a question of skill in cure. We know children will die. There is nothing in that.

Mr. Justice Field: The Act of Parliament is the only thing which we have to deal with.

Caroline Leggatt sworn. Examined by Mr. Morgan Howard.

Do you know Elizabeth Loades?—Yes.

Was she related to you?—She was my grandchild.

Did you go to Mr. Wiggin's shop about her?—Yes.

When was this; do you remember?—On the Monday morning; the last week in March.

Did you see Mr. Wiggins?—I did.

Did you tell him the child was ill?—Yes.

Did he ask you to describe what was the matter with her; what she was suffering from?—Yes.

What did you tell him?

Mr. Justice Field: I suppose he said "What is the matter with her?"—Yes.

Now what did you say?—I told him it was a violent cold.

Mr. Morgan Howard: Did you describe anything else about her to him?—I said she was very sick.

Mr. Justice Field: Had she been very sick?—Yes.

How old was the child?—Four years and ten months.

Mr. Morgan Howard: Did he ask you anything else about her?—No.

I mean as to whether there had been action of the bowels or anything of that sort?—No.

Having told him what you have told us, what did he say was the matter with her?—He did not say; he said he would make a little medicine.

Mr. Justice Field: Did he examine the child?—She was not there.

Mr. Justice Field: He said he would give her some medicine?—Yes.

Mr. Morgan Howard: Now had he previously to that seen the child himself?—Never.

Did you get some medicine from him?—Yes.

Did he make it up for you?—Yes, I believe he did.

In your presence?—Yes.

Did you see him do it?—I do not think any one else was there.

Mr. Justice Field: Did you see what he did?—I saw him go to one or two bottles and he gave me the medicine.

Did you see him mix the two up together?—Yes.

Mr. Morgan Howard: Did he give you any directions as to how the mixture was to be taken?—The label was put on the bottle.

Did he write anything on the label himself?—That I cannot say.

There was a label on the bottle?—Yes.

Did he put it on the bottle?—He did.

Did you pay him?—Yes, I paid sevenpence.

I do not know whether you yourself saw him after that?—I went to the shop once after that.

Before he saw the child or afterwards?—He never saw the child.

When did you go to him again; how soon after you got the medicine?—I think it would be on the Tuesday.

Was that a day or two after?—I went on the Monday first.

And you went the following day?—Yes.

Did you see him yourself?—I did not.

Did you see the assistant?—No, I did not.

Whom did you see?—I saw Mrs. Wiggins.

You need not tell us anything that passed between you and Mrs. Wiggins; did you get any more medicine?—Not then.

When did you?—Mr. Wiggins was not in.

You left a message I suppose?—Yes.

Did you go again?—I did not, I wished the mother of the child to go.

Cross-examined by Mr. McIntyre.

I did not catch the date when you were there?—It was about the last week in March.

Do you say he went to more than one bottle, or gave you the mixture out of one bottle?—I cannot say that.

It is a long time ago as you say?—It is two years ago.

Were you asked about the circumstances since?—I was not asked about it until that gentleman called on me, I think in August.

Which gentleman?—That gentleman [pointing].

The solicitor?—The solicitor.

You do not know which it was; the gentleman came in August?—Yes, I believe it was in August.

Mr. McIntyre: Did she say it was two years ago that she took it, my Lord?

Mr. Justice Field: Yes.

Mr. McIntyre: That is not either in the particulars or the statement of claim, or anything else.

Mrs. Elizabeth Loades sworn.

Mr. McIntyre: Upon that your Lordship sees the particulars are confined to 1877—March, 1877.

Mr. Morgan Howard: The witness said March, 1877.

Mr. McIntyre: She said it was two years ago, my Lord.

Mr. Morgan Howard: I have called a witness. She said March, 1877.

Mr. McIntyre: She said two years ago.

Mr. Morgan Howard: Here is the mother.

Mr. Justice Field: "Ada Elizabeth Loades, from 14th of March, 1877, or thereabouts."

Mr. McIntyre: They gave the names, but when we applied for the addresses they refused to give them.

Mr. Morgan Howard: Do you object that this is not in the particulars?

Mr. McIntyre: Yes.

Mr. Morgan Howard: The witness has already said it was in March, 1877.

Mr. McIntyre: She says two years ago.

Mr. Morgan Howard: She had said 1877; it is a mere matter of arithmetic.

The Witness: It was two years ago last March.

Mr. Justice Field: Then it is clearly two years last March. You have given a wrong date in the particulars. I do not know whether it is to go off on that account.

Mr. Morgan Howard: We gave the names.

Mr. McIntyre: But you refused to give the addresses. Before the Judge in Chambers they said they were not bound to give the addresses, and did not do so. My learned junior attended it himself.

Mr. Morgan Howard: The order of the judge I have here:—"I do order that you deliver particulars of the other persons and the cases complained of in the statement of claim, or file an affidavit stating that the plaintiff can give no further particulars." Then they delivered the particulars, "Ada Elizabeth Loades, from the 14th March, or thereabouts."

Mr. McIntyre: They filed an affidavit stating that they could give no better particulars, and after that they gave another case.

Mr. Morgan Howard: Yes, particulars, not another case. As soon as we discovered the facts we sent them the information.

Mr. Justice Field: The question is whether, I think, the defendant is prejudiced in that respect. Do you propose to call the defendant?

Mr. McIntyre: Yes, my Lord, if necessary.

Mr. Justice Field: We will take the evidence and see whether he is prejudiced. Take the evidence before the objection is taken.

Mr. McIntyre: Your Lordship in taking the evidence would say not only should the particulars be amended, but the statement of claim should be amended altogether.

Mr. Justice Field: That I should have no difficulty about. If the information is given by particulars, which embody the statement of claim as a rule, I think the parties had better deal with it as it stands, but the difficulty I feel is that you have had no notice of this case; you had notice of Elizabeth Loades.

Mr. McIntyre: Not except by name.

Mr. Justice Field: The case of Ada Elizabeth Loades. You are told it was in 1877. Now if it should turn out that there was a witness who might have assisted you in 1876 who is not here, that would be a matter to be considered.

Mr. McIntyre: As this is an action for penalties, brought under this Act of Parliament, they ought to be very strict in giving their particulars.

Mr. Justice Field: That is a rule I do not understand.

Mr. McIntyre: But it has been understood by your Lordship's predecessors, or at least acted upon.

Mr. Justice Field: Yes, you are well warranted in saying that, but I do not know why I should not. If it is a good or a bad action I have nothing to do with it. I have nothing to do but to enforce the law, whether I think the law is good or not; I may have my own view and other people may have theirs, but I have to try cases so that neither parties should be prejudiced. If I could see at the present moment any reason to suppose that your defence would be different in Loades's case, or that you would be worse off with regard to Loades's case by reason of a mistake in the date—I am sure it is a mistake—I would adjourn the matter.

Mr. McIntyre: I do not know, because we have had other persons. We endeavoured to get particulars and resistance was made to every attempt.

Mr. Justice Field: Of course the Society of the Art and Mystery of Apothecaries have their duty to perform, and it is their duty to get up evidence. We know how even if you are the client yourself, you do not like to give the solicitors dates. I do not say that you would not, but you might not like to. Just consider how easy it would be. For that woman who first came here said first of all that it was in 1877, but that was because Mr. Morgan Howard put it to her.

M. McIntyre: And she adopted the date, whatever it was.

Mr. Justice Field: On the whole I think I will do this. You had better try it out now. If I see that you have any reason to be prejudiced on that particular matter I will protect you when I come to that particular case, or if necessary I will adjourn for a short time, if you show me that there is any injury done to you, for you to get any witness you like so that you shall not be harmed.

Mr. McIntyre: Very good, my Lord.

Mr. Justice Field: It is very much the same character as the two other witnesses; it is not a question of amount here, it is a question of principle.

Mr. Morgan Howard: Quite so, my Lord. It is not the pecuniary penalty that my friend so much fears.

Mr. Justice Field: No; I dare say Mr. Howard would not ask for the penalty.

Mr. Morgan Howard: I will say this at once to my friend, that out of those four cases, which I hope to submit by and by are entirely proved, I shall only ask for one penalty.

Mr. Justice Field: I assume that is the only object of the action.

Mr. Morgan Howard: Quite so, my Lord.

Examined by Mr. Morgan Howard.

The lady who was last in the witness-box was the grandmother of your child?—Yes.

She has told us that she went to see Mr. Wiggins. Did you after her visit go and see Mr. Wiggins yourself about the child?—Yes.

Was that after your child had taken the medicine which was brought from the shop?—Yes.

Was the child better or worse when you went?—No, I think she was worse.

You went and saw Mr. Wiggins at the shop. What did you tell him?—I told him that she had had a restless night.

Mr. Justice Field:—Had you employed him before?—Not in that case.

Mr. Morgan Howard: Was it a boy or a girl?—A girl.

You told him she had had a restless night?—Yes; I told him that she was not quite so feverish as she was.

Not quite so feverish?—No. I think I asked Mr. Wiggins what he was attending my child for from the first, and he then told me it was scarlet fever. I then asked him whether he thought my child was getting on all right. He said yes, as long as her throat did not swell; that is all that he said.

Did you get any medicine from him?—I think so, but I am not certain.

Just try and remember whether you did. Did you give the child medicine after seeing Mr. Wiggins?—Myself; yes, I do not think I was without medicine.

Did you have a bottle after the one the grandmother had brought the child?

Mr. McIntyre: She does not say so.

I am not certain.

Mr. Morgan Howard: You do not remember whether she had another bottle from Mr. Wiggins or not?—No.

Do you remember paying him any money since that?—I do not.

How often did you see Mr. Wiggins yourself?—I only saw him once; that was on the Wednesday evening.

Did you get a powder at all?—Yes, a powder.

Mr. McIntyre: My friend ought not to lead, my Lord.

Mr. Justice Field: No.

Mr. Morgan Howard: I believe you called in Dr. Cooper to see the child, did you not?—Yes, on the Friday morning.

When did the child die?—On the Friday night.

Cross-examined by Mr. McIntyre.

The child was never taken to Mr. Wiggins, as I understand you?—No.

Mr. Justice Field: Did you say anything more than this? "I said she had had a restless night, but she was not quite so feverish." Did you tell him anything more about her symptoms?—I only told him that she had a very restless night, and I thought she was no better.

Did you describe any symptoms?—That was all after what mother described about her.

Mr. Morgan Howard: I have omitted one question which I ought to have asked, my Lord.

Mr. Justice Field: Very well.

Mr. Morgan Howard: When you asked him what he was treating your child for did he look at a book?—He did.

He looked at his book?—Yes, before he could tell me.

Then he said what?—Scarlet fever.

Mr. McIntyre: What sort of a book was it that he looked at?—I could not say, but I believe it was a long narrow book.

Was it a thin book, or a thick book, or a printed book, or what. Did you see that?—No, it looked like a book that he always put his medicine in.

Mr. Justice Field: A prescription book.

Mr. McIntyre: A day-book.

Mr. Justice Field: Or a copy of the prescription.

Mr. McIntyre: Before you sent for Dr. Cooper, had the child's throat swelled?—Not that I noticed, I do not know that it ever swelled at all, she was having poultices on her throat all the time.

When?—All the time she was ill.

Before your mother went to see Mr. Wiggins?—At the time.

At the time your mother went to Mr. Wiggins she had poultices on her chest?—Yes. Mr. Wiggins prescribed it.

After your mother came back from Mr. Wiggins they were put on the child's chest and kept on?—Yes.

How long had your child been ill before your mother went to Mr. Wiggins?—Only that morning.

When was your attention first called to this after that?—I do not remember whether there was a call before last August.

That was about the time when this was proceeding, the 28th of August. Who was it that called?—A gentleman who is here in court now.

Who is he?—There he is.

Mr. Justice Field: I should like to ask Mrs. Leggatt a question.

Mrs. Leggatt recalled. Examined by Mr. Justice Field.

Will you try and remember what it was you said to Mr. Wiggins when you saw him on the Monday about the child's state?—No I cannot.

Have you told me all you told him?—Yes.

All you told him was that she had a violent cold?—I told him I thought so.

And that she had been very sick?—Yes.

You did not describe any other symptoms at all?—I might have said that she had a headache. That I cannot say.

Had she any rash on her?—No.

When did the rash come out on the child?—I cannot remember.

Did you see the child before you went to Mr. Wiggins?—Yes.

At that time was there anything that you can remember that you told him of?—No.

Mr. George Joseph Cooper sworn. Examined by Mr. Gore.

Are you a member of the Royal College of Surgeons and have you practised for some time past at 9, Linden Villas, Blue Anchor Road, Bermondsey?—I have.

Do you recollect Mrs. Bennett, the witness called here to-day, bringing a child to your surgery in January, 1877?—She called on January the 4th.

Mr. Justice Field: Did she bring a child or not?—She brought the child.

Mr. Gore: Did you examine the child?—I did.

Did you ascertain what the child was suffering from?—Acute bronchitis.

Mr. Gore: What stage was it in of that disease?—An advanced condition.

I believe as a matter of fact it died the next day?—It died on the 7th.

That would be three days after you saw it on the 4th?—I told the mother it would die when I saw it.

From its condition on the 4th when you saw it could you say how long it had been suffering at all from this disease?—Several days.

Was it suffering from a serious disease?—Yes.

Mr. Justice Field: You said acute bronchitis. Acute advanced bronchitis.

Mr. Gore: Did it require medical skill and attention.

Mr. Morgan Howard: I think we may assume that it did.

Mr. Gore: Do you recollect also seeing a child of Mrs. Culverwell, a witness who has been called here?—I saw her on September 16, 1876.

Will you tell us what it was suffering from?—I examined that child, and found it was suffering from an advanced state of pneumonia—inflammation of the lungs.

From what you saw, Mr. Cooper, can you tell us whether it had been so suffering for a considerable time?—For four or five days.

Is pneumonia a serious disease?—Very serious.

Do you recollect a child of Mrs. Loades being brought to you or did you go to see it?—I was called to see it.

When was that?—On the 31st of March, 1876.

What was the child suffering from?—Dying of scarlet fever.

Mr. Justice Field: Dying from what?—Scarlet fever.

Mr. Gore: Was it a bad case of scarlet fever?—Yes, a very severe form.

How long did it appear to you to have been suffering when you first saw it?—From the condition of the throat I should say four or five days.

It did die, I think?—Yes; a few days after I saw it.

I think you have given us the date on which you went.—Yes.

I do not know if you saw any other child that has been mentioned to day.—No, I did not.

Cross-examined by Mr. McIntyre.

You have not given us your qualification.—I am a Member of the Royal College of Surgeons, and Licentiate of the Apothecaries' Society.

Have you been at all active in getting up this case?—Not at all.

Or in giving any information?—I certainly gave the information of these three cases.

To whom?—To the late Dr. Reed.

To a Mr. Lingford?—No, to Dr. Reed.

When was that?—I cannot tell the date, it was sometime in the autumn of 1877.

The cases occurring, two of them at all events, in 1876, What was Dr. Reed?—He was a medical man living close beside me.

A neighbour of yours?—Yes.

Was he anything else?

Mr. Justice Field; Was he a physician?—He was a Licentiate of the College of Physicians of Edinburgh and an apothecary as well.

Mr. McIntyre: And secretary of the Medical Defence Association?—I believe so, but I cannot say.

Did he keep a shop?—He had done so.

But he did keep the shop for selling patent medicines, did he not?—He had done so, he had put it down.

Mr. Morgan Howard: We should not object to that.

Mr. McIntyre: Now acute bronchitis does not always develope itself very rapidly, does it?—You can always tell the symptoms of it. The fatal symptoms develope themselves more rapidly.

Acute pneumonia. That is inflammation of the lungs, and it commences with a cold, and it may develop itself into pneumonia very rapidly?—I hardly know what you mean by "a cold."

I should have thought you would know it better than I do; you know what it is when a person catches cold. The first stage is catching a catarrh?—Medical men would examine the child's lungs. "A cold" is a popular phrase.

If you only had the report of the grandmother or the mother, you could not tell how long the symptoms had been developing?—Certainly; by the condition of the child.

Did you see the child before it was dead?—Certainly.

Re-examined by Mr. Morgan Howard.

Supposing a medical man had been applied to to see the child he ought to have seen it in the proper way?—Yes.

And have made a personal examination of the child? Yes.

Is Dr. Reed dead?—He is.

I do not know if you happened to see any of the physic that was given?—I believe Mrs. Loades showed me some, but I could not say what it was.

Mr. Morgan Howard:—That is our case, my Lord.

Mr. McIntyre: I should submit to your Lordship that there is no case to go to the jury. Your Lordship sees the penalties are sought to be recovered against the defendant, and what I submit to your Lordship is that the statement of claim both in substance and in words seeks to obtain the penalties against the defendant on account of his having acted and practised as an apothecary without such certificate, by attending, advising, and supplying medicines as an apothecary. Now, my Lord, first of all there is no definition, and my learned friend has not been able to show your Lordship one, of what is "acting and practising" as an apothecary, and as he seeks to recover penalties under this 20th section of the Act of Parliament, I submit to your Lordship that he ought to prove what is acting and practising as an apothecary, because as to giving medicines or compounding medicines, it is quite clear that physicians and dispensing doctors may do exactly what an apothecary may do in the mixing, preparing, and compounding medicines according to prescriptions.

Mr. Justice Field: But there is no prescription here at all you see. As the case now stands, a person goes into the shop, he does not produce any prescription, and he does not say, give me a liniment or a solution of magnesia or anything else, but says, my child is suffering from so and so, whereupon the defendant says, I will give her some medicine; or he is asked, will you give her some medicine, and he thereupon administers medicines in the one case, or powder and a draught. What they are composed of we do not know.

Mr. McIntyre: It may have been no more than a simple powder.

Mr. Justice Field: No.

Mr. McIntyre: I should submit to your Lordship that some discretion must be exercised by the person who gives the medicine. They have a right to sell the medicines.

Mr. Justice Field: I cannot tell. I tell you honestly that I do not know exactly what an apothecary means, and I do not know exactly what a druggist means.

Mr. McIntyre: And I do not pretend to know either.

Mr. Justice Field: You had better look at the Act of Parliament to see. I think the best thing we can do is to apply our minds and see what light the Act of Parliament throws on it. It is new to me as to the particular construction of it. The charter had its origin in those days when everybody who carried on a business was a member of an art and a society. It is just like the clothiers, and mercers, and tailors in the present day, they have exercised the art and they are combined in a craft. Now the people who carried on the business of the Society of Apothecaries are the plaintiffs here, and now let us see who the people were who were to become apothecaries.

Mr. W. McIntyre: They were at that time the same thing as the Company of Grocers.

Mr. Justice Field: Not at that time if you look at the Act.

Mr. McIntyre: I do not mean in 1815. I thought your Lordship meant earlier.

Mr. Justice Field: The foundation of the legislation was in the reign of King James I. I should have thought the better plan would have been to take the evidence. There may be one or two points of law arise, but I should not like to stop the case now.

Mr. McIntyre: As I am instructed I am anxious to get your Lordship's decision upon this as a point of law.

Mr. Justice Field: I cannot give it to you now. No power on earth could make me do that, as I do not understand it.

Mr. McIntyre: Your Lordship sees what I was saying about the grocers and apothecaries. I was quite right, for I hold in my hand the charter of King James I.

Mr. Justice Field: Never mind about the charter, take the Act which they are suing under, and look at the recital there: the preamble says this, "Whereas His Majesty King James I., by letters patent, under the great seal of Great Britain, bearing date the 6th day of December in the fifteenth year of his reign, did for himself, his heirs and successors, grant unto William Besse," who, I dare say, was a great apothecary in those days, "and divers others persons therein named, and to all and singular other persons whomsoever brought up and skilful in the art, mystery, or faculty of apothecaries, and exercising the same art, mystery, or faculty, then being freemen of the mystery of grocers," which exists now. Then, apparently, that was a sort of sub-faculty—it is a sub-faculty—attached to the grocers, which were known as those exercising the art, mystery, or faculty of the Society of Grocers; and then it goes on to say, "or being freemen of any other art, mystery, or faculty in the City of London (so as they had been brought up and were expert in the art or mystery of apothecaries)," so that there must have been at that time an art or mystery known as the art and mystery of apothecaries. That was done by the charter of James.

Mr. McIntyre: Yes, my Lord, that was done by the charter of James, which recites that it is expedient to separate these apothecaries from the grocers.

Mr. Justice Field: Now I must look and see what they are to do by that charter. (His Lordship referred to the charter.) Nobody asks whether or not this gentleman had anything over his door or over his shop. That is curious enough because the word apothecary after all only comes from the root of a Greek word, which is a deposit, or the place of deposit, and you know in Germany you always see "Apotheke" written up, which is the same thing. The monks were the original apothecaries in the world; they dispensed their medicines, and they still do so at the monasteries. Then we hear there was a certain Society of Apothecaries. Now what definition is there of apothecaries. Have you looked at the dictionary to see what it means?

Mr. Morgan Howard: It comes from the Greek word.

Mr. Justice Field: I know it does. I will refer to Webster's Dictionary and see, but I cannot say at present but what there is really evidence. I do not know what apothecary means, but I am inclined to think it may be something of that kind.

Mr. Morgan Howard: There is a case of Apothecaries' Company *v.* Allen, 4 Barnewell and Adolphus.

Mr. Justice Field: Is that the case in which it was said that the very fact of his coming with the prescription and could not make up the prescription was strong evidence that he was acting as an apothecary.

Mr. McIntyre: Yes, my Lord.

Mr. Justice Field: I say there is evidence for the jury as to the acting as an apothecary, but I will take a note of your point.

Mr. McIntyre: I call your Lordship's attention to this Act, and I want to have this section on your Lordship's note now.

Mr. Justice Field: I will give you the benefit of it at the end of the case. In the old days I should have said to you I will not stop the case, but give you leave to move. At present I reserve the benefit for you.

Mr. McIntyre: Will your Lordship also take a note of this case?

Mr. Justice Field: Yes, I will put the bane and the antidote side by side.

Mr. McIntyre: It is the Attorney-General against the Royal College of Physicians, 30 Law Journal, Chancery, New Series. The judgment of Vice-Chancellor Wood is at page 765, and there he speaks of what is the practising as a physician or practising as an apothecary.

Mr. Justice Field: I do not understand practising a business. I can understand carrying on a business, and in that business you may do two things: you may sell any one of those numerous things which a newspaper invites me to buy every day, namely, patent medicines, which you can get at a chemist's, but that is not practising it. I understand a practice to mean a practice of a barrister, or a solicitor, or a surgeon, or an apothecary. That is what I understand to be a practice of an apothecary. Well, it would not pay for a man to practise a pure apothecary's business, and so he combines with it the sale of every species of things that people are likely to want in that order of life, and who come to him for medicines and he sells them. That is clearly not practising as an apothecary. He also sells cigars, and lemonade and soda water. The question there is if it does not come within the Refreshment Act.

Mr. McIntyre: I cannot say, my Lord.

Mr. Justice Field: And he sells strengthening medicines which he gives you in the morning.

Mr. McIntyre: Then there is the 15th section.

Mr. Justice Field: "And whereas it is the duty of every person using or exercising the art and mystery of an apothecary to prepare with exactness"—that you are entitled to—"to prepare with exactness and to dispense such medicines as may be directed for the sick by any physician."

Mr. McIntyre: That clearly a chemist may do.

Mr. Justice Field: That indicates what a chemist is.

Mr. McIntyre: If that is so a chemist clearly may act.

Mr. Justice Field: Without a certificate?

Mr. McIntyre: Certainly. The 15th section seems rather to point out that the duty of the apothecary is to prepare with exactness, and to dispense such medicines as may be directed for the sick by any physician, and it imposes a penalty on him if he does not do it. And then it goes on "That if any person using or exercising the art and mystery of an apothecary shall at any time knowingly, wilfully, and contumaciously refuse to make, mix, compound, prepare, give, apply, or administer, or any way to sell, set on sale, put forth, or put to sale to any person or persons whatever any medicines, compound medicines, or medicinable compositions, or shall deliberately or negligently, falsely, unfaithfully, fraudulently or unduly make, mix, compound, prepare, give, apply, or administer, or any way sell, set on sale, put forth, or put to sale to any person or persons whatever, any medicines, compound medicines, or medicinable compositions as directed by any prescription, order, or receipt, signed with the initials, in his own handwriting, of any physician."

Mr. Justice Field: That is for the further security of the subject. There the obligation is put upon him.

Mr. McIntyre: Yes, that he shall prepare according to the prescription of the physician.

Mr. Justice Field: That does not limit him.

Mr. McIntyre: Then the 20th section is the penalty section. "If any person (except such as are then actually practising as such) shall after the first day of August, 1815, act or practise as an apothecary in any part of England or Wales, without having obtained such certificate as aforesaid, every person so offending, shall for every such offence forfeit and pay the sum of £20, and if any person (except such as are then acting as such, and excepting persons who have actually served an apprenticeship as aforesaid) shall after the first day of August, 1815, act as an assistant to any apothecary, to compound and dispense medicines without having obtained such certificate as aforesaid, every person so offending, shall for every such offence forfeit and pay the sum of £5." Then there is the 28th section: "Provided, and it is hereby enacted that nothing in this Act contained shall extend, or be construed to extend, to prejudice or in any way to affect the business of a chemist or druggist in the buying, preparing, compounding, dispensing, and vending drugs, medicines and medicinable compounds wholesale and retail; but all persons using or exercising the said trade or business or who shall or may hereafter use or exercise the same shall and may use, exercise, and carry on the same trade or business in such manner, and as fully and simply to all intents and purposes as the same trade or business was used, exercised, or carried on by chemists and druggists before the passing of this Act." Now your Lordship sees that they are allowed to buy, to sell, to prepare, compound, and to dispense medicines, that is they may prepare and compound, and when it is prepared and compounded they may dispense it. Now what I submit to your Lordship is this, that all that is proved here is at the outside the preparing, compounding, and dispensing.

Mr. Justice Field: And the vending.

Mr. McIntyre: Yes, and vending.

Mr. Justice Field: And he advised patients, and he made up and sold to them the medicines which he himself ordered.

Mr. McIntyre: Yes, my Lord. He was not a chemist, as your Lordship remembers. There is only a reservation in favour of chemists.

Mr. Justice Field: Yes, he did not come within the exceptions. At present, if you will forgive me, you are putting the two things together which I want to keep separate. They are quite separate. You are now submitting to me that there is no evidence that he practised as an apothecary.

Mr. McIntyre: Yes, my Lord.

Mr. Justice Field: Then what I say is in this particular case we will see what he did do.

Mr. McIntyre: I think you will find he visited.

Mr. Justice Field: Let us see what he did upon the evidence. Fanny Grist is the first witness. She says, "I said will you give me a little medicine for my child. He said, Yes, I will, but what are the symptoms? I told him I gave her a spoonful of castor oil in the morning; she had been very bad all day. I thought she was going into convulsions. He examined her and said, I think so, too. He made her a bottle of medicine and gave a powder." That is the evidence to go to the jury, as to the acting as an apothecary.

Mr. McIntyre: As far as the term "apothecary" is shown in the 15th section, it is preparing and compounding medicines according to prescription.

Mr. Justice Field: But he prepared it without a prescription. That is the thing it is directed to. If he prepared it with a prescription nobody would have found fault with it.

Mr. McIntyre: The writing down does not matter to the chemist. Supposing an unqualified person went into a chemist's shop and said, "I want you to prepare for me a pill, say compound extract of colocynth and blue pill.

Mr. Justice Field: If you tell him to prepare what you want he is merely selling it; if you say you want a round pill of so many grains of this and so many grains of the other, he is only selling it.

Mr. McIntyre: Yes, my Lord. Suppose two men of different temperaments go and say to him, "I want a colocynth and blue pill," to one he would give one quantity of mercury, and to another, another.

Mr. Justice Field: I think he would be in some danger.

Mr. McIntyre: But is he to do this, to put a lump of colocynth before him and say to him, "Break off a bit of the colocynth, I will weigh it for you; then break off a piece of blue pill and I will weigh that," or is he to use some discretion in the matter?

Mr. Justice Field: Tell me a case which you think comes within the Act.

Mr. McIntyre: I think persons who visit patients—who do not merely sell in the shop and dispense across the counter, but who go visiting the patients, seeing about their ailments, and then prescribe and have the medicines made up.

Mr. Justice Field: That will not hold. Supposing instead of going visiting, a gentleman put up a notice outside the door, "Dr. So-and-so will see patients from 10 to 11 on Monday morning;" and every mother in the neighbourhood brought her child there?

Mr. McIntyre: It would be holding himself out as a person to be consulted.

Mr. Justice Field: Would that be a case within the Act?

Mr. McIntyre: I do not go beyond dispensing across the counter; I do not go further than that.

Mr. Justice Field: It is a question of the character of the act. I will not stop the case, but I will give you all the benefit of it. If you wish to argue the point whether there is any evidence to go to the jury or not, I will give you the benefit of it.

Mr. McIntyre: Whether within the meaning of Mr. Justice Cresswell's decision in the case in the Queen's Bench, there is evidence of his acting and practising as an apothecary.

Mr. Justice Field: I think in that case you will find he did visit patients. He lived in lodgings, and he did not make up physicians' prescriptions, and he could not do so. He advised patients, and made up and sold to them the medicines which he had ordered. Mr. Justice Cresswell said a man compounding medicines and selling them under those circumstances did act as an apothecary in the ordinary sense of the word, and it made no difference if he prescribed as well as prepared the medicine. You are rather bringing into your mind the 28th section as bearing on this case, but the question simply is, did he practise as an apothecary?

Mr. McIntyre: I think upon the facts he visited patients.

Mr. Justice Field. I do not think so in the report which I have. I have no doubt he did. Now let us see what an apothecary is. An apothecary is one who practises pharmacy, one who prepares drugs for medical uses and keeps them for sale. He prepares them for the use of himself.

Mr. McIntyre: And every dispensing chemist does the same thing.

Mr. Justice Field: You are running your head against the exception.

Mr. McIntyre: I contend it must be something peculiar to an apothecary that he should do a particular thing. But a chemist does the same thing. He prepares medicines in the same way.

Mr. Justice Field: There is no magic in the word "Chemist." Mr. Huxley is a great chemist, but he does not do the one thing or the other. You have got first of all to consider the existing class. You are now contending that there is no evidence to show that he acted as an apothecary, and if there is you are protected by the 28th section, which is quite a different question, which we can deal with when it comes.

Mr. McIntyre: I do not call the doing of anything under the 28th section a practising as an apothecary. It is part of the thing which an apothecary does. The acting and practising as an apothecary means the act of preparing and dispensing.

Mr. Justice Field: I shall not stop the case on that point.

Mr. McIntyre: No, my Lord. One might make up medicine and give it away.

Mr. Justice Field: What does the defendant charge sevenpence for?

Mr. McIntyre: For the medicine itself.

Mr. Justice Field: I shall ask the jury about that.

Mr. McIntyre: Where he gave no medicine, he charged no price.

Mr. Justice Field: I shall not stop the case for that.

Mr. Morgan Howard: There is another case, my Lord, of Morgan *v.* Halliman, 8 Adolphus and Ellis, 489.

Mr. Justice Field: Every man who does a thing charges for it. It is like the case of the railway companies who used always to say "We do not make any charge for delivering your goods."

Mr. McIntyre: Yes, my Lord, "We do not make any charge for your using the station, but we make the charge for carrying you."

Mr. Justice Field: Every man who gets a reward for a compound act puts into his price in some way or other the trouble which he takes in the act. If he is a great man he puts in a good deal, and if he is not he puts in less. Every man charges something. If he has to hand over blocks of soap, he charges something.

Mr. McIntyre: Yes.

May it please your Lordship, gentlemen of the jury, my Lord has ruled that this is a case for your consideration, and I shall not occupy your time very long in asking you to come fairly and properly to consider what is the real question to be determined here.

Mr. Morgan Howard: There is another case, my Lord, of Ellison *v.* Haydon, 4 Bingham's Reports, 621.

Mr. McIntyre: This is an action that was commenced by the Society of Apothecaries through a local protection society against the defendant for the infringement of this Act of Parliament, and before you can find your verdict for them and make him liable for these penalties it must be most clearly and distinctly proved to your satisfaction that he has infringed this Act of Parliament by doing what he has done, and you will not strain the Act of Parliament so as to prevent the chemist, who has medicines and who prepares those medicines, from dispensing, as he has a perfect right to do under the 28th section, to which I have called my Lordship's attention, and which I shall dwell on in addressing you, he has a right to dispense these medicines, and in this case the present defendant has not gone beyond that right.

Now, the first thing they have to make out, is, that he has in the words which they have put into their statement of claim, acted and practised as an apothecary by attending, advising, and supplying medicines as an apothecary. They do not venture to leave it there, and to say that the attending, advising, and supplying medicines would make him liable under the Act of Parliament, but they add the words which they are compelled to add, in order to make out that case, that he attended, advised, and supplied medicines as an apothecary. Now, the attending, advising, and supplying medicines as an apothecary, is protected by that Act of Parliament, and the apothecary gets his fee and reward for that, and until a very recent Act of Parliament was passed, the apothecary was the only man who could recover for the supply of the draughts.

Now, gentlemen, let us see what an apothecary is. We cannot find a definition in the Act of Parliament. Then let us see what an apothecary does. From the last case which my friend cited, it is pretty well to be seen what an apothecary does. He sees patients; he goes about and sees patients; he advises those patients and he makes up the medicines for them either from his own prescription, or as he is compelled by the Act of Parliament, to carefully and accurately make up the prescriptions sent to him by physicians. Now, what do chemists do? and what have they a perfect right to do? If a physician writes a prescription, and you take that to a dispensing chemist, he is bound to make up that prescription, and to make it up with accuracy and precision, and to bring a competent knowledge of the drugs and the way in which they are compounded and prepared for the purpose of enabling him to make up that prescription. That would seem to be within the scope of what the 5th section of the Act of Parliament is. That seems to be one of the great duties of an apothecary. Nobody would suggest, and my friend would not, that a dispensing chemist is not entitled to make up the prescriptions of medical men which are brought to him, and dispense them by handing them to the persons who come with them. They are entitled to mix, make, and compound medicines, and when they are compounded they have a right to vend them, and the person who is to receive them can receive them across the counter and can sell them. I take it that a chemist by reason of the knowledge acquired in his business, and the knowledge which he acquires by having the prescriptions of eminent physicians brought before him, gets to know the prescriptions, and is enabled to make up the compounds which physicians order for particular cases. Take the case of bronchitis. A case of bronchitis has been treated by an eminent physician, whose prescriptions come to the chemist's shop. The chemist makes up the prescription which is given by the physician. The person comes backwards and forwards to the chemist and he discovers that that person is entirely cured, and is cured by the medicine which had been prescribed by the physician. He chooses from that to keep that medicine in stock, made up ready mixed, and in a bottle, to be sold for a price which he may fix upon it. A man comes and says to him, "I am not well; I have got a bad throat, it is bronchitis." Is the chemist, then, or is he not, entitled to take down that bottle of medicine which he has prepared from the prescription of the physician, and hand it over to him and receive the 1*s.* 6*d.*, or 1*s.*, or 7*d.*, or whatever it is which he is to receive? Now, supposing he is entitled to do that, and I submit most strongly in point of fact, and in point of law, that he is, and supposing he is out of that mixture, well, cannot he then go to the different bottles and mix them up into the one bottle that which he is going to give him, viz., the mixture which the man is to take away? If it is an infringement of the law, and my Lord will give you directions on that point, why, you will give your verdict against the defendant, but you will not strain the law. You would rather take care that those who have to make out a case which would prevent a valuable business, made valuable to the public and more valuable to the poorer members of the public, should do so, and I say you will not let that business be stopped unless you are clear that it is an infringement of the Act of Parliament.

Now in this case what do we find? A woman comes and says she wants something given to her for her child; something is given, the child gets worse, and she consults Dr. Cooper. Now what she says is she could not consult him first, because she had not got the means of paying him. She went and she got the money, and although she had not the means of doing so before, her case is this. He sees the child, and he prepares the medicine which is to be given to the child, and she takes the medicine away with her. I put it to you that it is a matter of discretion as in everything else. Supposing a person came and said to you, "I want this or the other particular article," you might then recommend another.

Mr. Justice Field: But that is not the case in point.

Mr. McIntyre: I am not taking it as a peculiarity but as an illustration. Supposing a person goes to a tea merchant and says, "The tea which I have had of you gives me a headache, cannot you recommend me a good wholesome tea that would not give me a headache?" Here the person goes to the chemist's shop and says, "My child is ill—my child wants some medicine." Very well, here is the chemist, who is empowered, and always has been, as I shall show you by evidence which I will call before you of persons who were in practice before the year 1815, that chemists had the right before the Act of Parliament, and it has clearly not been taken away by the Act of Parliament, to make, mix, compound, dispense, and vend medicines. He says, "Your child is not well; what is is the matter with him?" The child has a bad cold. "Very well, I will give it one of my compounds that I use for the purpose, and which has been very successful in treating colds." And if the medicine is made up he gives it, and he mixes it if it is not made up. That thing might be done, and he must have some discretion left to him, because he has a knowledge of drugs and would know better than the other person who came to him what is best for the child. Now what is he to do if a man comes and says, "I want a pill?" He says to the man, "What sort of a pill do you want?" The man says, "I do not know the names of the drugs. I cannot tell what sort of a pill I want, but I want an opening medicine." He says, "Very well, I will give you an opening medicine," and he compounds two things together, and having done so, he gives the man the pill and the man takes it away. I shall contend most strongly, in fact and in law, that is not acting as an apothecary, but doing what he has a right to do, to mix, dispense, and vend, and that is all he does do. But he also must exercise his discretion in vending the medicine that he does not give it too strong. Supposing a strong hearty man came into a chemist's shop and says he wants an aperient pill given him. The chemist gives him a pill of a certain size and strength. Perhaps he will give him a five-grain pill, three grains of compound extract of colocynth and two grains of blue pill, and he gives him that and that will do him good. But a child is brought to him and the child is suffering from the want of an aperient. Gentlemen, he would not give the child a pill of the same strength; he would not give him one mixed so that it would act so strongly on the organs of the child, but one that would do the child good. But what is he to do if my friend is right? He is to say, "You want an aperient mixture; I have a dozen different sorts; you take what you like; I will weigh it and then I will tell you what it will come to." That would be a perfect absurdity, and unless you go to that extent—and I will submit you must not go to that extent—when a person comes to a chemist's shop for the purpose of purchasing a mixture of that chemist, the chemist has a right, while he is in the shop mixing, vending, and dispensing his mixtures, to ask the nature of the complaint from which the person is suffering, so that he can administer and dispense the proper mixture which would be proper and valuable for the purpose for which it is wanted by the patient who is suffering. Supposing a person says "I want some medicine, it is to be an astringent medicine." Is he to be given salts and senna. The man does not know what is best. He knows he wants medicine and he goes to the chemist's shop for the purpose of buying it, but according to my friend's account that is to be entirely stopped, and they are to be able to say that no mixture shall be dispensed except by an apothecary, or if it is otherwise it must be given by a chemist upon the prescription given by some medical man. I contend that that is going far beyond what the Act of Parliament intended. The scope of the Act of Parliament is shown first of all in the section of the Act of Parliament which compels them, and puts them under penalties and liabilities unless they do it, to carefully and accurately make up physician's prescriptions. There is nothing in that Act of Parliament, and I think when my Lord comes to read it he will tell you that this is distinguished in the Act of Parliament which defines the giving a patient advice as being the meaning which a man is to have who is acting as an apothecary.

Mr. Justice Field: I want to draw your attention to this so that you may know what I am going to call their attention to by and by. I should like you to look at section 7.

Mr. McIntyre: I will read it:—"And whereas much mischief and inconvenience has arisen from great numbers of persons in many parts of England and Wales exercising the functions of an apothecary, who are wholly ignorant and utterly incompetent to the exercise of such functions, whereby the health and lives of the community are greatly endangered, and it is become necessary that provision should be made"——

Mr. Justice Field: The rest is nothing. Now, I want to draw your attention to this:—that the intention of the Act is to show what the apothecary does as distinguished from the chemist.

Mr. McIntyre: The way in which I read it is to protect the qualified medical practitioner against the unqualified medical practitioner, viz., the quack. He need not dispense medicines, but he can give his advice or he can make them up, he not being a duly qualified person.

That is how I should look at the first part of the section of the Act of Parliament. That is how it seems to me to show what the scope of the section of the Act of Parliament is. It is clear that if persons only make up one medicine or one sort of medicine, that they may always, without being an apothecary at all, go and dispense this medicine as much as they like. For instance, take Morrison's pills,—Morrison's pills No. 1, and Morrison's pills No. 2. A person would go to get Morrison's pills. For one state of symptoms Morrison's pills No. 1 would be given; for another state of symptoms Morrison's pills No. 2 would be given. Is not Morrison to ask what are the symptoms, or whether he is to sell him pills No. 1 or pills No. 2. According to them he could sell both, and if he sells both and asks no questions, no offence is committed; but if he asks what his symptoms are, so that he can give him the right pill, the one that will do him good, they say because you sell him the right one and not the wrong one, you infringe the Apothecaries Act. I put this limit on what I say the chemist may do, and in whatever the chemist may do there is not an infringement on the Apothecaries Act. When persons come to him for the purpose of preparing medicine, he may put the necessary questions to them to know which of his medicines he is to make up, mix and dispense to him. But he must not go beyond that. Afterwards, the person or person's friends say that this has done him so much good that he wishes for another, and he hands one across the counter to that person. I say that that would merely be dispensing and vending the medicine within the meaning of the section of the Act of Parliament.

Now with respect to this particular case, it is not taken as against Mr. Wiggins for anything that he has done, particularly here, but it is this. It is a sort of test case for the purpose of defining what would be an infringement of the Apothecaries Act of Parliament, and if you, upon the evidence such as there has been laid before you to-day, come to the conclusion that Mr. Wiggins has infringed the Act of Parliament, every single chemist who asks a person who comes to him for a cold, how long have you had the cold, or whether it is a cold in the head or a cold in his chest, every one who asks that question before he dispenses the cough mixture is an infringer of the Act of Parliament, and he can be proceeded against for the penalties. And the whole of the trade which is carried on, which is of great advantage by dispensing the medicines to, and charging for them alone to persons who do not think they require a physician—the whole of that would be stopped.

Mr. Justice Field: No, apothecaries can do it. Any apothecary may do it.

Mr. McIntyre: I say it would stop the whole of the business of a chemist who does it, but an apothecary is a medical man, charging his professional fee as well as for his medicine.

Mr. Justice Field: I cannot see how that enters into the question. Does it matter whether poor or rich people go to him? It may be a good reason why in the House of Commons they might wish to alter the law, but it cannot affect its construction.

Mr. McIntyre: I say when it is such as the result would be here, one ought to look very narrowly to see whether the case is proved. and see whether it is within the scope of the Act of Parliament.

Mr. Justice Field: The plaintiff must prove his case, whether it is an action for £5 for goods sold and delivered, or for a £10 penalty. The plaintiff must prove his case in both cases.

Mr. McIntyre: No doubt; but where, in a case like this ——?

Mr. Justice Field: If a case is proved, that is the only question. I cannot see why it is to be proved more in one case than in the other; the question is, has he proved it sufficiently for £5 for goods sold and delivered, or for a £10 penalty. I do not understand that there is any greater degree of proof in the case of a penalty than in anything else. I shall have to tell the gentlemen of the jury what the law is, and they will have to find the facts. Whether it was the question of a duke or a peasant I should say the same thing.

Mr. McIntyre: No doubt in one sense I quite accede to what my Lord says, but it was not in that sense that I was using the words, but I say where there is evidence both ways, and it hangs in the balance to a considerable extent, at all events, although it might be thought there was a little more evidence on the one side than on the other; I say unless it is completely proved, and not disproved, by the evidence which I shall lay before you, the verdict ought to be for the defendant. Under the 28th section I shall have a body of evidence to lay before you. That would consist to a considerable extent, of chemists who were in the practice or in the profession, or in chemists' shops before the year 1815, and they will tell you most distinctly that before this Act of Parliament passed in 1815, chemists were in the habit of having persons come to them in their shops telling them what their ailments were, and when they told them what their ailments were, the chemist made up, dispensed, and handed over to them their medicines.

Mr. Justice Field: I shall want you to satisfy me that your construction in your statement of defence of the 28th section is the true one.

Mr. McIntyre: I will address the jury on that part of the case to-morrow morning, my Lord.

At this point the Court adjourned until the next morning.

At the sitting of the Court on the next day the proceedings were continued—

Mr. McIntyre: May it please your Lordship, gentlemen of the jury, I was just coming to that part of the case to which the 28th section of the Act of Parliament applies when the court rose yesterday. Let me just put to you the distinction that I draw between the two parts of the case, because I understand from my Lord that probably two questions will be put to you.

Mr. Justice Field: I propose to ask the jury whether or not the defendant acted as an apothecary, using the words of the statute, and also within the meaning of the words, with the admission put upon it, in the statement of claim. When I have heard the nature of your evidence I will give my construction of the 28th section, because if my construction is adverse to you it is no use my listening to the evidence.

Mr. Morgan Howard: I was going to submit a proposition on that very point, but I will reserve it till later on.

Mr. Justice Field: You had better wait till the evidence is tendered.

Mr. McIntyre: Gentlemen, my Lord will ask you the question whether the defendant in this case acted and practised as an apothecary, because those are the words upon which he must rely. Upon that I shall submit to you, and my Lord, that acting and practising as an apothecary means more than doing something which an apothecary does. For instance, in one of the cases which my Lord read yesterday it was decided by one of the judges that preparing medicines according to the prescriptions of physicians, or other persons, was acting as an apothecary. I say that you must find that he is acting and holding himself out as an apothecary, and that he is not acting and holding himself out as a chemist. It must be something that an apothecary does, and that no one else but an apothecary may do. Unless that is made out to your satisfaction you must come to the conclusion that this man—although he was doing what an apothecary does, and what by the 5th section of the Act of Parliament an apothecary is bound to do, under a penalty if he does not do it, that is, to make up the prescriptions of other people—was acting as a dispensing chemist, and not as an apothecary. A man may act as an apothecary by holding himself out to the world as a chemist and druggist, and if he does that he comes under the Act of Parliament. If, on the other hand, he makes up medicines according to prescriptions given by physicians, it is clear that an apothecary may do that. I submit to you that acting and practising as an apothecary in order to bring him within the penalty clause he must do the whole of the things that an apothecary is bound to do, and the things that a chemist is not entitled to do.

Mr. Justice Field: I do not quite follow you.

Mr. McIntyre: I put it in this way; it is conceded, but I will prove it if necessary, that it is part of the business of chemists and druggists to mix medicines, and to make up prescriptions that are prescribed by medical men, either surgeons or physicians.

Mr. Justice Field: If a doctor gives a prescription you take it to your druggist and he makes it up.

Mr. McIntyre: Yes.

Mr. Justice Field: I want to see how far I can follow you. "Druggist" is an old word, but "chemist" as applied to this, is a new word.

Mr. McIntyre: Yes.

Mr. Justice Field: A druggist in olden times was a person who supplied the drugs to the apothecary. There were druggists, apothecaries, physicians, and surgeons—four existing professions or businesses in olden times. Now, the modern chemist and druggist is a man who confines himself to vending, preparing, and compounding medicines.

Mr. McIntyre: And dispensing.

Mr. Justice Field: Selling.

Mr. McIntyre: Dispensing, my Lord.

Mr. Justice Field: You take the prescription to the chemist, and he dispenses or vends the medicines according as that may be. It is clear from the language of Baron Parke, and from history itself, that the apothecary in 1815 had the duties which he had before, but that he was put under certain penalties.

Mr. McIntyre: The Apothecaries' Society by the Charter of James had the sole right to sell within seven miles of London.

Mr. Justice Field: That was a monopoly; how far they had it in point of law is not necessary now to decide. No doubt the apothecaries had, between the Charter of James and 1815, acquired a right of visiting and seeing patients. I dare say Mr. Howard will concede that; but then the question is whether the statute of 1815 interferes with that right.

Mr. McIntyre: The way I put it before your Lordship is this, they were acquiring this right ——

Mr. Justice Field: Do not call it a right.

Mr. McIntyre: A practice. While they were seeing their patients out of doors, and visiting patients, the practice was growing up by which a body acting with the chemists came into play, and they were the persons who dispensed the medicines in their own shops according to the prescription sent by physicians, surgeons, or apothecaries who had a visiting business.

Mr. Justice Field: An apothecary not only visited his patients, but his patients visited him, and he dispensed his own medicines; but he does not now.

Mr. McIntyre: It is not necessary now, because a man who has a large visiting practice out of doors writes his prescriptions, although he may be a licentiate of the Apothecaries' Company. They do not dispense the medicines prescribed by physicians and surgeons. That has departed from them in practice to a great extent, if not entirely.

Mr. Justice Field: What has?

Mr. McIntyre: Dispensing the prescriptions of other medical men.

Mr. Justice Field: I see what you mean now.

Mr. McIntyre: Virtually he has ceased to make up the prescriptions of physicians and surgeons. Then before 1815 there sprang into existence this body of chemists and druggists to whom the prescriptions of physicians and surgeons were taken, and they made up those prescriptions for them, and handed them or sent them, according to directions, to the house of the patients. Before 1815 also this further practice had grown up, that a person who came to the shop of the chemist or druggist would there receive from him across the counter a mixture as a remedy for the complaint under which he was suffering.

Mr. Justice Field: That is the practice which this action is intended to strike at.

Mr. McIntyre: Counter prescribing is a well-known term amongst chemists and druggists, and has been in existence before the year 1815. I should submit to your Lordship that one form of counter prescribing is prescribing across the counter by making up the prescriptions of a physician or surgeon. That is one mode.

Mr. Justice Field: I should not call that counter prescribing.

Mr. McIntyre: It is dispensing. The second mode is that when a person has come without a prescription from a medical man, and tells the chemist that he requires medicine, the custom has been for the dispensing chemist or druggist to ask him the symptoms of what he is suffering from, a cold or whatever it is, and then to recommend him a medicine, charging him only for the medicine.

Mr. Justice Field: I have been into the shop of Mr. Pedler many times, and said "I do not feel very well this morning," and he has said, "Have you got a cold," I have said "I have a bad cold," and he has given me something. No doubt he is an apothecary.

Mr. McIntyre: He will be here to-day, and will say he is not.

Mr. Justice Field: This is a very extraordinary case, and as far as I can judge it is the first time this question has been raised, with the exception of the case of Allen.

Mr. McIntyre: The cases of Allen and Warburton were very unsatisfactory in this sense, that the Judges decided both ways; they decided that a man who was incompetent to make up the prescriptions of medical men before 1815, although he had been in the habit of prescribing, and making up his own prescriptions, was not in practice as an apothecary before 1815, but a man who did that after the Act came into operation was, as far as the penalties are concerned, acting as an apothecary.

Mr. Justice Field; This is the first case on the point.

Mr. McIntyre: It is the first case in which the principle is involved. There is a case of the Apothecaries' Company *v.* Greenhough, 1st Q. B. Reports, in which the Judges said, if this was to be relied upon it must be established by evidence.

Mr. Morgan Howard: There was a case in which I was concerned before Mr. Justice Lindley a short time ago. Mr. Justice Lindley took time to consider his judgment, and ultimately gave judgment for the plaintiff. He laid considerable stress on Allen's case, and came to the conclusion that the defendants had infringed the Act. The circumstances there were, that a person kept an open shop, circulated some pamphlets, and got people to call at his shop under an idea they were ill, when he took them into a little room, asked how they felt, then gave them some medicine, taking money for it.

Mr. McIntyre: That is a different case from this.

Mr. Justice Field: This is a very important case. No doubt the Apothecaries' Society wish to have this point decided, and it is a matter which I think should be properly considered. Mr. Wiggins, the defendant in this case, is not to be blamed at all for what he has done, because he has been doing that which has been done no doubt by all respectable people. But whether the law is just or not is not for us to consider. We must endeavour to find from the facts of this case whether the acting does come within the meaning of this section. Poor people cannot afford to go to men like Sir James Paget, and it is a very important thing no doubt for them to be able to go to some one who will attend to them cheaply. In the same way you might say a person could not afford to employ a gentleman of great eminence at the bar, and, therefore he might employ a gentleman who could do the work no doubt very well and at a cheaper price. I could not go into each individual case, and say I do not see why such and such a person should not address me as well as any one else. In that case the State considers the subject ought to have the guarantee of the State by the State prescribing a certain course of examination and qualification, and a register on which the qualified person should be put.

Mr. McIntyre: I should state to your Lordship that the facts proved by the witnesses for the plaintiff I shall not attempt to dispute. Though we might very likely on some little minor point have a contradiction of testimony, that is not what we want; we want to have the broad principle settled, and, therefore, I shall assume those facts to have been proved before your Lordship, and shall confine my evidence to the custom which existed before the year 1815.

Mr. Justice Field: It may be that you may show that a practice has prevailed before 1815, and a certain practice has prevailed since 1815, and it may be that Mr. Howard will not dispute the fact. Then it will resolve itself into a question of law.

Mr. McIntyre: Before you can find a verdict against the defendant, you must be satisfied that he has been acting and practising as an apothecary, that he has held himself out as a person entitled to act in the way that an apothecary can do, and not in the way that a chemist is entitled to do; in the way that I shall show you by and bye. The distinction, as I understand it, drawn by my learned friend is this, that if a man merely makes up the prescriptions that are sent in writing to him, signed by a properly qualified practitioner, the chemist and druggist is entitled to do that, and is not within the scope of the Apothecaries Act. Technically that would be acting as an apothecary, if it is said to be doing what an apothecary does, and what is laid down, that part of the business of the apothecary is the making up of those prescriptions. Then it it said that in addition to that, he has done something more. That he has used his own brains for the purpose of seeing what the proper thing to be given to the patient is, and he says that is beyond what the chemist and druggist has a right to do, and that it is trenching upon the province of the apothecary, and is acting as an apothecary. I submit that is not so. When a man goes into a chemist's shop, and asks for a medicine, he must go for one of two things; he must either say what the medicine is, and what quantity he requires, or if he does not do so, but says: "I want a bottle of mixture for a cough," is he to be left by the chemist to take the whole of it in one draught, or is the chemist to put it into a bottle with divisions upon it, or to write upon a label: "One sixth-part of this mixture to be taken three times a day?" I should submit most positively that a chemist has the power to do that. I do not think it will be contended on the other side, that if a man asks for a bottle of a mixture, it is not within the province of the chemist to tell him how much he is to take at the time so that he does not take an overdose. If he does that, is he not to be allowed to recommend that medicine which he thinks best for the purpose? A man comes and says, "I feel ill, and have a very bad cold." "Is it a cold in the head or chest? is it a tight cough or loose cough?" says the chemist. According to the way in which that question is answered the chemist gives him a bottle of mixture with directions upon it. So far, I think, you will be of opinion that that would not be trenching upon the apothecary's province so as to bring him within the words of the Act of Parliament, by acting as an apothecary and supplying medicines. He is entitled to supply medicine. He is entitled to dispense medicine. And if he is entitled to do so, may he not, when a man gives him an account of his ailment, across his own counter, decide what particular bottle he will take the medicine from? A man may say what his ailment is, but he cannot ask of the chemist what is good for it! If he asks for an effervescing draught is not the chemist to use such things as he thinks best for the purpose? If this case is to succeed, my friend must go as far as that. There are four cases before you, two in which the chemist did see the children and two in which he did not. In the two in which he did not see the children, the symptoms were described to him, and he supplied them with medicine. With regard to the other two cases, in one instance he looked at the child's throat and gave a mixture for that child, and in the case of the other child it is said he looked at its tongue and felt its pulse. He felt the pulse in order to see what the state of the child was, whether the pulse were high or low, and he looked at the tongue to see whether it was furred or not, and he gave to that child the medicine which was fit and proper for it. If those things, under the directions you receive from my Lord, make you think he was acting as an apothecary, I must say I shall be surprised, after the evidence which I shall lay before you. But without giving any evidence, I think I may say that telling the public what to do, and giving them the medicine that is capable of doing them good, is not acting and practising as an apothecary, as is required before conviction under the penalty of this section. With respect to the second point that arises under the 28th section of this Act of Parliament, the section being this, "Nothing in this Act contained shall extend, or be construed to extend, to prejudice or in any way to affect the trade or business of a chemist and druggist in the buying, preparing, compounding, dispensing and vending drugs, medicines and medicinable compounds, wholesale and retail; but all persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same, shall and may use, exercise and carry on the same trade or business in such a manner, and as fully and amply, to all intents and purposes as the same trade or business was used, exercised or carried on by chemists and druggists before the passing of this Act." The question is not whether rightly or wrongly, before 1815, chemists and druggists exercised the practice not only of making and compounding medicines, which clearly is not disputed, but of dispensing the medicine and advising the person who came to take the medicine at their shop what medicine would be the best for them, and across the counter giving those medicines. The year 1815 is a long time ago, but several of the gentlemen whom I shall call before you can very well recollect the year 1815, and were themselves assistants before that year and in that year, and their practice must have been a very salutory and healthy one to enable them to appear before you at the present time in a good green old age. In addition to those who can speak of that period I shall call before you Mr. Pedler, a well known gentleman, who says he has always done it, and that it had been the practice of chemists and druggists to carry on business in that way. If that practice had not been interfered with, or if interfered with, the interference had failed, then you will find the presumption of law that it had existed before that time. Supposing the Apothecaries' Company were to lie by till one hundred years after 1815, and then seek to stop any practice of this sort although it had been continued up to that time. Could they say you must call some one to prove that it was in practice before that time? Of course we could not do so, because the people would then be dead. But if we show that it had been done before 1815, and that this practice has been continued from then until the present time, I shall submit to you that you will find as a fact that the practice adopted by the defendant in this action is a practice, "as the same trade or business was used, exercised, or carried on by chemists and druggists before the passing of this Act," that is, by persons who were in practice before 1815. I shall prove these facts and ask with some confidence for your verdict upon all the points of this case.

Mr. Justice Field: I have an old case which I had better read to you of The College of Physicians *v.* Rose, reported in 3rd Salkeld, page 793. (His Lordship read certain passages.)

Mr. McIntyre: My Lord, that case was reversed in the House of Lords; the judgment is not given, but the case is set out in Brown's report. I have the Register here, and I find that the defendant, Mr. Wiggins, is regularly registered under the Pharmacy Act.

Mr. Morgan Howard: I do not dispute it.

Mr. Justice Field: Under what section is he registered?

Mr. McIntyre: Under the 31st and 32nd Vict., chap. 121, sect. 13, which is an Act to regulate the sale of poisons and to amend the Pharmacy Act of 1852. It brings him within the 28th sect. of the Act of Parliament as a chemist and druggist.

Mr. Justice Field: How does it do so?

Mr. McIntyre: Because he is registered as a chemist and druggist.

Mr. Morgan Howard: I admit that he is registered, and I pray that in aid rather of my case.

Mr. Francis Cupiss sworn. Examined by Mr. Higgins.

Mr. Morgan Howard: I think now is the proper time for me *pro formâ* to submit my objection to the admission of this evidence.

Mr. Justice Field: I would much rather see what the question put is, and then you can take the objection.

Mr. Howard: I desire to submit the objection which arises upon the Act of Parliament.

Mr. Justice Field: Take the objection when the questions are put.

I think you reside at Diss, in Norfolk?—Yes.

You completed your 80th year last April?—Yes.

In the year 1814 did you go to Mr. Woolrych, a chemist and druggist?—Yes; as an apprentice.

You were apprenticed to him for four years?—I was apprenticed at Uttoxeter.

Then you went to assist his son who was a chemist and druggist at Lichfield?—Yes.

In 1822 I think you attended at the Veterinary College in London?—Yes.

Mr. Higgins: You went through a course of lectures?—Yes.

In 1823 you went down to Diss?—Yes.

And carried on business there till 1874?—Yes.

Are you acquainted with the practice known as counter dispensing?—Yes.

Is that a practice which is carried on——

Mr. Howard: Do not lead the witness.

Mr. Higgins: I am not going to do so.

Is that a practice carried on by chemists and druggists?—Yes.

Was it so carried on when you first became acquainted with the business of a chemist and druggist in 1814?—Yes.

Mr. Howard: I think I am now bound to take objection. The witness is now speaking to a time subsequent to 1815, and the protection afforded by the Act had reference to all matters done before the passing of that Act. I submit no evidence is receivable here after the date of the Act of 1815.

Mr. Justice Field: Section 28 says, "All persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same shall and may use, exercise, and carry on the same trade and business in such manner and as fully and amply to all intents and purposes as the same trade or business was used, exercised or carried on by chemists and druggists before the passing of this Act." I think I must strike out that last answer.

Mr. McIntyre: He says he knows the practice since, and he knows the practice before.

Mr. Justice Field: You must keep yourself to what was the trade. I doubt whether that will not be too large, but I assume you propose to ask him, was the trade or business of a chemist or druggist so used, exercised, or carried on before the passing of the Act. Mr. Howard will object to that because it omits the important words of the section.

Mr. McIntyre: Suppose this action was being brought fifty years hence, no witness could be called to show what was the practice before 1815, because there would be no such person living, but it would be evidence of what the practice of chemists and druggists was, to go back as far as living memory could go, and show that this is the universal practice.

Mr. Justice Field: That may be so. I quite follow you. If I find you, or anybody, doing an act for the last twenty, thirty, or forty years, which may have a legal origin, I am bound to presume that it has had a legal origin. But here you are doing an act subsequent to the statute, which is prohibited by the statute, and you are proposing to show what was the business carried on before the passing of the Act?

Mr. McIntyre: I put it in this way before your Lordship, and I think you will see the reason of the thing. Before 1815, when this Apothecaries Act passed, the scope of the Charter was limited entirely to London, and seven miles round, that was the whole scope of its action. Throughout the whole country there was no Act prohibiting anyone practising as a chemist and druggist, or as an apothecary in that sense. In this Act of Parliament it said, "All persons who up to this time have been chemists and druggists, and all persons who after this time shall be chemists and druggists may practise," without limitation to any place at all, and carry on the business in exactly the way in which it was carried on before 1815.

Mr. Justice Field: Not within the seven miles.

Mr. McIntyre: Anywhere. This gentleman proves it beyond the seven miles.

Mr. Justice Field: It is, "practise not within seven miles."

Mr. McIntyre: I do not think within or without the seven miles has anything to do with it, because the Act of Parliament is universal, and therefore the same question will arise whether it was within seven miles or seventy miles. It was the charter which limited it to the seven miles, not the Act of Parliament. When this Act of Parliament passed it made all persons who had carried on the trade or business of a chemist or druggist before the date of the Act of Parliament entitled for all future time to carry it on in as full and ample a manner as they had done up to that time.

Mr. Justice Field: I think you had better ask the question so that it can be properly objected to.

Mr. McIntyre: Very well. He says he is acquainted with counter practice as it is now carried on by chemists.

Mr. Justice Field: Put some question which you mean to stand by, and then we will have the objection.

Mr. McIntyre: Do you know whether that practice existed before 1815.

Mr. Morgan Howard: I object to that question.

Mr. McIntyre: Now I am going to ask what that was?

Mr. Justice Field: We must know what the practice was before.

Mr. McIntyre: What was that practice.

Mr. Morgan Howard: I object to that question.

Mr. Justice Field: I will hear you upon that.

Mr. Morgan Howard: The objection which I now submit is this. By the fifth paragraph of the statement of defence, the defendants have pleaded that "Before the passing of this Act it was usual and customary for chemists and druggists in using, exercising and carrying on the trade or business of a chemist and druggist to prepare compound and supply medicines of their own selection in their own shops for the cure of simple complaints. That if he did attend, advise, and supply medicine (which he denies) he did so by preparing, compounding and supplying medicines of his own selection in his own shop for the cure of simple complaints in accordance with the use and custom aforesaid and not otherwise." This evidence is of course addressed to the exception which is supposed to reside within the four corners of section 28. When that is looked at I submit it clearly appears that the exception is limited to the trade or business of a chemist and druggist as to certain particular matters which are there specified. They are thus specified: in the buying, preparing, compounding, dispensing and vending drugs and medicinable compounds wholesale and retail. These are the words which I submit your Lordship will put your own interpretation upon, as words running far short of the extent of the plea which is founded upon the exception, when it carries the case of the defendant further by saying he supplies medicine of his own selection in his own shop for cures.

Mr. Justice Field: You say he does what is alleged in paragraph 5, which is more than he is allowed to do.

Mr. Morgan Howard: That is extra the exception of the statute.

Mr. McIntyre: I submit it is most relevant to the issue we set up here, and that we are within the exception of the 28th section. The witness says he is acquainted with the counter dispensing practice before 1815, and I asked what that was. I say it brings it completely within the words of the section not "to prejudice or in any way to affect the trade or business of a chemist and druggist."

Mr. Justice Field: There is an issue upon that. It may be when I come to give judgment in the case I may entertain your view or Mr. Morgan Howard's view, but in the present state of the case I will take the evidence as there is an issue upon it.

Mr. Morgan Howard: Your Lordship will deal with it as we might have done. I thought your Lordship would say there was an issue upon it.

Mr. McIntyre: If your Lordship thinks we are tied down by that 5th paragraph perhaps your Lordship would give us leave to amend it.

Mr. Justice Field: In substance.

Mr. Higgins to witness: Will you tell us what the custom as to counter dispensing was before 1815?

The Witness: I dispensed medicines when they were asked for.

Mr. Justice Field: Do not use the word "dispense," because that is a word of art; tell us what you did, what was the practice.

The Witness: I must call it dispensing. We were in the habit of dispensing medicines which we recommended to persons.

Mr. Justice Field: Before 1815 you were in the habit of dispensing?—Yes, we recommended medicines to persons who asked us for advice.

Mr. Higgins: Will you explain exactly what you would do if a customer came into your shop?

Mr. Justice Field: You cannot have it more accurately than Mr. Cupiss has already given it. I suppose that was the practice before 1815.

Mr. Morgan Howard: It is very possible.

Mr. Higgins: There are certain words there that may have some meaning attached to them. If I ask him what he saw done in the shop before 1815, that may be more satisfactory.

Mr. Morgan Howard: You hear what the witness said, and I see now what the legislation was directed to.

Mr. Higgins: Suppose a customer came into your shop complaining——

Mr. Justice Field: Let us hear what was done.

Mr. Higgins: When a customer came into your shop and complained of some complaint what did you do?—I put some simple questions to him to ascertain what was the matter.

What would you do then?—Prescribe for him.

Mr. Justice Field: Would you examine his tongue?—If necessary.

And feel his pulse?—Yes.

What did you do then?—I then made up some medicine according to the best of my judgment and skill.

Should you give any directions as to the mode of taking the medicine?—Oh yes! I should not give it without.

In so supplying a customer with medicine should you give him the medicine which you had made up in your shop, or would you compound it for him?—I should compound it for him.

Should you charge him for the medicine only, or for the medicine and the advice?—Only for the medicine.

Mr. McIntyre: I submit that any one might prescribe or give to another any medicine. If they did it unskilfully they might be liable to be indicted.

Mr. Justice Field: Did the people pay for it?—Yes.

Mr. Higgins: What did they pay you for?

Mr. Justice Field: You are putting the inference to him. What passed when they paid you; did you say anything to them?—I may as well say at once that we never charged for professional advice.

What did you say to the person?—I simply told him the price.

You told him the price of the mixture or ointment, as the case might be?—Yes.

Mr. Higgins: Should you make any difference in the price whether you were making up the prescription of a physician or making up medicine of your own selection?—No.

Mr. Higgins: I propose, my Lord, to ask this further question. Has that practice continued from that time, 1814, down to 1874, when you left the business?

Mr. Howard: I object to that question.

Mr. Justice Field: When did you give up business?—December 31, 1874.

Mr. Howard: I object to the question on the ground that I have already submitted that they cannot give any evidence of acts done except before the passing of this Act.

Mr. Justice Field: You may ask any question in cross-examination to alter this, but subject to that I think the question should be put. I want to avoid if possible the danger of a new trial.

Mr. Howard: The custom alleged in the plea is founded precisely upon the statute.

Mr. Justice Field: Suppose the question were that it existed in the time of Richard II. How do you prove that? Then you say we call an old man, who says, "Ever since I was such and such an age this thing has existed."

Mr. Howard: It is evidence of reputation, but this is evidence which should be limited by the statute.

Mr. Justice Field: No.

Mr. Howard: As near as it may be. The practice depends upon this. Did the custom prevail before the Act.

Mr. Justice Field: I think I will admit it, but only in that sense, not as making it lawful, but as evidence to show what the custom was before.

To the Witness: You say the practice has existed down to 1874, and has been practised not only by you but by other chemists?—Yes; my predecessor practised it nineteen years before I took the business. When I purchased the business that was the representation made to me.

Cross-examined by Mr. Morgan Howard.

When did you begin to carry on the business of a chemist and druggist?—In 1823.

You had been an apprentice for four years? Had you ever had your attention called to the Act of Parliament, which we are now discussing, passed in the reign of George II., dated 1815?—Yes.

You were aware of the Act?—Yes

You bought your drugs from wholesale druggists?—Yes.

How did you prepare drugs?—From the formulas given in the Pharmacopœia.

If a physician's prescription came into the shop you prepared it according to that?—Yes.

The prescriptions were written in Latin in those days I believe?—Yes, and are now.

They are not always now if you will allow me to say so?—As a rule they are.

What language was the Pharmacopœia at that time written in?—Both Latin and English.

When physicians' prescriptions came to your shop, and you made up your medicines in accordance with them, you then dispensed the medicines; is not that so?—Yes.

That is dispensing, is it not?—Yes.

That is what we understand when we go into a chemist's shop and see "Prescriptions accurately dispensed." It means he makes up the prescription, puts it in a bottle, and hands it over the counter to you, and you pay for it?

Mr. Justice Field: It is described in the section.

Mr. Howard: I am only anxious to get what he did in 1815. (To the witness.) You prescribed medicine for those people who came in and asked you questions?—Yes.

Do you mean that you selected the medicines in your own mind, took down the bottles, and made them up?—Yes.

That is what you call prescribing?—Yes.

Did you use any book of reference or any medical work?—No.

Mr. Justice Field: You would make them up from your judgment and knowledge of drugs?—Yes.

You exercised your judgment accordingly?—Yes.

Mr. Howard: You had had no kind of medical education had you?—Yes I had; not in 1814. I was only an apprentice then.

You have never gone through any hospital or medical school?—Of course not.

That is what I desired to know. Except through the business which you carried on, first as an apprentice, and then as a chemist, you had no medical training?—Not up to the time I was an apprentice. I am speaking of what my master did.

You referred, perhaps, to Buchanan's practice of medicine?—No, I did not; I discarded that.

I may take it you never went out of your shop to practise?—I did not, and that is the boundary of the Act. I never visited patients, nor did my master.

Mr. Justice Field: That was your idea as to the distinction drawn by the Act?—Yes, my Lord.

Mr. Howard: Your idea is that you may examine patients, pronounce upon the case, and supply them with medicines to cure them so long as you do it within the four corners of your own shop?—Yes, that is my idea. I did it under the authority of the Act.

That was your view of the Act of Parliament in 1815?—I so understand it now.

Did you think that in 1815?—I did not act at all at that time. It was my master.

Whenever you began to act did you act under the impression that the law justified you to do so by this Act of Parliament?—Yes, because we were to do what we had done before the passing of the Act. That is our licence.

Mr. Justice Field: That is the point to be decided now.

Mr. Howard:—I suppose if I had had the good fortune to have lived in 1815 and to have had the headache, and I had come into your shop, you would have made me up a mixture for it?—I should.

Mr. McIntyre: And if he had cured you no doubt you would have been very much obliged to him.

Re-examined by Mr. McIntyre.

Was your master an apothecary or a chemist and druggist?—Nothing but a chemist and druggist.

Mr. Morgan Howard: There is another question which I should have put. I do not gather from you that in this practice, which you carried on in your own shop, you treated all sorts of complaints, of whatever character or kind they might be?—No, those we selected. If it was a dangerous case we should have nothing to do with it.

Mr. Justice Field: You would not touch what you considered a dangerous case?—No.

Mr. Morgan Howard: If a person had an attack of scarlet fever you would send that person to the doctor?—Certainly.

Take the case of acute inflammation of the lungs, would that be a case you would send to the doctor?—I have treated such a case, and successfully.

Was that the rule which you adopted?—

Mr. Justice Field: Should you think that was a case for you to treat?—I should not think so as a rule.

Mr. McIntyre: Take the earliest stages of acute bronchitis—wheezing and cold—would you have prescribed for them?—Yes.

Mr. Justice Field: Is that a stage of bronchitis?

Mr. Morgan Howard: My friend cannot give evidence.

Mr. McIntyre: The question is put to me by his lordship, and I suppose I may answer it. I should think it was.

Did you hear the evidence given yesterday?—Yes.

In 1814 you did not yourself do business?—No.

But in 1823 you did?—Yes.

Mr. Justice Field: He means to represent that as the practice of his master?

Mr. McIntyre: I think that is it.

Mr. Thomas Parsons sworn.

Mr. Justice Field: Is it worth while to carry this any further?

Mr. McIntyre: That depends upon my friend. I have several witnesses who will prove the same fact, and in order to bring it down to the present time I have Mr. Pedler.

Mr. Justice Field: I suppose they will all say the same thing?

Mr. McIntyre: Yes.

Mr. Justice Field: The last witness brings it down to 1874.

Mr. Morgan Howard: I suppose it will be the same in every case?

Mr. McIntyre: Yes.

Mr. Justice Field: How far does this witness carry it back?

Mr. McIntyre: I think to 1812.

Mr. Morgan Howard: If the evidence to be adduced hereafter is the same, I do not know that we need have it.

Mr. Higgins: I will ask him generally.

Do you live at Swithland in Leicestershire?—Yes.

Are you 85 years of age?—Yes, next August.

Were you apprenticed to Messrs. Blews?

Mr. Justice Field: Is it worth while going into that? How far can you carry your memory and knowledge as to the mode of carrying on a chemist's business—up to what year?—Soon after I was apprenticed.

When was that?—1809; for seven years in Worcester.

Mr. Higgins: Did your hear the evidence of the last witness as to the practice of counter prescribing?—Yes.

Do you agree with that?—Yes.

Was that carried on from the first time you recollect the business of a chemist and druggist?—Yes.

Mr. Morgan Howard: I will not trouble you further.

Mr. McIntyre: Then I will not call any other witness.

Mr. Morgan Howard: I submit there is no case made by the defendant.

Mr. Justice Field: You say there is no case for the defence—on what grounds?

Mr. Morgan Howard: The plaintiff's case being admitted, I submit there is no defence. The plea is pleaded, that if he did advise and supply medicines he did so by preparing, compounding and supplying medicines of his own selection in his own shop for the cure of simple complaints in accordance with the use and custom aforesaid and not otherwise. Before the passing of the Act he explains it by this: that it was usual and customary to carry that trade on by preparing medicines of their own selections for the cure of simple complaints. First of all I say there is no defence of having dealt with any complaints which the plaintiffs have proved to have been treated in this case. Then, my Lord, I say that the only defence which could be open to the defendant here would be under the 28th section, and that that limits it to buying——

Mr. Justice Field: I understand what you have already submitted.

Mr. Morgan Howard: Then I need not repeat that proposition. It is a very important one. The evidence of the witness who was examined shows very much my view of that section; but, however, that is a matter for argument. His evidence showed that dispensing was really making up physicians' prescriptions. I do not think it necessary to elaborate this further, but that is the principle. Unless the exception is proved, the plaintiffs' case is admitted. The defendant's case is the exception.

Mr. McIntyre: My friend must not assume that I am admitting the facts proved by the plaintiffs' witnesses. As to the last point of my learned friend's, that there was no evidence that complaints had been treated, such as in this case, that is hardly the way to put it, because we have given our evidence generally that when persons came in, the chemist asked what was the matter with them, and exercised his own judgment as to what it was necessary to prescribe. If my friend had indicated by his cross-examination that they had not dealt with these complaints we could have called witnesses to prove that. But I put it treating generally.

Mr. Justice Field: Do you wish to call other witnesses?

Mr. McIntyre: Certainly.

Mr. Justice Field: Then, I think, you are entitled to do so on that point.

Mr. George Godden sworn. Examined by Mr. McIntyre.

How old are you?—82.

Were you apprenticed to a chemist?—I was, in 1812.

For how long?—Five years.

To a chemist and druggist?—Yes.

Mr. Phillipson of Chichester?—Yes.

Before 1815, when you first went there, who used to see the customers and dispense to them?—My master.

Have you heard the evidence which was given by the first witness, Mr. Cupiss?—I have.

You have heard what they have said about counter dispensing?—I have.

Is that evidence correct?—I think so.

Mr. Justice Field: You mean dispensing with a counter between you and your patient; that is what you call counter dispensing?

Mr. McIntyre: You heard him say that the chemist asked the persons who came in the nature of their complaint, that he then made up medicine, and gave it to them?—I did.

Is that correct?—Perfectly correct.

Was that limited to any particular complaint?—Simple complaints.

What do you call simple complaints?—Cough, colds, local diseases, gonorrhœa.

Mr. Justice Field: Eruptions of the skin?—Yes.

Mr. McIntyre: You treated for local complaints?—Yes.

I will take the first case.

Mr. Justice Field: You must not ask him what he would do.

Mr. McIntyre: I will ask what was done.

Mr. Justice Field: He has given you his definition of local diseases.

Mr. McIntyre: Were those the only things for which you gave remedies?—For sore throats and for all simple complaints.

In the earlier stages of complaints.

Mr. Morgan Howard: Simple complaints.

Mr. McIntyre: Complaints that turn out afterwards not to be simple complaints?

Mr. Morgan Howard: I object to that.

Mr. Justice Field: I do not think we can have that.

Mr. McIntyre: Were such complaints as those mentioned treated by his employer before his time?

Mr. Justice Field: What complaints?

Mr. McIntyre: Wheezing.

Mr. Justice Field: If a man came to you wheezing you would give him something?—Yes.

If he came in an advanced state of bronchitis you would not give him anything?—No.

Suppose a man came to you wheezing and you thought it was bronchitis would you give him anything?—I have cured myself of it.

Mr. McIntyre: He calls that a simple complaint.

Mr. Justice Field: Your allegation is "simple complaints."

Mr. McIntyre: I should ask his Lordship to allow me to amend that. The fourth paragraph in the statement of defence is I submit very general. Will not your Lordship allow me to amend by striking out these words?

Mr. Justice Field: I should be doing you harm if I did.

Mr. McIntyre: Then teething and convulsions?

Mr. Justice Field: We do not want to take a case of that kind.

Mr. McIntyre: But that meets the objections of my friend.

In the case of a child being brought to you ——

Mr. Justice Field: Did he do it? Have you treated a child for convulsions?—No.

Mr. McIntyre: Nor did the defendant.

Mr. Justice Field: You put it to him and he says no.

Mr. McIntyre: I should ask him what he means by his expression "simple complaints."

Mr. Morgan Howard: He has already given you some illustrations.

Mr. McIntyre: Amongst others he has named bronchitis.

Mr. Justice Field: What do you mean by "simple complaint?"—Coughs, colds, cutaneous diseases, and other simple complaints.

Mr. Howard: Such as a boil or a cut finger?—Yes.

Mr. Morgan Howard: You may go; I will trouble you no more.

Mr. McIntyre: I will now call Mr. Pedler. (After a pause.) My Lord, I find that this witness will not go back to 1815, but only to 1830, therefore it is no use my calling him.

Mr. Justice Field: No.

Mr. McIntyre: Then that is my case.

Mr. Justice Field: I understand you are going to the jury upon the question that he did not act as an apothecary within the meaning of the Act. Do you propose to go to the jury upon that?

Mr. McIntyre: Yes. The form should be "advising and dispensing medicines." Their charge is "attending."

Mr. Justice Field: Do you propose to go to the jury upon that?

Mr. McIntyre: "Attending and advising."

Mr. Justice Field: You say he did not attend.

Mr. McIntyre: Not within the meaning of this Act.

Mr. Justice Field: I will ask the jury that question whether he acted as an apothecary by attending, advising, and supplying.

Mr. McIntyre: The only other question is whether what was done by this gentleman was the same as was done before the year 1815.

Mr. Justice Field: It is, first, did the defendant act as an apothecary; and, secondly, whether before the passing of that Act it was customary for chemists to compound and prescribe medicines in their own shops for the cure of simple complaints. You do not say the cure of such complaints as stated in your statement of defence. You may take it, if you like, in that shape; was he in practice for such complaints as appear in the statement of defence?

Mr. McIntyre: That is under that plea. First, there is a denial of acting and practising as an apothecary by attending, advising, and supplying. Another question will be whether the trade or business of a chemist and druggist was exercised and carried on before 1815 in the way it was exercised and carried on by the defendant.

Mr. Justice Field: I shall not put that; I do not think there is any dispute about that.

Mr. McIntyre: The third question would be whether what the defendant did was within that custom.

Mr. Justice Field: Did the defendant dispense, compound, and vend drugs in the same way as before the Act.

Mr. Morgan Howard: That is almost a question for your Lordship.

Mr. Justice Field: That is my impression.

Mr. Morgan Howard: I submit that it is.

Mr. Justice Field: I think it is.

Mr. McIntyre: The first question I should ask the jury to find is the fact that this gentlemen did not attend, advise, and dispense medicines as an apothecary.

Mr. Justice Field: Attend, supply, or advise; did he advise or supply as an apothecary? That is the question I should ask the jury.

Mr. McIntyre: He would be entitled to supply medicines.

Mr. Justice Field: As an apothecary?

Mr. McIntyre: It will be for your Lordship to tell the jury what that means.

Mr. Justice Field: What other question is there?

Mr. McIntyre: The other question your Lordship says is proved, that before 1815 chemists and druggists did in simple complaints dispense in fact.

Mr. Justice Field: There is no question about that to go to the jury.

Mr. McIntyre: Your Lordship rules that paragraph 5 in the statement of defence is proved.

Mr. Justice Field: I cannot say that.

Mr. McIntyre: I understood your Lordship to say it was. The second question is, whether what the defendant did was in accordance with that custom.

Mr. Justice Field: Were the children suffering under simple complaints—that is what you mean?

Mr. McIntyre: There is no evidence of that at the time he prescribed. Your Lordship limits it to "simple complaints."

Mr. Justice Field: You have so put it in your statement of defence. Were the complaints under which the children in question were suffering complaints of such a character as it was customary for chemists and druggists to prescribe for before the passing of the Act. I will ask the jury that question. We had better keep them to the simple complaints.

Mr. McIntyre: Gentlemen of the jury, the first question you will have to decide is, did the defendant act as an apothecary by attending, advising, and supplying patients with medicines? That is a question of fact which you will have to determine. You have the facts before you. In two cases a person came to his shop with a child, and in the other two cases, where the children were not present, the person who came described to the defendant what the children were suffering from. He, upon the description given to him, gave medicine to the people who were in his shop. He charged for that medicine, and they took it away. In the first case Mrs. Culverwell said he gave her that medicine, telling her that it would do the child good, but that if the child was worse she was to send for a medical man. In one case the child had what was thought to be a sore throat; and you have heard the evidence of the old gentleman this morning who showed what the practice was—that for sore throats and things of that sort they would be treated; the defendant gave medicine for the purpose of curing the child. In the third case the child was brought to him; he saw the child and gave it medicine. And in the case of Rhodes, where the child died of scarlet fever, he never saw the child at all, but he treated it by giving medicine according to the symptoms which had been described to him by the grandmother of the child. Although that child died of scarlet fever, the medicine was given to her on the Monday, and the child did not die until the Tuesday week following. The evidence of the doctor is, that the child might have been suffering for four or five days. But you all know that these diseases go on more rapidly at one time than at another time. The medical gentleman having had the symptoms described to him, treated the child. Is that attending, advising, and supplying medicine as an apothecary? I submit to you it is not attending and giving medicine, when a person comes into your shop and gives an account of what appears to be a simple complaint; he prescribes over his counter, and gives the medicine which he thinks will do for a simple complaint. The first witness, Mrs. Culverwell, said that her child had a slight wheezing, and the defendant told her that as long as that continued there was no danger, but if the child got any worse she was at once to call in a medical man. The next case was that of Fanny Grist. She saw Mr. Wiggins, and he told her the child was bad, and he told her to call in a medical man. It is true he gave some medicine to ease the child until the medical man could be called in. I put that point most strongly before you, that that is not acting as an apothecary by attending, advising, and supplying medicine. He was only doing that which would ease the child, and do the child good for the time, and the only advice which he gave was to call in a regular practitioner. That was on the Sunday night, and the child died upon the Monday. Then Rosina Bennett is the case which my friend relies upon, because the child was suffering from bronchitis. We have evidence of the last witness examined to-day, who said he himself would have treated bronchitis; that he treated that as a simple complaint, and certainly in the early stages it is a complaint which might very well be treated by a person acting as a chemist in the way they had acted before 1815. In this case the grandmother went to Mr. Wiggins's shop on the Monday, and told him the child was ill. He asked what it was suffering from, and she said the child was suffering from a violent cold. The defendant never saw the child at all. He acted upon the description the woman gave, and he gave the medicine to her; he never saw her again. It was the mother who came afterwards, and asked him what the child was suffering from, and she stated in the box that he told her the child was suffering from scarlet fever. There must be some mistake about that, which, no doubt, arises in this way: that the child having died from scarlet fever the mother knew all about it; from the time they called in Dr. Cooper they knew what was the matter with it, and therefore she thought the defendant told her the nature of the complaint. But the description which the chemist had to go upon was the description given by the grandmother, and the only medicine given to her was for a violent cold which she said the child had. That proves he was acting as a chemist, and not as an apothecary attending, advising and supplying medicine. The other question is, whether these ailments were such as were attended to before the year 1815. In the two cases where he saw the children, I submit, it is clear the state the children were in then were ailments such as would have been treated by chemists before 1815, and that they did dispense medicines for the curing of these very things. With respect to the cases where he did not see the children, the descriptions were given by the persons who came to him; he acted upon the descriptions given, and they were descriptions of simple complaints, such as were treated before the year 1815. I say in neither case ought your answer to be against the defendant, but for him.

Mr. Morgan Howard: May it please your Lordship, gentlemen of the jury, this case has lasted a long time, but I do not think it has lasted a moment too long when you consider what the important issue you have to determine is, and the important interests to the community at large. I also venture to submit to you that the time has arrived in the state of society in which we live when the relations which exist between the branches of the medical profession should be ascertained at once, in order to do away with the evils at which the legislature aimed some years ago, but which legislation has not been as effectual as it was contemplated it would be. The Act has been in force now for over sixty years, and the Apothecaries' Company, who are the guardians of this statute, which was passed not for their benefit, but for the benefit of the public at large, have watched the proceedings of unlicensed practitioners with a view to suppress that practice, and to protect society from their incompetency. No care has been wanting on the part of the legislature in surrounding chemists and druggists with every privilege that they can desire to have. They carry on a lucrative and important business, the profits of which are notoriously large; they are not hampered or fettered in any possible respect, and it is only when they overstep the limits which good sense suggests they should not overstep that proceedings are taken. We find that as long ago as 1815 great mischief had arisen from the incompetency of certain chemists. It is admitted that they do not undergo any examination sufficient to enable them to take the diagnosis of various complaints. I am sure you will think that the Apothecaries' Company are only doing their duty, which they are bound to discharge for the protection of society, in bringing this matter before you for your determination to-day. When issue, as we say, was joined in this case, what was in substance the question you had to try? It was whether or not the defendant had been acting as an apothecary. His Lordship will tell you that it is not in the smallest degree necessary that you should attach any importance to the word "attending." The question will be whether or not he did advise with the patients, and having advised, in the sense of diagnosing their complaint, he did make up a mixture for them. If you find that, his Lordship will direct you that is acting as an apothecary, not merely in the light of the statute, which has not been construed, but by the light of the decisions which have been given upon the statute. I have called my Lordship's attention to one or two cases which have expounded the statute where the judges laid down, what one would have expected, that where a man does commune, so to speak, with a patient, by saying, "What is the matter with you? Let me look at your tongue," or "feel your pulse," and supplies medicine to that person, and gets money for it, he would be acting as an apothecary within the meaning of the statute, and doing the very things which that statute was meant to obviate when it was passed in the year 1815. Gentlemen, this statement of defence was framed by an exceedingly able friend of mine who sits not very far from me, and he having been advised from the outset of the case, gave an interpretation to the conduct and acts of his client which was best suited to draw, if possible, from you a verdict in favour of the defendant. They have not had the courage to suggest to you to-day that the treating of serious diseases, such as scarlet fever, could be supposed for one moment as coming within the proper province or exception of this statute. It is "simple complaints," such as that very cheerful old gentleman whom I congratulated upon having reached the very mature age of 84, described, such as a cut finger, or a boil, any of those simple ailments which we ourselves commonly treat at home. If you have a wheezing, you put a mustard plaster on your chest with the assistance of your wife, or nurse, as the case may be. Such things are done without the suggestion of a chemist. But they did not invite your consideration upon this, whether the attendance of chemists in a case of pneumonia or bronchitis, which, when it reaches that stage has nothing to do with a mere cold, scarlet fever, which, according to our witnesses, and it is perfectly uncontradicted, was treated by the defendant after he had examined the patient, and after he had pronounced that it was a case of scarlet fever, was lawful.

Mr. McIntyre: He never saw the scarlet fever patient.

Mr. Morgan Howard: If you would only wait a moment you would hear what I was going to say. Gentlemen, this was the case of Rhodes. There were two cases of not seeing the children, and two cases of seeing them. I may as well make the observation at the outset that if it were possible to distinguish between the objectionable character of uneducated men, that is to say, uneducated in a medical sense, dealing with complaints of this character, you have it manifested in this instance where not only does he deal with a case of scarlet fever but deals with it in the absence of the patient. Can anything be more conducive to injury to the body politic? Here the grandmother comes for the medicine, which is given to her over the counter, for a child suffering from one of the most malignant, and very often fatal, diseases, scarlet fever. The child is treated by a chemist in his own shop in the absence of the child, and it is only when the case becomes alarming and he perhaps has the possibility of the law before his eyes, that he remits the case to the person to whom it ought to have been sent in the first instance, namely, a doctor, whose business it is to deal with such cases. I pray you, as representing here, not only the Apothecaries' Company, but as representing yourselves, for you form a portion of the community, to put a stop to this, and to do this by your verdict, to pronounce this is a thing not to be tolerated, having regard to the condition of society and to the acts of unlicensed practitioners, and to give the legislature, if necessary, the opportunity which they now are about to do, of reconsidering the Act of Parliament, and to legislate for the future; but to let it go forth that chemists are to treat persons suffering from a malignant disease, as was the case with this poor child, would be to give a premium to this kind of thing which would be availed of right and left throughout this metropolis and in all the large towns. Take the case of bronchitis. That is an extremely serious disease. My friend did not venture to suggest in cross-examination, when Dr. Cooper was here yesterday, that bronchitis was not a disease of a serious character. It is notorious that it is; it brings about other diseases, and very frequently indeed in some form or other it introduces complications into the system which ought to have a careful watching at the outset. And yet here is a case which Mr. Wiggins undertakes to treat, and does treat, by giving a bottle of medicine. It is not a case of a person going into a shop as you may do, and say "I do not feel very well. I want a dose of Gregory's powder." We all know what that means; there you specify the medicine, and the chemist runs no risk. If you are out of sorts you perhaps ask for a patent medicine, which the chemist is absolutely entitled to vend, and gets the profit upon so doing. If you ask for so many grains of this, and that, to be put up into a pill, you are the author of your own wrong if any occurs, and not the chemist. The mischief aimed at by the Act is this, that a person suffering from ailments, and not knowing how to treat them, goes into a shop, and the chemist subjects him to an examination, looks at his tongue, feels his pulse, and goes through other formalities, pronounces it a disease, and then says, "I can cure this," and thereupon makes up a bottle of medicine with all the solemnity with which he would make up a physician's prescription, and the result often is that people are made worse rather than better—though I do not say it was so in this case. I put it to you, after evidence of this kind, whether it is possible even to bring any case within the purview of a statute like this. Where cases are difficult to treat by the well ascertained rules of medicine, or by referring to the Pharmacopœia, it is monstrous to assume that chemists who have no means of undertaking them, who are never educated for it, and who undergo no examination for it, should be permitted to vend over their counter, merely for the sake of pushing an additional trade, so to speak, instead of being content with the abundant trade at their disposal, and their remunerative profits. The apothecary is a certified practitioner. Ever since the apothecary's rank in the profession has been ascertained he has had to undergo a series of examinations, which are as strict as it is possible to conceive, at the Apothecaries' Hall. He has to undergo an examination in the Pharmacopœia, in anatomy and various other branches of medical knowledge in order to acquire skill, without which he is not permitted to receive the certificate which it is necessary for him to have before he can practise, in order not to incur penalties under the Act of Parliament. But when such things are done as we have heard stated here it is time for the Apothecaries' Society to step in. If the legislature had pronounced these unlicensed and unqualified acts to be a misdemeanour punishable by fine and imprisonment, we should have had our friend Mr. McIntyre here today saying, "Do not send this man to prison, it is a monstrous thing." But instead of its being made a misdemeanour, the legislature, said when the thing is proved to the satisfaction of a jury there shall be a merciful way of dealing with it, namely, by suppressing the practice, and inflicting a moderate fine. Chemists and druggists will not find it convenient to continue the practice any longer, if they are liable to a fine for so doing. I invite you to say upon the first point that beyond all doubt Mr. Wiggins was acting in these cases as an apothecary. You will have my Lord's direction upon the law of the case, and therefore, it is not necessary for me to deal with that. It is said the cases treated by the defendant were simple cases; but you have heard that one was a case of scarlet fever, and that being so, anything more unlike the complaints spoken to by the defendant's witnesses, such as a bit of a cold, a cough, a cut finger, or boil, cannot be imagined. I say scarlet fever and bronchitis are not simple complaints at all, and that the only defence upon this record has failed. I may remind you, as I think I told you before, that people are in no difficulty whatever about going to chemists and druggists. They may go in and get their medicines just as they please, and the chemist has nothing to do but to dispense. He may sell patent medicines under the due protection of the law, but the only thing he may not do is that which every one will say he ought not, namely, to pronounce without medical examination upon difficult cases, and administer medicines under certain conditions up to a given point, and then when his skill fails him he shelters himself from risk by sending the person to a medical man, who ought from the first to have had charge of the case. If you want an illustration of this sort of thing have you not got it in the cases before you? Is it altogether unreasonable to suppose that some possible escape might have happened to one of these children if the mothers had been bound to take the children in the first instance to a medical man? If that had been done there might have been some hope that at least two of those children might have escaped and have been living at the present time. But they all died. Allow me to say here that I desire to shelter Mr. Wiggins from all responsibility in this matter. I do not say that they would have lived if they had been taken to a medical man; but still I put it to you that where it is desirable that persons should not entrust their lives to unskilful hands it is better to take the case in time to properly qualified persons, and not to run any risk. You will have two questions left to you: one is whether there was an acting or practising as an apothecary, and the other is, were the children suffering from infant complaints such as it is customary for chemists to prescribe for. I have already discussed more or less both propositions, and, therefore, I will not weary you by going over the ground again. It is impossible to say that these children were suffering from such simple complaints as we have heard described, because one of them had scarlet fever. You cannot say that scarlet fever, acute bronchitis, or advanced inflammation of the lungs are simple complaints, which you could go into a chemist's shop and ask for a pill or powder to cure. In so far as this issue is before you for decision there is no answer, as I submit to you, to the case which the plaintiffs make out, that the defendant acted and practised as an apothecary within the meaning of the Act. He has failed to show these were simple complaints which he was justified in treating, or that they were such complaints as were treated by chemists before the year 1815. There is nothing more to which I have to call your attention. I may add that the case has been considerably shortened by not calling witnesses one after another to go through the same details. Nothing has been withheld from you;

the defendant has not disputed the plaintiffs' case, and the question appears substantially this, whether these are simple complaints within the meaning of the plea as set up by the defendant. Unless that plea succeeds there is no answer to the case of the plaintiffs, because if the complaints were not simple complaints he was acting and practising as an apothecary within the meaning of the statutes, and was doing those things which were pernicious sixty years ago, and are now more pernicious still, for this reason, that the knowledge of medicine has been considerably extended of late years, and there are institutions established for the supply of medicine to all ranks of people, even to poor people who cannot afford to pay for it. Therefore, it is no excuse for chemists, who are extremely well treated by the legislature of this country, to invade the proper domain of the apothecary for a gain which, I submit, they ought not to receive.

Mr. Justice Field: Gentlemen of the jury, this matter although it is very properly described as a matter of importance is yet really a very simple matter. when you come to look into the real facts of the case, although no doubt a matter involving certain questions of importance one way and the other. But a great many questions that you have not unnaturally had drawn to your attention by the learned counsel on both sides, seem to me to be beside the question. In the first place you know Mr. Wiggins is not to blame for what has been done in any way; that is, there is no moral blame attaching to him for what he has done. No doubt he has done that which he for many years, and a great many other respectable people have been in the habit of doing, but you have still to consider whether that is within the Act of Parliament, or not. Then the poor children died. You must not take that at all into your minds as any blame to him at all, because the percentage of deaths of children is very high indeed, and it is not at all suggested that what he did was in any way bad practice. At the same time it is important as a fact in the case, to show that the diseases under which the children were suffering at that time were of such a character that they did very shortly end in death. That shows what the character of the complaint was under which the children were at that time suffering.

Then you have heard, of course, naturally enough, first of all about the advantages of the Act, and next you have heard the disadvantage, or suggested disadvantage, that poor people should be restricted in their right to go and pay a chemist or druggist 6*d*. or 7*d*., when if they had to go to a regular apothecary they would have to pay something more. Therefore it is said that that is an evil, and you are rather invited to come to the conclusion that this is a hardship upon these people. But there again we must not go into that; we should be making the law, instead of deciding it. What you and I have to do is simply to decide according to law. If the statute of 1815 is wrong, let the legislature by all means alter it, and I have always thought that the best way in which the legislature can be satisfied of the propriety of altering the law is by deciding according to the law. If we are to decide that this is not within the law, the legislature would not want to alter it, if they thought it wrong, and therefore the better way always is for courts to decide according to law, and leave the legislature to say when they see what the effect of the law is upon contracts or upon society, or upon the interests of the community whose interests they are called upon to represent: if they find that in effect it is a bad thing and they wish to alter it, they will alter it within such degrees and limits as they think right. What I wish to impress upon you particularly is this: please to dismiss all these topics from your mind. I will tell you presently what the statute means; I will tell you very shortly what acting as an apothecary means; and then I shall tell you what the evidence is, and you will say whether there is any doubt upon the evidence as to the defendant having so acted.

Now you know this is not the only exclusive legislation. It extends in this country, as in most other countries, to a great many professions and trades. That is, the Government of the country—whatever it may be—the State, thinks it is, and probably it is, at all events it thinks it is its duty to interfere, first of all to some extent with freedom of contract. You may go and pick out any shipbuilder you like all over the world; you may take the most ignorant man—a man who started a shipyard yesterday if you like, and nobody will interfere with you, or with him either. You may buy whatever goods you please of anybody who has only started in business yesterday and has no qualifications at all. All that the legislature leaves to freedom of contract, which is the foundation, no doubt, of all good systems of legislation; that is, to leave people as much as you can to judge for themselves who are the people they like to employ, and to consult, and let them take the consequences if they make a bad choice. But there are certain cases in which the legislature makes an exception. It is not confined to England. France and other countries have the same, and the principle upon which the legislature acts is this, "We think we ought to supply our citizens with the means of consulting certain persons of skill in the respective mysteries or faculties that they exercise." For instance a solicitor must undergo five years' articles before he can lawfully practise as a solicitor, and if he does it without that he incurs a penalty. I can very easily understand people saying, "Oh! but what a pity that is; because I could go to such a man and I could get advice. He would give me advice for 3*s*. 4*d*. which I should be quite as well satisfied with as if I went to a first-rate firm of solicitors." But the legislature says, "No; we think in consideration of that we will prohibit any other person doing it, because we think we are bound to provide our citizens with skilful people in certain particular arts and professions; that is we will take care that there shall be such people whom they can consult, and we will prevent anybody but those people giving advice in such matters. The medical profession is familiar to you; we all know it. The legislature says an ignorant person or a poor person has no means of knowing whether Mr. Smith or Mr. Johnson is a good man or not; therefore they must have a person who has undergone a certain examination. That is the state of the law at the present, here in this country, and the question is what falls within the law. Now before the passing of this Act—and we are dealing with an Act of some age, as far back as 1815, before the passing of this Act, it is quite obvious from the language of the Act itself that the medical profession was divided into four different branches. There was the physician then, as there is now. The physician prescribes for you. Originally no physician ever did anything more, because originally the College of Physicians, established I believe in the time of Henry VIII.—I am not quite sure,—but that college would not grant a licence to anybody as a physician unless he came under the condition that he would not dispense his own medicines. That state of things continued from that time down to 1838; and in that year the College of Physicians did pass a bye-law enabling their licentiates to administer and supply their own medicines; and the consequence of that is, it seems to me, very beneficial, for there are a great many gentlemen who are physicians, who have taken their degree and rank as physicians, who yet practise generally and give their patients the benefit of their experience and of their qualifications as physicians, and at the same time they give them the medicine which they are entitled under those circumstances to dispense. That is what the physician does. He does not supply anybody else with medicine, and he has a right himself to give you a prescription which you may take to your chemist and druggist to be made up, or he may supply it himself and you may take the medicine from him, or he will send it to you if you send to him for it.

Then, besides the physician there was the surgeon; originally he was the barber—the barber-surgeon. The difference between the surgeon and the physician was this: that the physician dealt with the ailments of the body, constitutional or functional derangements, gout, typhus fever, scarlet fever, or anything of that kind. The surgeon, properly, was limited to external operations or ailments, and also such internal operations or ailments as come within the science of surgery. For instance, if you break your leg the surgeon sets it for you; if you have a tumour inside your body, and you think it can be cut out safely, the surgeon will come and excise it for you. And the surgeon, as a rule—the surgeon *per se*, by himself, not at all operating in the way of surgery—if he were to give you advice and medicine, would be infringing this Act, because he would be acting in that case as an apothecary. As a surgeon he may do that which is ancillary; for instance, he may give you an anæsthetic, or give you something which he thinks will operate favourably upon you at the time. When you have a purpose ancillary to a surgical operation, then the larger thing, the surgery, covers the smaller thing, and no doubt in that particular case his giving a medicine is not an improper act, and he is not liable to a penalty for it, because it is the smaller thing, attendant upon and consequent upon his duty as a surgeon.

Then comes the third degree—the apothecary. There is no doubt that originally the apothecary was what afterwards became, to some extent, the druggist. That is, he culled his simples himself in the fields, dried them in his *apotheke*, or place where he deposited them, and from there administered them. That, no doubt, was originally the apothecary. But there is no doubt also—as the evidence we have had shows us—that before the statute of 1815 the apothecary had become not merely a seller, but had acquired, not any technical right, but as a fact the habit of attending people, advising them, and giving them medicines. What you call the general practitioner of today is an apothecary as created by this Act of Parliament. He is called a general practitioner because he is not merely either a physician or a surgeon, but also an apothecary under this Act.

Then comes the fourth, which is what is now called a chemist and druggist. He was in existence also, and carried on trade or business as far back as 1815, and you will see by this Act what his duties were, and what it was he did. That being so, the question for you is, whether or not—I will not say in attending, because that is a question which is in dispute, but in doing what he did in respect of these three children, Culverwell, Bennett, and Rhodes, the defendant acted and practised as an apothecary. The Company has laid down the way in which they say he did do it, namely, by attending, advising, and supplying medicines as an apothecary. Now do not run away with the idea that it must be attending, and advising, and supplying altogether. You may read all these distributively. If he advised, and supplied medicines; or you may take it in this case if he has attended, (because after all it would be a question whether he did not attend in this case), but if he advised and supplied medicines as an apothecary; if he advised as an apothecary; or if he supplied medicines as an apothecary—taking them all, that is the language of the Act—and the thing charged is that the defendant attended, advised, and supplied medicines as an apothecary, what does the Act say upon that question? The Act points to this: it begins by reciting the charter, and it speaks of the art, mystery, or faculty of apothecaries. That is how it describes it; art, mystery, or faculty. Art, you know what that is. Mystery, you know is what is called a secret. Faculty, you know what faculty is, a learned body. Speaking therefore, first of all of the practice of an apothecary, it is described as the art, mystery, or faculty of an apothecary. In respect of chemists and druggists, it is the trade or business of a chemist or druggist. You see the difference of language which the statute uses with reference to the two things. Then the charter and the statute supply you with what the meaning of it is. First of all it recites the charter, and it says it was granted "to all and singular other persons whomsoever, brought up and skilful in the art, mystery, or faculty of apothecaries, and exercising the same art, mystery or faculty, then being freemen of the mystery of grocers, or being freemen of any other art, mystery, or faculty, so as they had been brought up and were expert in the art or mystery of apothecaries." So you see that the persons limited by the charter were persons who had undergone some species of training before. They were to be members of the grocers, or if members of any other guild or mystery, they were to be brought up and expert in that.

Then this Act, after confirming the charter, and giving certain powers to the Master and Wardens of the apothecaries, says especially this, and here is the definition to some extent, not the whole of it. Mr. McIntyre says it is the whole; but it is not. Section 5 says, "It is the duty of every person using or exercising the art and mystery of an apothecary, to prepare with exactness and to dispense such medicines as may be directed for the sick by any physician lawfully licensed to practise physic by the president and commonalty of the faculty of physic in London." Then for further protection it provides for certain things. If there is the initial of a physician he must do it, and it provides a penalty also if that is not so done. Then the Act proceeds to appoint persons as Examiners for the purpose of seeing that the requisite skill is possessed by a person before he practises as an apothecary. Therefore he is to undergo by section 9 and various other sections an examination; he is to give notice. And then the 14th says, "and to prevent any person or persons practising as an apothecary, without being properly qualified to practise as such after the first day of August, it shall not be lawful for any person or persons to practise as an apothecary unless he shall have been examined by the Court of Examiners." What does that point to? It points to the acquisition of a certain quantity of skill, information and learning. He must be examined by the Court of Examiners, or the major part of them, and he must receive a certificate of his being duly qualified to practise as such from the Court of Examiners, or the major part of them. Now what is the examination to be for. They are "hereby authorized and required to examine those persons for the purpose of ascertaining the skill and diligence of such person or persons in the science and practice of medicine, and his or their fitness, and qualification to practise as an apothecary."

Now you cannot have anything more clearly laid down than what the nature of the duty is which an apothecary is to be called upon to execute. The legislature says he must attend this complaint, or that complaint, and that before a man shall practise as an apothecary he must be such a man as shall, on undergoing an examination by the examiners, be found to possess the requisite skill to practise as an apothecary. "Every person must give notice." I need not trouble you with that. That is the language of the Act with reference to the qualifications of an apothecary by which you may infer what the duty of an apothecary is.

Now we have another section which lays down what the chemist and druggist is, what he was, what it was intended he should not be prejudiced in by this Act. The 28th section says that: "Nothing in this Act contained shall extend or be construed to extend to prejudice or in any way to affect the trade or business of a chemist and druggist"—you see the different language—"in the buying, preparing, compounding, dispensing, and vending drugs, medicines, and medicinable compounds, wholesale and retail; but all persons using or exercising the said trade or business," that is the trade or business before mentioned, in the vending these things, "or who shall or may hereafter use or exercise the same, shall and may use, exercise, and carry on the same trade or business in such manner, and as fully and amply to all intents and purposes as the same trade or business was used, exercised or carried on by chemists and druggists before the passing of this Act." The word there which Mr. McIntyre, of course very naturally, puts his case strongly upon is the word "dispense;" but now you will see whether this Act of Parliament throws any light on the meaning of the word "dispense." It is not the first time it is used; because you will find that the word is in the preamble to the 5th section, and you will see what it says about dispensing there. "Whereas it is the duty of every person using or exercising the art and mystery of an apothecary, to prepare with exactness, and to dispense such medicines as may be directed for the sick by any physician lawfully licensed to practise physic" by so and so. So that dispensing was part of their duty. They had no doubt a right to dispense also without that element, but they are also to dispense according to these directions; that is the apothecary. The chemist and druggist is described thus, although he may dispense : as buying, preparing, compounding, dispensing, and vending drugs and compounds, wholesale and retail. Dispensing in section 5, refers to the apothecary's duty. Dispensing here refers to this, but is not limited, although the word dispense has been used before, to the dispensing. He may dispense no doubt in this sense, that he may dispense medicine as he had before done. Then the question will be whether or not this was a mere case of dispensing here, or whether this was a case of advising and supplying medicine in the character of an apothecary.

Now I have before me the definition of an apothecary, as I find it laid down by those who have gone before me. "I should tell you that the duty of an apothecary is that he is a person who professes to judge of internal disease," (but internal here merely means as distinguished from surgical, it is not intended to mean one particular part of the body)—to distinguish ailments such as fevers; it would be difficult to find one word which expresses it all, but you know the meaning of that, "to judge of internal disease by its symptoms, and applies himself to cure the disease by medicines." That is the definition laid down by a very learned judge, Mr. Justice Cresswell, in a case he left to the jury as far back as 1845, and I adopt that and tell you that is the law. I take his language, adopt that language, and tell you that a person practises as an apothecary, if he does what Mr. Justice Cresswell here says : If he professes to judge of internal disease by its symptoms, and applies himself to cure that disease by medicines. I should ask you to keep that definition in your minds when I come to read you the evidence, and to see whether or not, what the defendant did here falls within that. Then I find another definition some years before, in which the learned Lord Chief Justice of the Queen's Bench of that day was of opinion that a man who kept no shop, but advised patients and made up and sold to them medicines which he himself ordered, did act as an apothecary in the ordinary sense of the term, and that it made no difference if he prescribed as well as prepared the medicines; he was still acting as an apothecary.

I give you those two decisions of two very learned judges, and I adopt them as the law which I lay down to you to-day. Therefore, what you will have to consider in the first instance is whether within those definitions the defendant did act and practise as an apothecary by attending, advising, or supplying medicine as an apothecary.

Now there are three cases in question, all of them cases of children. The first case was Mrs. Culverwell's, I think; and the case was of this kind. Mrs. Culverwell had a child called Alice, of two years old. The child had a cold, and had had a cold before. On a former occasion when the child had a cold, the child had been taken to the defendant, and it was for the same complaint, cold on the chest, so that he had known the child before. Under these circumstances just hear what Mrs. Culverwell did. She said, "I went to the shop without the child. He keeps a chemist's shop. I saw him. I said my child is poorly. He said, what do you think is the matter with her? He had known the child before. I told him that she had a wheezing on the chest; and she was very thick on the chest. He said if the wheezing continues there will be no danger. He gave me a bottle of medicine, and told me to put a mustard plaster on the chest. An assistant prepared the medicine. The defendant went out and left directions with the assistant. I saw him prepare it. I paid 7*d.*, and took the medicine away. The next night I went again. I told him I thought the child a little better. He said continue the same medicine. He then directed the assistant to prepare the medicine. Altogether I had three or four bottles of the same preparation. On the Saturday I took other advice." Now then, what was the matter with the child? She says she went to Dr. Cooper on the Saturday, and Dr. Cooper tells us that the child—No; I do not think he speaks about Culverwell.

A Juror: He said it was pneumonia, I think.

Mr. Justice Field: Now you must consider whether he was acting as an apothecary in doing that.

Mr. McIntyre: He said the child was in an advanced stage of pneumonia when he saw it.

Mr. Justice Field: You must consider whether in what he did there he acted as an apothecary. What was he doing? Of course, he was selling in one sense. He was selling medicine. He compounded it, he prepared it, and he dispensed, and vended it. He prepared, compounded, dispensed, and vended it. Did he act as an apothecary? What is an apothecary as distinguished from a chemist and druggist? A chemist and druggist you know has a prescription given to him, and he then is not advising, he is doing that as a chemist and druggist. All he does is to take the doctor's prescription, and make it up, according to what the doctor tells him.

The Foreman: In the way of trade, my Lord.

Mr. Justice Field: Of course a chemist and druggist also sells any particular medicine you may ask him for. You say, give me Powell's Balsam of Aniseed; or give me any other well known medicine. You take upon yourselves there to judge whether it is good or not for you; you do not ask any advice at all; you simply go and ask him for it. Mr. McIntyre says: Is a man to be prohibited from drawing out from one of his jars a certain quantity of matter, and putting it into a bottle with 1, 2, 3, 4, 5, and 6 upon it. That is not the question. If you go in and say, give me so much syrup of squills; give me so much of any common thing you like to have; of course the chemist and druggist is selling them, but not as an apothecary, because he is not giving you advice, or ordering anything at all. In this case you observe what happened is, he asked what the symptoms were, and having got the symptoms, he advises that if they continue, a certain thing will be good; if not, she must do something else which he ordered and gave to her to do. That is the case there.

The next case is that of Fanny Grist. She was taken to him, and therefore, unless attending is to be read as going away from your place, he attended upon the patient. There was the patient there. He saw the child. What she says is this: "I said, will you give me a little medicine for my child? He said, yes I will: what are the symptoms? I said, I gave her half a teaspoonful of castor oil in the morning; she has been looking very bad all day. I said when she was five months old she had been in convulsions; I thought by her appearance she was going to have some. He examined her and said he thought so too. He made up a bottle of medicine and gave it to me, and a powder. I do not know whether he made up the powder or not. He told me to give her the powder as soon as I got home, and an hour after to give her the draught. Then I paid 6*d.* or 9*d.* I gave a dose. After the first dose the child died. On the Sunday he said he thought the child was very ill. He asked if the child had diarrhœa. I said no. He examined her tongue and felt her pulse, and after this he prepared the medicine. On the Sunday he said he thought the child was very ill and if she was no better the next morning, I had better call in a doctor." That is the second case. The doctor tells us the child must have been suffering for several days from acute bronchitis.

Mr. McIntyre: I do not think he saw that child.

Mr. Justice Field: The third child, Bennett, "he looked at. He said she has acute bronchitis; you must take great care of her. He looked at her mouth and made up some medicine in a bottle in my presence. I do not know whether it was composed of more than one ingredient. He took it out of a bottle and told me the child must take it three times a day. I gave it in doses to the child."

What you have to say is, whether in this case he was supplying and acting and practising as an apothecary. He did the very things which in the law as I have laid it down to you, it is said must not be done. He used his skill; he did not merely do something acting on anybody else's prescription or orders. He did not give merely a specific article in answer to a request for a specific article, but was presented to the patient and made inquiries what the symptoms were, exercised his judgment, gave his advice, no doubt his honest, best advice, or gave his advice in the shape of medicine which he gave the mother of the child in this case, for the purpose of medicine.

Now having told you what acting as an apothecary is, you will have to say whether or not you think he did use the art and mystery and practice of an apothecary, and if so you will find a verdict for the plaintiffs on that question. If he did not, then of course there will be a verdict for the defendant entirely.

Then a question is raised under the 28th section, and it is said there was a custom. The allegation in the statement of defence is that for simple complaints there was a practice before 1815 to do this thing, which has no doubt been proved. It is not necessary now for me to say anything about that, but probably by and by, if it becomes necessary, I should have to say that that very practice was the thing the legislature intended to put an end to. It seems to me that was the very thing the legislature said. They said, "We do not want to interfere with the trade or business of a chemist in doing these things;" but the very object of the legislature was, that persons who had to exercise their judgment upon questions requiring judgment and skill, were persons who should undergo an examination, and should have a certificate, so that the public might know to whom they were to go, and see whether they were certified. However, the evidence proved by Mr. McIntyre went to this, that before 1815, and since that time, there has been a practice on the part of chemists and druggists, without undergoing any examination, or having any certificate from the Apothecaries' Company, in simple complaints—that is the phrase used in the defence, and used by the witnesses—to do this thing. The only question I am going to ask you upon that is, whether these three cases of Rhodes, Culverwell, and Bennett were simple complaints within the custom so proved or alleged. Now you know what they were. One was a case of advanced and acute bronchitis, another was a case of pneumonia, and the other was a case of convulsions. If you like, put aside the question of convulsions for the moment, for children are liable to them; still, considering the two cases of bronchitis and pneumonia, you know—everbody knows—what a serious thing pneumonia is, congestion of the lungs, inflammation of the lungs, and what a serious thing bronchitis is, and how often it ends in death; you must consider whether or no you come to the conclusion that those diseases or complaints under which the children were so suffering were such complaints as were within the practice detailed by Mr. Cupiss, a very respectable gentleman, and the other gentleman who was called after him. What Mr. Cupiss said was this: "I prepared my medicine when a patient came into a shop and asked for a remedy, to ascertain what was the matter with him, if possible, I would examine his tongue and feel his pulse"—pointing to the same things that were done here—"and then made up the medicine." In cross-examination he says: "I prepared according to their receipt. I never visited a patient. My idea is that I might exercise," so and so. "I never dealt with any case that I thought dangerous."

The other gentleman, Mr. Parsons, says he agrees with that. Then he explains that by simple complaints he means a cold or an eruption on the skin, cutaneous diseases, or things of that kind.

However, please give your answer. If you think that he did practise as an apothecary, please say so. I will take that separately from the second question. The second question is whether those complaints under which the children were suffering were complaints of the character which it had been the common practice to treat in the trade or business of a chemist or druggist before 1815. Of course the evidence as to that point is naturally limited to a year or two on account of age. You must remember that of necessity gentlemen cannot speak to a great length of time, and you cannot have much of that evidence. You also have the confirmative evidence of continuance of the practice on the part of Mr. Cupiss from 1815 downwards to modern times.

Gentlemen, please consider your verdict, and give me your answer to these questions. Did he act and practise as an apothecary in advising and supplying medicines, or both? Secondly, as to the complaints he so attended, were they complaints within the custom as proved by Mr. Cupiss and Mr. Parsons?

Mr. Morgan Howard: While the jury are considering their verdict I submit to your Lordship on the authority of that case in Barnewell and Adolphus, that if the jury find these facts to be done which were proved, your Lordship would direct them as a matter of law that he was acting as an apothecary.

Mr. Justice Field: I will consider that question. I know it was done by Lord Denman; but I doubt whether I should like to take that responsibility. I will consider the effect of that by and by.

Mr. Morgan Howard: The scarlet fever case, I do not think, your Lordship before mentioned to the jury.

The Foreman: My Lord, we find that the defendant acted as an apothecary in taking cases that were dangerous.

Mr. Justice Field: That is a verdict for the plaintiff on both issues. The verdict is quite clear of any doubt. I shall give judgment for the plaintiff.

Mr. Morgan Howard: I should ask for judgment, as I stated yesterday, only for one penalty.

Mr. Justice Field: Quite right. It will be judgment for one penalty. And, I think, you ought to have the costs.

The Associate: Judgment for £20 and costs.

Mr. Justice Field: £10 is it not?

Mr. Morgan Howard: £20 my Lord, is the penalty.

After a short pause:—

Mr. Justice Field: Mr. McIntyre, is there a measure before Parliament?

Mr. McIntyre: I think not anything that touches this.

Mr. Justice Field: I think it might be considered by chemists and druggists whether they should not communicate with the Apothecaries' Company and see whether something might be done. I cannot help thinking there might be some modification.

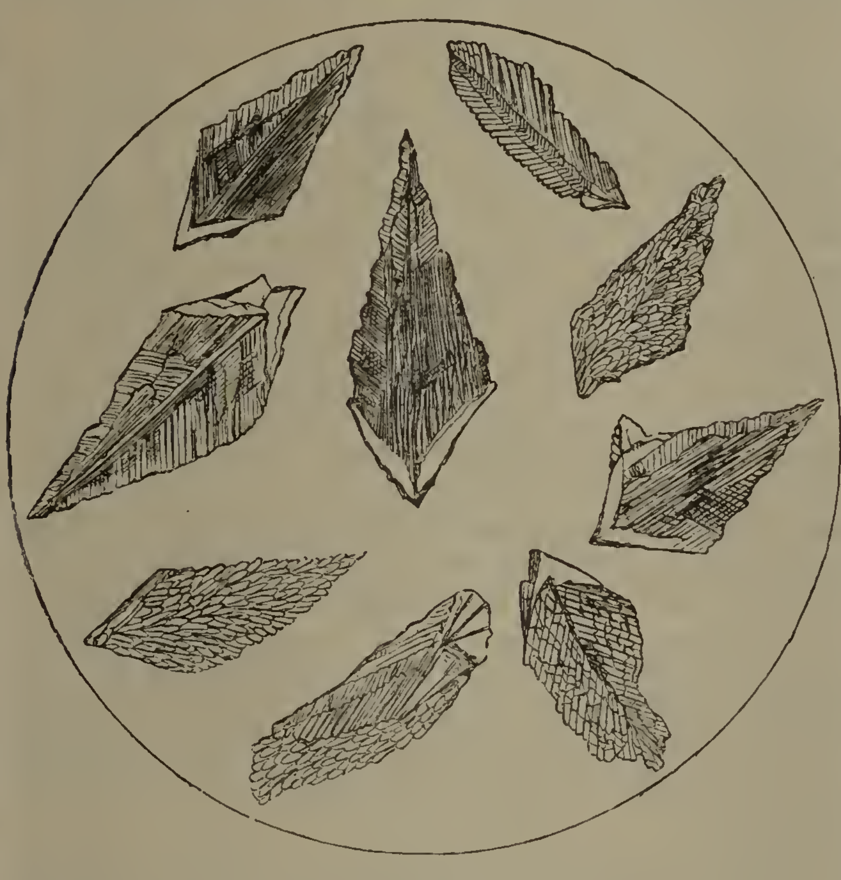
Mr. Howard: My Lord, I think I may say on the authority of my client, who I believe attended a deputation to the Duke of Richmond a day or two ago, that this question has been raised, and I believe his Grace has taken it into his consideration. I am not clear that there is not a proposal to transfer to the Medical Act the penalty which at present is to be found within the four corners of the Apothecaries Act. Probably that will have a beneficial effect. The intention of the Legislature would seem probably to remain the same.

MECONOIOSINE, A NEW DERIVATIVE FROM OPIUM.

BY T. AND H. SMITH.

In the final isolation of meconine, the oleaginous-like liquid containing it, upon being left to itself for some days, sets into a mass of crystals. Those crystals, upon being drained and cautiously washed with cold weak spirit, are to be boiled in a large quantity of water. The filtered liquid gives a crystallization of meconine, and the mother liquor, when concentrated, and upon being set aside for a time, yields beautiful leaf-like crystalline masses of the body to which we have given the name of Meconoiosine.

This remarkable crystalline form, which, in its impure state, is assumed by meconoiosine, as well as the brown colour of the crystals, enables this body to be readily distinguished from the soft and nearly white meconine, which crystallizes along with, and upon it, in a manner not unlike the incrustation of minute shells upon a rock. If this meconine be now



Sketch of crystals of impure Meconoiosine, of natural size.

removed, the meconoiosine, by means of a few crystallizations from hot water, with the aid of charcoal, may be obtained in the pure state, free from colour.

This substance is especially interesting because that now, in it, a second chemically indifferent body, existing in opium is met with. Hitherto meconine alone has been distinguished by this characteristic. Moreover, the respective chemical constitution of those two opium products reveals an apparent relation, meconine being represented by the formula $C_{10}H_{10}O_4$, and meconoiosine by that of $C_8H_{10}O_2$. Both bodies are freely soluble in alcohol and ether, but as regards their solubility in water, the two substances present a striking contrast. Meconine is very slightly soluble in cold water; and in boiling water, unless in the proportion of about 1 in 50, it refuses to dissolve, remaining at the bottom of the liquid, like a heavy oil. Meconoiosine on the other hand, is soluble in 27 parts of cold water, while, in boiling water, it is soluble to almost any extent, forming, as the heat rises, and before being shaken up, a syrupy solution at the bottom of the liquid.

We have not yet ascertained the boiling point of meconoiosine, but it has been heated to 280° C., without boiling. It melts at 88° C.

When heated with slightly diluted sulphuric acid, and when the evaporation has reached a certain point, meconine produces a beautiful green colour. With meconoiosine, under the same circumstances, the coloration is deep red, becoming purple.

In our case at the Paris Exhibition are shown crystalline specimens of meconoiosine, both in the pure and in the impure form.

THE TURPENTINES AND RESINOUS PRODUCTS OF THE CONIFERÆ.

BY DR. JULIUS MOREL,

Professor of Chemistry in the Industrial School, Ghent.

(*Continued from page* 887.)

XVII.—OIL OF SAVIN.

Synonyms.—L.: Oleum Sabinæ æthereum; Ætheroleum Sabinæ; Essentia Sabinæ.—F.: Essence de Sabine; Oleule de Sabine.—G.: Sadebaumöl.

Botanical Source.—*Juniperus Sabina*, L.

Herba Sabinæ, Plin., Hist. Nat. xvi, 92; xxiv. 60.
Juniperus Sabina α vulgaris, Endl., Syn. Conif., 22.
Juniperus Sabina arborea, Hort.
Juniperus Lusitanica, Will., Dict., No. 11.
Juniperus Sabinà, Linn., Spec. 1472 (excl. var. β); Willd., Sp. (in not.) iv. 892; Pall., Fl. Ross., xi. 15, t. 56, f. 2; Fisch., Plant. Schrenk., ii. 13; Duham., Art., 2, t. 62; Desf., Hist. Arbr., ii. 589; Loisel, Nouv. Duham., vi. 48; Schonn., Ann. Sci. Nat., 1845, 245; Endl., Syn. Conif., 22; Lindl. and Gord., Journ. Hort. Soc., v. 201; Knight, Syn. Conif., 12; Carr., Man. des Pl., iv. 310; Tr. Gen. Conif., 34; Gord., Pinet., 109 (excl. syn.).
Juniperus Sabina stricta, Hort.

In England the plant is known under the name of the common savin; in France as *sabine;* and in Germany as *Sadebaum*, *Sevenbaum*, and *Jungferpalme.*

The savin is a diœcious tree, met with in the Alps and Pyrenees, in Italy, Provence, Spain, the Crimea, the Caucasus, and even in North America. The young branches, usually bearing male flowers or fruit, are collected. Leaves occur under two forms upon the same plants; these have been referred to distinct varieties, one under the name of the "tamarisk-leaved savin," and the other as the "cypress-leaved savin."

Preparation.—Savin oil is obtained by distillation of the branches and fruits of the savin with water, the quantity of essential oil obtained depending upon the part of the plant employed. Thus the young branches in the fresh state yield only 1·30 per cent. of essential oil, whilst in the dry state the yield is about 2·5 per cent. The fresh berries give as much as 10 per cent. of essential oil. The wood does not yield any essential oil upon distillation.

Characters.—Savin oil is colourless when fresh or rectified, but more frequently it is pale or deep yellow. It gives off a strong and disagreeable odour, and has a resinous, bitter, and acrid taste. It has a specific gravity of from 0·89 to 0·940, and begins to boil between 155° and 161° C. Its reaction is neutral to litmus. Examined in a column 50 mm. long it rotates the plane of polarized light 27° to the right. This was the result obtained by Flückiger in operating upon a recent specimen of oil extracted from savin cultivated at Mitcham, and it corresponded to that obtained with a sample of oil, ten years old, from savin collected in the Vaud canton. But an oil kept in a badly closed flask, so that air has access to it during any length of time, has a much lower rotatory power.

Savin oil is soluble in two parts of 84 per cent. alcohol, and in all proportions in absolute alcohol and even in 93 per cent. alcohol. In contact with iodine it gives rise to an explosion, accompanied by considerable elevation of temperature. The addition of nitric acid to the oil produces an energetic and tumultuous reaction. Sulphuric acid produces a slight turbidity and a deep red coloration, which upon dilution with alcohol becomes raspberry red; the mixture remains turbid when heated. Treatment with hydrochloric acid gives rise to a crystallizable compound.

Composition.—Savin oil is a hydrocarbon isomeric with turpentine oil, $C_{10}H_{16}$. The plant contains besides a resinous matter and tannin.

Adulterations.—An addition of turpentine oil to savin oil can be easily detected with the aid of alcohol, since 1 c.c. of a mixture of 9 parts of recent savin oil with 1 part of turpentine oil requires 3 c.c. of 80 per cent. alcohol to make a clear solution, whilst 1 c.c. of a mixture of the commercial oil with turpentine oil in the proportion 3·1, requires 8·6 c.c. of 80 per cent. alcohol.

Uses.—Savin oil constitutes the active principle of the plant. It is employed as an emmenagogue, but caution is required in its administration. For internal administration the dose is from 2 to 6 drops. Externally, the oil as well as the powdered leaf is used as a vesicant.

XVIII.—OIL OF CEDAR.

Closely allied to savin oil is the oil of *Juniperus Virginiana*, L., known in this country as the "red cedar" or "North American savin," in France as the "*cèdre rouge des jardins*," and in Germany as the "*Cedernbaum.*" This plant closely resembles the *Juniperus Sabina*, but contains less essential oil. In the United States and Canada the oil replaces that yielded by the savin. The glandular cavity of the leaf is much smaller than that of the savin leaf.

In commerce the essential oil of cedar is met with as a soft crystalline mass, white, or slightly coloured yellow by the colouring matter of the wood. It is composed of two principles, one a liquid hydrocarbon named "cedrene," the other an oxygenated solid compound. To separate the solid compound, the oil is distilled and the portion passing at 300° C. collected, the thermometer being placed in the midst of the boiling liquid. The distillate consists of the solid body, mixed with a little of the liquid, which is removed by pressing it in a cloth. The solid portion is purified by crystallization from alcohol. In this way it can be obtained in magnificent silky crystals, having an aromatic odour and a slightly pungent taste, melting at 74° C. and distilling at 282° C. without alteration. It is very slightly soluble in water, very soluble in alcohol. Sulphuric acid imparts to it an amber colour. Walter represents this solid essence by the formula $C_{16}H_{28}O$; Gerhardt attributes to the formula $C_{15}H_{26}O$.

The liquid portion of the essential oil, or cedrene, is obtained by distillation after separation of the solid portion, and is rectified by a distillation from potassium. It can also be obtained by treating the solid portion with phosphoric anhydride and rectifying the product several times in the presence of the anhydride or of potassium. The liquid thus rectified boils at 237° C. and has a sp. gr. of 0·98. Walter represents it by the formula $C_{16}H_{26}$, Gerhardt by $C_{15}H_{24}$.

The essential oil as obtained by distillation rotates to the right the plane of polarized light; but its rotatory power is inferior to that of savin oil. It is soluble in one part of alcohol, commences to fuse at 74° C., and distils below 282° C. In contact with iodine it produces no explosion.

In North America this oil is employed as a tænifuge and an abortive, and several cases of poisoning by it have occurred. The wood is employed in the manufacture of pencils.

The *Juniperus Phœnicea* also has much resemblance to the savin, for which it is sometimes substituted. In the south of France it is improperly called "savin," but this monœcious plant has not the odour of the savin, and the backs of the leaves do not present the resiniferous vesicules of *Juniperus Sabina*. It is also met with in Greece, Syria, and the neighbouring isles.

XIX.—COLOPHONY.

Synonyms.—G. Colophonium; Geigenharz.—F. Colophane; Brai sec; Arcanson.

The name colophony is given to the residue obtained when turpentines are submitted to distillation in order to separate the essential oil. This residue is run off through a tubulure fitted at the bottom of the retort, and while liquid is passed through a filter having very fine metallic meshes, and then left to harden. The colour of the colophony thus obtained varies according to the method followed in its preparation. If the turpentine be distilled with steam, the colophony obtained is pale yellow, transparent or translucent, in which case it contains a small quantity of water. If the last traces of this water be eliminated by heating it at a higher temperature, or if the distillation be carried on over a bare fire, a brown transparent colophony is obtained, which may become black and dull if the temperature be raised during the last moments of the distillation.

The various kinds of turpentine each yield a colophony, but that which is met with in the European markets, with the exception perhaps of this country, is most frequently derived from common Bordeaux turpentine. In England, American colophony is most frequently met with, differing from the European in the yellow variety being slightly greenish and more transparent, and in powdering between the fingers, giving off an aromatic odour.

In France brown and black colophony still bear the name of *brais;* but although it is true that the colour depends upon the temperature used in the distillation, it would appear also that the origin of the turpentine is not without influence upon the colour of the product. Thus, for example, the colophony from Sweden and Norway, although prepared at a relatively low temperature, has a deep brown colour that appears red by transmitted light.

Characters.—Generally colophony has a feeble but characteristic odour; the taste is not very marked.

Yellow colophony, from common turpentine, softens at 80° C., and fuses completely at 100° C., giving a limpid yellow liquid. Heated to about 150° C. the liquid becomes darker, without losing weight;

at a higher temperature the colophony is decomposed. In the pure state it should be homogeneous, transparent, amorphous, and very friable, and have a sp. gr. of 1·07. It is insoluble in water, and between 15° and 20° C. it requires eight parts of 88° alcohol to dissolve it; the addition of caustic alkali favours its solution. It dissolves pretty freely in ether and fatty oils, but in acetone and benzol it dissolves in nearly all proportions.

When colophony is treated with boiling alkaline solutions it takes up the elements of water to form abietic acid, which then unites with the alkali present to form what is known as a resin soap, which is employed industrially mixed with other soaps. Sulphuric acid dissolves colophony with a deep orange colour. Nitric acid does not exercise any action upon this resin.

The colophony of Venice turpentine is soluble in two parts of hot 75° alcohol; stronger alcohol dissolves it more freely. Dissolved in half its weight of acetone and introduced into a column 50 mm. long it rotates the plane of polarized light 12·6° to the right.

The resin of Canada turpentine is also dextrogyre; two parts completely freed from essential oil and dissolved in one part of benzol rotating the plane of polarized light 8·5° to the right. It will be remembered that the essential oil has an inverse rotation and to nearly the same degree. In its chemical composition it differs from the resin of common turpentine.

The resin of Burgundy turpentine, dissolved in its own weight of absolute alcohol, rotates the plane of polarized light 3° to the left.

The resin of Strassburg turpentine, dissolved in half its weight of benzol, is slightly dextrogyre. It is completely soluble in glacial acetic acid, but incompletely soluble in absolute alcohol and in acetone. Strassburg turpentine contains about 72·4 per cent. of this resin.

Seen under the microscope the different varieties of colophony do not present the same characters. All those which are hard and vitreous are perfectly homogeneous and do not show any crystalline texture when examined by polarized light. The colophonies that are soft, dull, and have a fatty aspect, such as those that still contain oil of turpentine, consist of a nearly homogeneous hyaline substance, mixed with crystals of abietic acid and a granular matter.

Composition.—According to Undervorben the resinous matter of the turpentines is composed of two acids, pinic acid, or resin α, and sylvic acid, or resin β, and a neutral substance that he has called resin γ. Pinic acid and resin γ are soluble in 72° alcohol; sylvic acid is insoluble in it. Pinic acid and sylvic acid have the same composition, but pinic acid is amorphous and of a yellowish-brown colour, whilst sylvic acid crystallizes in rhombic prisms. Strecker has since stated that pinic acid is only an amorphous modification of sylvic acid.

The most recent investigators represent colophony of common turpentine by the formula $C_{44}H_{62}O_4$. Upon agitating it, coarsely powdered, with hot dilute alcohol, it takes up the elements of water and is converted into abietic acid ($C_{44}H_{64}O_5$). In this manner colophony can be made to yield 80 to 90 per cent. of its weight of abietic acid, and for this reason Maly and other modern authors have considered it to be an anhydride of that acid. Probably the resins from other conifers have an analogous composition. Consequently the plants of this family would contain only the anhydride of abietic acid, as the recent resinous liquid is limpid and becomes amorphous when the essential oil has been eliminated. Exposed to air the liquid loses its essential oil, takes up a certain quantity of water and solidifies as the crystalline acid. This modification is easily recognized with the assistance of the microscope in drops of turpentine that have just run from the trunk. For this purpose it is preferable to collect the limpid drops of turpentine from the *Pinus sylvestris* or *Abies excelsa* and preserve then in a bottle, protected from all moisture. In such a case the turpentine remains transparent, and if afterwards water be added crystals of abietic acid are formed which render it opaque. This explains also why turpentines, while flowing from the tree, lose gradually their transparency, and why they dry when exposed to the air and become harder and more granular. It also enables it to be understood why turpentines, before they have lost their essential oil by evaporation or oxidation, and before the crystalline modification has taken place, remain transparent if the essential oil be separated by distillation in the absence of water. Distillation in the presence of water is the explanation of the opacity of the residuary resin. Thus amorphous colophony preserves its transparency even in a humid atmosphere, and does not appear to become converted into abietic until it is in the presence of the molecule of water necessary for the transformation.

Laurent has also extracted from French turpentine pimaric acid, which corresponds in composition with sylvic acid. This acid might be supposed to have the same relation to abietic acid as pinic and sylvic acids. But Duvernoy and Flückiger allege that pimaric acid, of which galipot is for the most part constituted, differs from these two acids. When extracted from *Pinus maritima*, according to Laurent and Cailliot, it commences to melt at 125° C., and the latter chemist has isolated it under the form of ellipsoid crystals, which quickly absorb oxygen from the air and are consequently not stable. Alcohol containing 5·5 per cent. of this acid in solution rotates the plane of polarized light strongly (92·7°) to the left. The same acid, dissolved in alcohol or bisulphide of carbon, has a dextrogyre action if the temperature be raised.

The resin from Canada turpentine consists, according to Flückiger, of two ingredients, one soluble in boiling absolute alcohol, the other insoluble in it, but soluble in ether. The portion soluble in alcohol amounts to 78·7 per cent.; the portion soluble in ether to 21·3 per cent. Neither the alcoholic nor the ethereal solution gives crystals upon evaporation. Both portions redden litmus, but Flückiger failed to isolate a crystallizable resin acid like abietic acid, which is obtained easily by the treatment of ordinary colophony with dilute alcohol. Glacial acetic acid behaves toward both resinous substances similarly to absolute alcohol. Caustic alkalies dissolve neither Canada turpentine nor its resin.

Uses.—Dark coloured and only partially transparent colophony, the French "*brais*," is used in the preparation of "yellow resin" or "pitch resin." For this purpose* the colophony is put into boiling water and the mixture beaten up in a large trough

* Planchon, Traité pratique de la Détermination des Drogues Simples (1875), vol. ii., p. 214.

for about twenty minutes. As soon as the dark coloured colophony has assumed a light yellow tint, it is run into moulds and dried. In this way it absorbs 10 or 12 per cent. of water and becomes perfectly opaque and pliable; its terebinthinate odour is rather marked. This resin is especially prepared from the products of the Bordeaux pines.

In medicine, colophony is employed in the form of a powder as a hæmostatic, and it also enters into the composition of certain plasters and ointments.

It has an industrial application in the manufacture of resin soap, sealing wax of inferior quality, varnishes and cements. It is also employed in the soldering of metals, and the rubbing of violin bows.

(*To be continued*).

THE DISPOSAL OF REFUSE FROM CERTAIN MANUFACTORIES, IN CONNECTION WITH RIVER POLLUTION.*

BY J. FALCONER KING, F.C.S.,
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This subject is one which both chemists and engineers have for years been considering and attempting to grapple with, and with, I am sorry to say, but indifferent success. The favourite plan at present with engineers is to get the refuse material conveyed as quickly and quietly as possible to the sea. When this can be done without annoying any one it is carried out without a moment's hesitation even though it infers a wanton waste of valuable material which might be profitably utilized. When this cannot be done other modes of disposal have to be adopted, and it is here that the aid of chemistry is invoked with occasionally beneficial and sometimes even profitable results. When no attempt at purification or utilization of the refuse from a town is made, the adjoining river, if there happens to be one, is transformed into a gigantic drain by which the sewage after having duly polluted the surrounding air is removed. The best example I know of this style of disposing of sewage is to be found in the Clyde at Glasgow Bridge. If you pay a visit to that odoriferous locality any tolerably warm summer day about the time of low water, and take a sail, say for a mile or two, in the cabin end of one of those floating steam palaces which are borne so plentifully on the bosom of this magnificent sewer, you will have the best evidence as to the disagreeable effects of this objectionable mode of disposing of sewage. The evil effects and the wasteful nature of the system which we at present pursue are, however, well known and admitted, the difficulty is to find a better; and I am sadly afraid this difficulty will remain an insuperable one as long as our present ideas regarding the use of water in our sanitary arrangements remain as they are. There is not the slightest doubt that we annually send down our sewers thousands of pounds' worth of fertilizing material, which, in consequence of being so extensively diluted, is of little or no value. And so I suppose we will continue while our money lasts to float up in our harbours and rivers cargoes of Peruvian guano costing £20,000 and £30,000 each, on what is often little more than weak solutions of the very materials which confer on the guano its agricultural value, and which are flowing towards the ocean to be lost to us for ever. As all plans, however, with the exception perhaps of irrigation, which have been tried hitherto for the utilization of sewage have, to say the least, not been very successful, I will not occupy time with this part of the subject but pass at once to the consideration of some processes for the treatment of other forms of refuse, which I think I may say have at least not been altogether unsuccessful. I do not wish you, however, for a moment to suppose that I consider the disposal of sewage an unimportant matter; on the contrary I think a system by which it is said we throw away material every year of the value of fifteen millions sterling and in doing so, not only suffer direct loss, but besides cause an immense amount of disease, is of the very greatest importance, and is one which demands the most careful and anxious consideration.

Of late years I have been engaged in several cases of so-called river pollution in which I have had occasion to deal with many difficult kinds of polluting matter. I shall, however, in the present paper refer more particularly to two cases, which as they are of a widely different nature may serve, even without reference to any others, to illustrate sufficiently the remarks I have to make. These cases are at the river Esk at Lasswade and the river Teviot at Hawick, and in which are concerned two of the most important river polluting industries to be found in this part of the country. I refer to paper making, and to the dyeing and scouring of cloth. I have chosen these two to illustrate what I have to say to-night; first, because of their magnitude they are of great importance and possess a certain amount of general interest; and second, because in the case of both of them, a very decided step in advance has been made in abating the nuisance caused by the discharge of this refuse. The first point we have always to consider in dealing with any plan or process for the prevention of river pollution is that of expense. Sometimes we are merely asked what will it cost; but occasionally, manufacturers having become rather exacting in consequence of some chemical schemes for the purification of their outflow, which they were forced to adopt, having turned out very profitable, we are asked how will it pay. It seems to me, however, that this is not the way in which to consider this matter. If a scheme for purification effects its purpose and pays also, good and well; but, if it only does the former, no one, I think, can object, unless of course the outlay amounts to something unreasonable. In the case of the Esk the purification scheme has paid, and I do not suppose the mill owners on the banks of that river would return to their former mode of working, even if they were allowed.

Just at the present time the subject of river pollution, and of course also river purification, is one of very great and peculiar interest to many people in this country. The offenders and those offended against in this matter are alike interested, although on different sides of the question. The peculiar interest which is at present evoked is of course caused by the action which government proposed to take in this matter. Sometime ago, a proposed Bill on river pollution was printed which gave rise, I have no doubt, to a considerable amount of uneasiness in the minds of manufacturers, who, having their works on the banks of rivers, are in the habit of using the water thereof in their operations, and of returning it to the stream in a more or less filthy condition. This Bill, among other things, contained a list of substances which were to be regarded as pollutions, and as such were not to be allowed to enter a river. The provisions certainly are very strict, and I am much afraid that if the Bill as it stands becomes law, it will have a most seriously damaging effect upon the trade of the country. While there is no one who would not deplore the advent of such a result, every one who has really the good of the country at heart, must feel that it is high time something were done to put an end to this gigantic nuisance, which is every year becoming worse, and will continue to do so, I am very much afraid, until decided action in one form or other is taken to compel the polluters to mend their ways. This something, I think, should not consist in fastening on one manufacturer or even one set of manufacturers, and forbidding him or them under heavy penalties to throw certain materials into rivers. Such a mode of procedure simply means, to many a manufacturer, ruin. A much better plan, I imagine, would be to appoint a body of scientific men to inquire fairly into the matter, and to ascertain

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* Read at an Evening Meeting of the North British Branch of the Pharmaceutical Society, April 19, 1878.

and report as to the pollutions existing in each large river, and also to suggest means for the amelioration or removal of such nuisances. Of late years, as I have already said, I have been very much consulted on this subject, both by proprietors who consider themselves aggrieved by the state in which the water of their rivers was sent to them, and by manufacturers who thought they had been hardly dealt with by being threatened with all the pains and penalties of the law for simply what in their usual buisness they had been doing for years. In almost all of these instances into which I had an opportunity of inquiring, I found the absence of that which is almost a *sine quâ non* to insure success in having this evil rectified, I mean co-operation, and what, for want of a better expression, I call a meeting-half-way spirit on the part of both sides. It is almost as idle for proprietors in a manufacturing country such as this has become to insist upon having the rivers in a state of pristine purity, as it is impolitic and foolish for manufacturers to imagine that they are to be allowed to go on unchecked, and with impunity, making those rivers mere drains, and sending them down through the country which they were intended to improve and beautify, coloured all the hues of the rainbow, containing poisons of every kind, and giving off odours which render their banks and neighbourhood noisome and unsightly, instead of what they should be, and might still be, pleasant and salubrious places of abode.

In the neighbourhood of Edinburgh many of the streams are still comparatively pure, while others again are certainly foul enough. The river Esk, for instance, to which I have referred and which as every one knows has been the source of much contention, occupies a sort of midway position. It is not exactly, at all events by the time it has passed Lasswade, as pure as one would like to see it, nor yet I think as it might be, but it is certainly nothing like the water of Leith as that is seen in the vicinity of Canon Mills. The chief manufacturers, and I am afraid I must add the chief polluters, on the river Esk are the paper makers. There are no less than eight large mills on this river, and when we reflect upon the amount of washing, bleaching, etc., which has to be done at each of these mills we can easily account for some pollution in the river. Of late years a great deal has been done in this river by way of abating the nuisance; so much indeed has been effected that now I have seen it really look like an ordinary stream. Some ten or twelve years ago, however, its condition was simply scandalous, the water being frequently quite invisible at certain points owing to the thick persistent froth which floated on it completely covering the surface. This state of things, however, has been very much amended, and not only has the amenity of the river been improved by the change, but as I have already indicated a great saving has been effected to the paper makers. Tons of valuable material, which used to go down the stream, dealing death and destruction to all the inhabitants thereof, are now carefully saved and re-used. In order to describe properly how this saving and purification is being effected I should tell you that one of the essential operations in the manufacture of paper at the present day is the boiling of esparto grass in strong solutions of caustic soda. This is done by placing the grass in a large boiler furnished with a lid where it is subjected to the action of the boiling alkaline solution for several hours. At the conclusion of this process the resulting thick dark coloured strongly caustic liquid, containing a large quantity of organic matter in solution and possessing no end of frothing power, is either used again in a similar operation, or thrown into the river. Of course I am speaking now of things as they were before the manufacturers were compelled to mend their ways. The intolerable nuisance, however, which was caused by the large quantities of this most offensive liquid which was allowed to find its way into the Esk, brought about a change; legal measures were taken to compel the manufacturers to abate the nuisance and thus gave rise to the adoption of the famous recovery process which is now I suppose used voluntarily by every large paper maker in Scotland and very possibly in England also. The process is shortly this. The thick brown alkaline liquid, which is the root of all the evil, instead of being allowed to flow into the river is run into large evaporating pans or roasters where it is evaporated and calcined, then dissolved in water and causticized by being boiled with quick lime, when it can be used again.

By the faithful carrying out of this process no doubt a very great improvement has been effected, but still there is room for some more. The effluent water from these mills even though it does not contain the caustic liquid is hardly pure enough to send into a river, and in order to render it so different processes have been tried, three of which I superintended during their trial on the effluent from one of the mills on the Esk. These processes are, as all such processes must absolutely be, extremely simple and consist merely in adding to the impure water different materials which will, at a moderate cost and in a reasonable time, effect the partial or total precipitation of the polluting matter. The first process, which I will call the iron process, is carried out by precipitating the effluent with perchloride of iron and lime. The second process is somewhat similar, but instead of iron we use alumina. The third process, which in some respects is the best of the three, was first proposed by a friend and former student of my own, Mr. William Durham. It consists in adding to the impure liquid sulphate of alumina and subsequently a sufficiency of carbonate of baryta.

Even by this process and working on a weak liquid, material is recovered which can be turned to useful account and perhaps made a source of profit.

In the case of the dye work refuse we have quite a different effluent to deal with. Besides a large quantity of colouring material in the form of dyes there is generally a large quantity of soapy matter which is perhaps a form of pollution as objectionable even as refuse colouring material. This soapy substance gets into the rivers and communicates to a large body of water a disagreeable milky appearance, and further, owing to its greasy sticky nature it adheres to such things as stones over which it passes, and is altogether very offensive.

As has been done, however, with the alkaline refuse from the paper mills, this polluting material is now worked up with profitable results.

We have still, though, the colouring matter from the dyes to get rid of, and unfortunately this is a most powerfully polluting substance. A very little of it goes a long way in this direction, and to look at the great volumes of dark highly coloured liquid which pours from the works of Hawick into the river there, one would think it almost impossible to effect even a very partial purification only of the black dirty stream, and yet I have so far been successful even with this Augean stable.

In these purification processes what I always attempt to do is to produce a compound with the polluting matter which by subsequent treatment I can render insoluble and precipitate.

Now in this Hawick effluent, at least in some of it, and also in some of the effluent from Paisley—with the sewage of which town I have also been engaged—I find this compound ready made. It arises I have no doubt from some of the mordant used in the dyeing process, and all that has to be done with the liquids containing this compound is to add some substances which will make that insoluble, or at all events cause it to precipitate. The substance which I use for this purpose is lime. A very small quantity is sufficient, and where the mordant compound is present in proper proportions the precipitation takes place quickly and completely. The difficulty I have at present with this process is the disposal of the sewage or precipitate which is produced. It will not, I am afraid, be very valuable as manure, and I am quite at a loss to find any other outlet for it. It is quite possible, however, that when once it has been produced in quantity a use may be found for it.

COD LIVER OIL.

Dr. William J. Russell, M.D., Clapham, in a communication to the *Practitioner* for April, says: "Various opinions have been held regarding the curative qualities of cod liver oil. The late Professor Hughes Bennet, by whom the use of cod liver oil was first introduced into this country, was accustomed to regard the darker qualities of oil as the best. Medical opinion has latterly come to regard the paler varieties with more favour, but my own experience leads me to agree with Professor Hughes Bennet. My attention was drawn to the different kinds of oil when attending a phthisical patient during winter in the small fishing town of Anstruther. The medicinal treatment consisted of simple bitter tonics and cod liver oil, which she was at first unable to tolerate, the oil invariably producing vomiting and retching. Being strongly impressed with the importance of persevering in the treatment, she of her own accord suggested trying different samples of oil; to which I assented, not expecting to get a more digestible or palatable oil, but hoping that the stomach might acquire a certain amount of tolerance, and some part of the oil be retained, if it were perseveringly taken. Some time afterwards, on making my daily visit I was surprised and delighted to hear that the last sample of oil had not been vomited, and up to that time—some hours—had not caused much nausea. This last oil was denser in appearance, somewhat like unboiled linseed oil, and slightly darker in colour than the previous samples, which were clear and looked thin like water. Under its continued use the symptoms began to subside, the cough and expectoration diminished, the night sweats and hectic fever disappeared; she constantly gained weight, and when I ceased attending her had almost recovered. I subsequently tried this darker, unmixed, true cod liver oil on several patients, and had ultimately every reason to believe that it was the most easily retained and the most effective.

"The mode of administration was as follows:—The mouth was first gargled with strong salt water to deaden the nerves of sensation; the oil was then taken by itself, and succeeded by a draught of fresh water, to wash it down and prevent it sticking to the mouth. With a view to prevent sickness, pepper was sometimes taken before the oil. On inquiry, I found the darker, denser oil had accidently been made from the livers of the true cod (Gadus Morrhua) only; the usual practice being to include the livers of the closely allied species, haddock (Gadus æglefinus) and ling (Gadus molua). It was much more offensive to taste and smell than the clear oil from the mixed livers, which had a bland taste and very little smell. Four bottles of the different samples of oil being kept on the window-sill of the patient's bedroom: after a freezing night I noticed that the bottle of darker oil was concrete almost to the top, thus showing a very large proportion of margarin, and that the oil with least smell had very little frozen in it. When the darker oil was vomited it was generally within the first three or five minutes, and was apparently due to nausea, caused by its effect on the nerves of taste in the mouth and throat; if retained longer than five minutes it usually caused no uneasiness beyond an occasional slight feeling of nausea. The mixed clear oil and the oils of the haddock and ling are readily taken, and when retained seem equally efficacious; but are much more apt to cause nausea and vomiting some little time afterwards, generally from a quarter to half an hour after taking. This is probably due to decomposition of the oil and formation of acrid fatty derivatives in the stomach, while the darker true cod liver oil seems to be absorbed without decomposition. Fresh cream, with its own bulk of grated biscuit and a small proportion of brandy, is retained by phthisical children, where nothing else can be kept on the stomach. Emulsions of oil, especially those containing phosphorus, are sometimes rejected where pure oil can be taken, apparently from the same cause. I am inclined to think that the oil of the true cod contains either a greater number or more in quantity of the peculiar ethers and extractive matters than the oils of the allied species of fish, and that to this is due its being more easily absorbed by the stomach, as we see in well-cooked meat which develops a number of flavouring ethers.

"The process of manufacture of the oil, considerable quantities of which are made in the town, is as follows:—

"The fish are gutted as soon as landed, and the livers are thoroughly washed, all the bad pieces being cut off, and livers of diseased fish, which are frequently ulcerated and contain parasites, are rejected. While the fish are being gutted the livers are placed in large tubs, and as soon as possible are placed whole in the boiler; steam is not approved of, but slow heat from a coal fire is used; the oil should come up cool to the top, and is skimmed off with a large spoon, and after standing twenty-four hours it is strained through linen and stored for use. The more heat used the darker the oil, and that which rises first is generally thought to be the best. The livers are afterwards used for manure."

FERRUM ALBUMINATUM SOLUTUM.*

BY C. BERNBECK.

Dr. Triese, of Illingen, near Saarbrücken, has added a very valuable and therapeutically important preparation to the materia medica by publishing a formula for the preparation of ferrum albuminatum in the *Berliner Klinische Wochenschrift*. His formula reads as follows: Mix the white of an egg intimately with 10 grm. liq. ferri sesquichlorati by triturating them in a mortar, remove the excess of chloride of iron by washing with distilled water, and redissolve, by macerating for two days, the precipitate in half a litre of distilled water, previously acidulated with twelve drops of pure hydrochloric acid.

Numerous experiments made by me proved that only in the following manner, by carefully avoiding an excess of hydrochloric acid in the ferric chloride, a preparation may be obtained answering to the description given by Dr. Triese. It is well known that the officinal liquor nearly always contains an excess of hydrochloric acid, which in the preparation of ferrum albuminatum will cause a solution of the greater portion of the precipitate, which will then necessarily go to waste by washing. This loss is avoided by using a neutral ferric chloride obtained in the following manner: Dissolve six parts of dry ferric chloride obtained by evaporating the officinal liq. ferri sesquichlorati, in ten parts of distilled water, filter and mix the filtrate intimately with twenty parts of the white of eggs; place the brownish-yellow magma on a moistened strainer, press well with the hands and repeat it several times, after the addition of a little distilled water, until the excess of chloride of iron is removed. Dissolve the residue in half a litre of distilled water, acidulated with twelve drops of hydrochloric acid, by macerating for one or two days, and filter.

Dr. Triese administers this preparation in chlorosis without the addition of phosphorated ether; it must, then, always be freshly prepared. As a remedy for rhachitis he prescribes an addition of twelve drops of a solution of 0·05 grm. phosphorus in 30 grm. of ether to 250 grm. of the iron albuminate solution, which keeps the latter unaltered for at least six weeks, and permits it to be kept on hand for that length of time.

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* *Archiv der Pharmacie*, December, 1877. From *The American Journal of Pharmacy*, March, 1878.

The Pharmaceutical Journal.

SATURDAY, JUNE 8, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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ANOTHER MEDICAL ACTS AMENDMENT BILL.

WHATEVER may be the net result, the session of 1878 will be notable for the large amount of proposed legislation in relation to medical subjects. The introduction of the Dental Practitioners Bill into the House of Commons by Sir JOHN LUBBOCK was quickly followed by the introduction of a Medical Acts Amendment Bill into the House of Lords by the Duke of RICHMOND on behalf of the Government, and now the House of Commons has in its turn had a Medical Acts Amendment (No 2) Bill presented to it by Mr. ARTHUR MILLS.

Besides these there has been the Weights and Measures Bill which, were it to pass as introduced, would go far to render the dispensing of prescriptions impracticable. In each of these measures is to be found matter affecting the interests of chemists and druggists, and at one time prejudicially so. But thanks to the prompt action of the Council of the Pharmaceutical Society the mischief in the Dental Practitioners Bill and the Weights and Measures Bill was promptly scotched, whilst the most careful consideration is still being given to the provisions of the Government Medical Acts Amendment Bill.

The Dental Practitioners Bill, as amended in Committee, now contains an addition to the second part of section 5, calculated to provide that recognition of the rights of chemists and druggists who have been engaged in the practice of dentistry, which we have already pointed out it was only reasonable to expect. This clause, as it now stands, provides that among those who are to be entitled to registration, and subject to that formality, exempt from the penal provisions of the Bill, are to be included persons who at the passing of the Act are *bonâ fide* engaged in the practice of dentistry in conjunction with the practice of pharmacy. We may therefore regard this matter as being virtually settled in accordance with the desire expressed by the Council of the Pharmaceutical Society on behalf of the trade interests of the body it represents.

The position of affairs is not quite so satisfactory as regards the proposed legislation affecting what is termed, somewhat unhappily, "counter practice." The Bill introduced by the Duke of RICHMOND and GORDON, for the amendment of the Medical Acts was, on Thursday night, read a third time, and passed in the House of Lords. Before reaching that stage, however, an amendment was introduced, not very imposing in its apparent dimensions, but at the same time of grave significance as regards the position of chemists and druggists who carry on "counter practice."

In the original draft of this Bill, the schedule of Acts to be repealed included so much of the Apothecaries Act, 1815, as restricts persons who have not obtained the certificate therein mentioned from practising medicine or surgery. This provision, and the effect of it, had not escaped the notice of quiet observers watching the interests of the pharmaceutical body, and it was regarded by them as an effective remedy against the present tendency to strain the Apothecaries Act into a prohibition of any kind of prescribing by persons not having a medical qualification.

Recent events, however, appear to have directed further attention to this provision of the Bill, and to have led to the introduction of the amendment we have above referred to, which proposes that the twentieth or penal clause of the Apothecaries Act is to remain in force, and that sections 9 to 19 and 21 to 24 are to be repealed, as from the commencement of the joint board system of medical examination, together with so much of the Act of 1815 as restricts persons who, though registered in the medical register, have not obtained the certificate of the Apothecaries' Society, from practising medicine or surgery.

The effect of this amendment is to carry out the proposal referred to by Mr. MORGAN HOWARD, at the close of the case, tried two weeks ago, of transferring to the Duke of RICHMOND'S Medical Act the penalty which is at present to be found within the four corners of the Apothecaries Act. If the Bill were to pass with this amendment as it now stands there would be in fact no alteration of the position of chemists and druggists as regards the application of the Apothecaries Act, while the original provision of the Bill was in accord with the view expressed by the Duke of RICHMOND as to the impossibility of prohibiting even strictly medical practice by persons having no legal qualification, and it would have altogether done away with the power of the Apothecaries' Society to interfere with "counter practice" by chemists and druggists.

Such a renewal of the power claimed to be held by the Apothecaries' Society by virtue of the Act of 1815 would, we think, be not only mischievous in itself but diametrically opposed to the desires of the Apothecaries' Society and inconsistent with the opinions of the medical profession.

It is almost superfluous to say, in this place, that the Council of the Pharmaceutical Society, regarding the treatment of disease as beyond the province of the pharmacist in a general way, discourages such practice. At the same time it is impossible for that body to disregard the fact that the circumstances under which medical aid is available to a large section of the public make it imperative upon some, in cases of simple ailments, to have recourse to the chemist and druggist for advice and medicine. It is of course, very difficult to define the true line of demarcation between simple ailments that may be treated in such a way by a chemist and druggist or by any other person, and cases which, being outside their skill, are to be dealt with only by a competent medical practitioner; but we feel sure that throughout the entire medical profession, and more especially among the higher branches of it, there is a full recognition of the necessity under which chemists and druggists are placed in many localities to afford in some measure medical assistance to those who seek it from them. It is indeed with no little satisfaction that we are able to quote in this respect the words of a medical contemporary to the effect that medical practitioners generally do not wish to prevent chemists from giving their customers a bottle of mixture for any simple ailment, though they do object to the practices of those chemists who hold themselves out to the public to give medical and surgical advice and systematically prescribe for and treat disease without regard to the nature or gravity of the cases.

It is not to be wondered at that we find the same paper congratulating the profession upon the result of the late action and the prosecuting associations upon their successful manipulation to that end, even of such a clumsy engine as the Apothecaries Act of 1815. Nor can we disavow a certain feeling of sympathy with these congratulations, since it would be mere affectation to dispute the charge that some chemists and druggists overstep the boundary by which their counter practice should be limited. In doing so they naturally excite the dissatisfaction of medical practitioners who though legally qualified are in other respects on much the same footing as themselves, and are often the keepers of shops, similar to those of the chemist and druggist, for the retail sale of drugs. It is chiefly indeed under these conditions that mutual jealousy of the two classes is developed, and that defence associations take their origin and development with little benefit to either of the parties most materially affected, but with no small amount of damage to better relations between medicine and pharmacy.

THE ADMINISTRATION OF CHLOROFORM.

In order to obviate the inconvenience and danger attending the administration of chloroform to patients suffering from cardiac disease, Professor Occhini has been making some preliminary experiments as to the effect of ammoniacal inspirations immediately previous to the inhalation of the anæsthetic, the theory being that the stimulant action of the ammonia on the nervous and vascular system would counterbalance the depressing influence of the chloroform. The results are said to have been quite satisfactory, and Professor Occhini has come to the conclusion that the tolerance of chloroform can be assured by the preventive use of ammoniacal inhalations.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

Wednesday, June 5, 1878.

Present — Messrs. Atkins, Betty, Bottle, Churchill, Cracknell, Fairlie, Gostling, Greenish, Hampson, Hills, Robbins, Sandford, Savage, Schacht, Shaw, Williams and Woolley.

The chair having been taken by Mr. Williams,

The minutes of the Council Meetings of May 1 and 15, were read and confirmed.

Honorary Members.

A letter from Dr. Squibb, of Brooklyn, was read thanking the Society for electing him as an Honorary Member.

A similar letter was read from Dr. Vogl, of Vienna.

Election of President.

The first business was the election of President for the ensuing year. A ballot being taken in the usual way —

MR. JOHN WILLIAMS

was re-elected President

Mr. Williams in returning thanks for the honour again conferred upon him, said it was both unexpected and undesired, for he felt great doubt whether he had efficiently fulfilled the duties of the responsible post which had been conferred upon him. He would, however, do his best for another year.

Election of Vice-President.

On a ballot being taken—

MR. W. D. SAVAGE

was re-elected Vice-President. He expressed his surprise at the result of the ballot, but said if it was the wish of the Council that he should continue in office he would endeavour to fulfil the duties to the best of his ability.

Election of Treasurer.

Mr. Sandford said he regretted to have to inform the Council that Mr. Hanbury was unable to continue to act as Treasurer. He would, however, beg leave to adopt the same course which he had taken for the last two years of nominating a Treasurer instead of balloting, and he would therefore beg leave to name Mr. Greenish.

Mr. Betty suggested that it would be better to return to the regular course, and take a ballot.

This having been done the result was the election of

MR. THOMAS GREENISH

who briefly returned thanks for the honour.

Appointment of Secretary and Registrar.

Mr. Hampson having moved the re-election of Mr. Elias Bremridge, as Secretary and Registrar,

Mr. Fairlie asked if it was necessary that the two offices should be united in the one person. He had found the register very defective. Possibly the Council had not done its duty in the matter, but he knew as far as Scotland was concerned that there were a large number of names on the register which ought not to be there at all, the persons having been dead many years. There were also other matters which seemed to show that too much work was thrown on the Secretary, and he would suggest that the offices might be separated.

The President said the Council had no power to separate the offices, which were united in one person by the bye-laws. He also pointed out that the defects in the register were not due to any neglect on the part of the central office, but to want of information (from the Local Secretaries and registrars of deaths. The latter were bound to send a copy of the registry of death of any chemist and druggist, and received a fee for so doing, but there were no means of compelling them to send this information and they often neglected their duty in this respect.

Mr. Betty protested against a matter of this kind being brought forward without any notice.

Mr. Atkins said he understood that Scotland was treated exactly in the same way as England, with regard to the lists being issued to Local Secretaries. He had been accustomed as a Local Secretary to receive lists and make all the inquiries he could, and he believed if there were any omissions it was rather a matter for local complaint than anything else.

Mr. Fairlie said he regretted having brought the question forward in any informal way. He would take an opportunity of doing so in a formal manner on a future occasion.

The resolution was then agreed to unanimously.

Appointment of Assistant-Secretary and Deputy-Registrar.

Mr. Richard Bremridge was unanimously re-appointed to this office.

Elections.

Pharmaceutical Chemists.

Betty, Robert Brown ....London.
Turner, George Thomas ....Bristol.

Chemist and Druggist.

Salter, Benjamin ....Shrewsbury.

Associates in Business.

The following having passed their respective examinations, being in business on their own account and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Allan, Alexander ....Inverness.
Baines, Arthur ....Hanley.
Beaton, William ....Twickenham.
Billing, Charles......................Edinburgh.
Brown, George ....Brigg.
Cowie, John ....Falkirk.
Cross, John ....Reading.
Davies, Frank Henry ....Thornton Heath.
Hutchinson, George Bassett ...Westgate-on-Sea.
Kendrick, Alfred ....Harlesden.
Pike, John..............................London.
Staning, Walter ....Hull.
Stooke, Arthur ....Milton next Sittingbourne.
Summers, Frank ....Bury St. Edmunds.
Townend, Thomas Francis ......Bishop Auckland.
Walker, Benjamin ....Tetbury.
Wardle, William Stephens ......London.
Wilson, Richard Edward.........Dartford.

Modified.

Beer, James Henry Elias.........Calcutta.
Cooper, Thomas ....West Smethwick.
Dodds, John Henderson ....London.
Jones, William ....London.
Sharman, William ....London.

Associates.

The following having passed their respective examinations and tendered their subscriptions for the current year were elected "Associates" of the Society:—

Minor.

Clayton, John William ....Preston.
Harding, Christmas ....Denbigh.
Massey, Richard Francis.........Lower Tooting.
Russell, Matthew Rawlings ...Whitehaven.
Street, Walter Charles...........Lincoln.
Roberts, Thomas ....Margate.
Thompson, John Hartley.........Sheffield.

Modified.

Fawthrop, James ....Yeadon.
Judge, James........................Kilburn.

Apprentices or Students.

The following having passed the Preliminary examination and tendered their subscriptions for the current year, were elected "Apprentices or Students" of the Society:—

Althorp, Arthur ....Shipley.
Bowker, Ellis ....Radcliffe.
Burchell, Robert Henry ....Kettering.
Chaloner, Henry ....Hyde.
Chattwood, Joseph ....Manchester.
Clerke, William Burdett.........Leamington.
Davey, Thomas George ....Tregoney.
Davis, William.....................Ashford.
Desborough, James George, jun. Stamford.
Frost, Frederick Philip ....Bury St. Edmunds.
Greaves, Edward Harrison ......Bristol.
Harburn, Alfred ....London.
Hewlett, James.....................Northwich.
Jones, David Edward ....New Quay.
Kidner, Henry Richard Charles Bristol.
Kinross, William Mallock ......Edinburgh.
Knight, Charles ....Gloucester.
Lewis, John ....Hanley.
McBeath, John William ....Darlington.
Manners, John ....Shildon.
Matthews, John George ....Douglas.
Mead, Francis Henry .. ..Taunton.
Meadows, John Martin ....Swindon.
Thomas, Richard ....Llanfyllin.
Young, Ernest Alfred ....London.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a fine.

Admission of Women to the Society.

The President said there were on the list the names of three ladies who had applied for election. He did not know whether any gentleman would propose them.

Mr. Hampson moved that Miss Isabella S. Clarke be elected a member of the Society. He said that in discussing this matter it was impossible to forget what took place at the annual meeting; but at the same time there had also been an election of members to Council, which would to a certain extent express the opinion of the country even upon this question, though it may be considered a minor one. Indeed, he thought the election was really a better expression of the opinion of the country than the vote of an annual meeting. He therefore considered it quite in order that this question should be again brought forward. It was scarcely necessary, however, to go into the whole question of the admission of women. At the annual meeting there was a majority of two in favour of the principle, though from circumstances with which the Council was acquainted, that vote could not be acted upon. The Council had therefore now to decide on the matter, and he thought it would be in very good taste if it elected this lady who had passed all her examinations with great credit.

The President said he believed there was an error made at the annual meeting, but there was really some doubt about it, owing to the confusion which prevailed, and he was not quite positive that what he did afterwards was right. His own opinion was that the meeting was equally divided, and he could not consider it right for the Council to take a step of so serious a character as admitting ladies into the Society, which was not contemplated by the founders, without a more decisive expression of opinion. Therefore, although he was personally in favour of the principle, he should vote against it at present, considering that very many whose opinions were entitled to great weight were strongly opposed to it.

Mr. Gostling felt that after the strong expression of opinion on both sides of this question at the annual meeting, and as it was declared that the majority was against the admission of ladies, and especially after the letter of Mr. Sandford showing that there was still some doubt how the vote was really given, he certainly could not vote in favour of the motion until a more decisive opinion was given at another annual meeting.

Mr. Shaw said he had always asked himself the question what he ought to do when ladies applied to be admitted. He had looked at the bye-law over and over again, and could not see any objection to the proposal.

The President suggested that the Council need not discuss the general principle; it was rather a question of expediency at the present time.

Mr. Shaw thought it was expedient. With regard to the annual meeting, he was unfortunately away at the time the vote was taken, and one or two other members were also absent, attending at the Privy Council Office, who would probably have voted in favour of the motion. He had objected on former occasions to this question being relegated to the annual meeting, for it was a matter which belonged to the Council. It was the duty of the Council to elect members, and that being so, he thought the application ought to be fairly considered, if there were no special objections against it, and he had heard no sufficient reason raised. It was merely one of private feeling, or of taste, or in some cases of fear lest ladies should make their appearance at that table. Mr. Sandford had said on one occasion that it was very desirable that ladies should occupy that station which in the providence of God they had been called upon to occupy; but that rather reminded him of what Dr. Lyon Playfair had recently remarked with regard to the National Schools, that the children there were taught to pray, "God bless the squire and his relations; and keep us in our proper stations." He did not see that they had any right to keep women in the station which they might fancy was the one belonged to them.

Mr. Betty thought they must as members of Council be bound by their previous conduct. They had left the decision to the Society at large, simply because it introduced such a novel question, that the Council felt it ought to be left to its constituents. He therefore did not think it was quite in order to raise the question again now.

Mr. Fairlie thought the present Council had nothing to do with the resolutions of a previous Council. It was a new Council altogether.

The President said the question left to the general meeting was a question of expediency, the decision of the meeting was so uncertain that in fact it was equivalent to coming to no conclusion.

Mr. Betty was of opinion that the majority present, being members of the old Council, were bound by their previous actions, in the same way as their successors would be bound by the laws that governed them. He was quite willing to abide by the *bonâ fide* vote of the annual meeting, but the vote was uncertain. He was anxious it should be acted upon, which ever way it was, and he suggested that some means should be taken to ascertain what was the real result of the vote. If there were a majority of only one in favour of admitting women, he would accept it, though it was against his own opinion and he had always opposed it. At present, however, it seemed to him quite irregular to bring forward the question.

The President said the recorded vote of the last annual meeting was against the admission of ladies.

Mr. Schacht said there was the adjourned meeting, when it was stated that a mistake had been made, and that if that were corrected the vote would have been in favour of the admission of ladies. He took that adjourned meeting to be conclusive in the matter. He had always said the question ought to be referred to the constituency at large, and it seemed to him there was no escape from the President's last decision, that the majority of two was in favour of the admission of women. A mistake had occurred in the first place, but the final decision was that the advocates of the admission of ladies had the majority. Therefore he considered the members of the Council were bound to vote for the motion.

Mr. Robbins said he understood that the motion was not put at the annual meeting; it was simply the previous question, and even on that he was told that one gentleman had voted against it from mistake, so that in any case the voting would be equal.

Mr. Hampson said he knew of one gentleman who voted on the other side by mistake.

The President said the original motion was never put at all, and it was not to be assumed that the original motion for the admission of ladies would have been carried if it had been put. At the adjourned meeting the motion was put and the Chairman's casting vote was against it.

Mr. Sandford said he should simply address himself to the question of the vote of the annual meeting. It had been decided at a previous Council meeting that the sense of the annual meeting should be taken. So far as the voting was concerned he was prepared to make an affidavit that the voting was as first announced. He was prepared to swear that before any magistrate, and Mr. Carteighe was prepared to do the same. Mr. Mackay, with whom he had had no communication on the subject, had written to the office to say that he was fully able to confirm the statement which appeared in his (Mr. Sandford's) letter in the Journal. He took it, therefore, there was no doubt about the real vote; they were bound by that expression of opinion, and ought not to raise the question again during the present year.

Mr. Betty asked if Mr. Sandford would agree to the Council making an inquiry and taking evidence as to what was the result of the vote.

Mr. Sandford said he was ready to give what evidence he could.

The President said it all turned on this question. The first teller who came to him gave him the number 59; the question was, who was the first teller who gave him the number.

Mr. Sandford said he was ready to swear it was Mr. Wade.

Mr. Fairlie said he was ready to swear that it was Mr. Vizer.

Mr. Atkins thought it would be exceedingly unwise to discuss the general question. Having moved or seconded the resolution that the matter should be referred to the general meeting he would say that as far as he was concerned he only wanted to ascertain, if possible, the opinion of the whole body of pharmacists throughout the kingdom. Now confessedly there was no very definite opinion expressed, and, therefore he did not consider himself bound at all to register the decision of that annual meeting. Mr. Hampson had referred to the election of members of Council as an index to the state of feeling throughout the country; but he did not advise him to press that argument too far, because if he looked at the numbers attached to the names he might find that some of those who stood highest on the list had not avowed their gallantry.

The President suggested that the Council ought not to go into these questions. Every gentleman returned to it stood on the same level.

Mr. Atkins said it could not be disguised that some gentlemen received very large suffrages, and all honour to them for it; and some of those gentlemen he believed were not in favour of the admission of ladies. He regretted to say, being himself in favour of this motion, that on making inquiry in his own neighbourhood he did not find the general opinion coincided with his own. He only wished to say that he did not consider that as members of Council they were bound to put into force the votes of the annual meeting.

Mr. Robbins thought the question raised by Mr. Atkins was a very important one, whether the Council was bound to respect the decisions of the annual meeting.

Mr. ATKINS said that he had not so expressed himself.

Mr. ROBBINS said this question was constantly coming up, whether when a question was referred to the annual meeting, the Council was bound to act on the opinion there expressed. Now the charter unmistakably showed that the annual meeting had power to pass resolutions affecting the government of the Society.

Mr. SHAW submitted that that clause only referred to questions outside the bye-laws.

Mr. ATKINS said he should be the last to treat with any disrespect the opinion of the annual meeting. He simply raised the technical point whether the Council was bound to register the opinion of the annual meeting without any further discussion.

Mr. HAMPSON wished to ask the Council what majority would satisfy it. He very much questioned if Mr. Sandford would be satisfied with an overwhelming majority. He should like to ask him what majority he would be satisfied with.

Mr. SANDFORD said he was quite satisfied with the majority as it stood.

Mr. HAMPSON had no doubt that in a few years he would be dissatisfied with a majority of twenty or thirty in favour of the admission of women. Although he respected the opinion of the annual meeting he thought this was a matter for the Council to decide, because the annual meeting had not the power to elect members; the duty was cast on the Council by the Act of Parliament. A few women desired to become members; they were legally eligible, and it was only a bias on the part of some gentlemen which prevented their having what was their strict right. He still hoped the Council would vote in favour of the admission of women; it would not be flying in the face of the annual meeting, because that face was not yet drawn, or one person drew it in one form and another in quite a different manner.

The motion was then put to the vote, with the following result:—

For—Messrs. Churchill, Fairlie, Greenish, Hampson, Savage, Schacht, Shaw and Woolley—8.

Against—Messrs. Betty, Bottle, Cracknell, Gostling, Hills, Robbins, Sandford and Williams—8.

The vote being equal, the Chairman gave his casting vote against the motion, remarking that the Council evidently very fairly represented the Society at large.

Mr. HAMPSON then moved the election of Miss Minshull and Miss Stammwitz as associates. He said there might be some gentlemen who would think it desirable to admit these ladies as associates though they might object to give them the full privilege of membership.

Mr. SHAW seconded the motion. He said it had been contended over and over again that the word "persons" only referred to those of the male sex, but this could not be so because the same word was constantly applied to women, as, for instance, with regard to contributors to the Benevolent Fund.

Mr. BETTY said Mr. Shaw's argument only went to this, that they might admit ladies if they pleased, which no one disputed. He was astonished to find his friend Mr. Hampson, who was usually so bold, on this occasion beat a retreat. Before now he had repudiated any compromise, and said, on the principle of ladies being admitted, it must be insisted on.

Mr. SCHACHT thought Mr. Betty misunderstood the position, inasmuch as these were different individuals.

Mr. BETTY said he quite understood that.

Mr. SANDFORD did not see how the Council could admit ladies as associates if it was not proposed to admit them to membership.

Mr. ATKINS remarked that Mr. Hampson, so far from having beaten a retreat, had shown the usual quality of an Englishman of not knowing when he was beaten.

Mr. HAMPSON said he had no disposition at all to retreat in this matter; he thought the members of the Council were bound to consider every question which came before them in a formal manner. The two were quite distinct propositions.

The vote was then taken, with exactly the same result as in the previous one.

The motion was therefore lost.

APPOINTMENT OF COMMITTEES.

The Council next proceeded to appoint the Committees.

Mr. SCHACHT repeated a suggestion he had previously made, that two committees should meet simultaneously. He thought the object of having committees to do the business was that certain gentlemen should make themselves specially acquainted with a particular kind of work, and if this were carried out other members would be more inclined to bow to their opinions.

After a good deal of conversation as to the mode of constituting the various committees, it was resolved that the General Purposes Committee should in future take the duties assigned to the Law and Parliamentary Committee. Also that the Finance Committee and Benevolent Fund Committee should meet at the same time, so as to allow of the General Purposes Committee meeting at an earlier hour.

The following were then appointed:—

General Purposes.—The whole of the Council, four to form a quorum, to meet at six o'clock on the evening before the Council Meeting, and at such other times as may be required.

Finance.—Messrs. Bottle, Churchill, Cracknell, Fairlie, Gostling, Robbins, and Schacht. To meet at four o'clock on the day previous to the Council Meeting.

Benevolent Fund.—Messrs. Betty, Bottle, Greenish, Hampson, Mackay, Rimmington, Robbins, Sandford, Shaw, and Woolley. To meet at the same time as the Finance Committee.

Library, Museum, and Laboratory.—Messrs. Betty, Bottle, Greenish, Hampson, Hanbury, Hills, Robbins, Sandford, and Schacht. To meet at eleven o'clock on the second Wednesday of the month, excepting in August and September.

House.—The same as the Library, Museum and Laboratory Committee, and to meet on the same days, or as occasion may require.

THE RECENT PROSECUTION OF THE LONDON AND PROVINCIAL SUPPLY ASSOCIATION.

The Council resolved itself into Committee to discuss with the assistance of the Solicitor, the case of the Society *v.* The London and Provincial Supply Association, Limited, in which judgment had been given against the Society by the Judge of the Bloomsbury County Court. The matter having been thoroughly discussed in Committee, the Council resumed, and the following resolution was passed unanimously—

> "That the Society's Solicitor be instructed to appeal against the decision of the Judge of the Bloomsbury County Court, in the case of the Society *v.* The London and Provincial Supply Association."

APPOINTMENT OF THE EDITOR AND SUB-EDITOR OF THE JOURNAL.

Dr. Paul was re-appointed Editor of the Society's Journal for the ensuing year, and Mr. F. Passmore, Sub-Editor.

LOCAL SECRETARIES.

The SECRETARY suggested that the appointment of Local Secretaries should be referred to the Library, Museum and Laboratory Committee, as was done last year, to revise the list and to submit it to the Council at the next meeting. This was agreed to.

INAUGURAL SESSIONAL ADDRESS.

It was resolved that Mr. Corder be invited to deliver the Address to the Students in October next.

Reports of Committees.

Messrs. Cracknell, Greenish, Robbins and Savage, having acted *ad interim* as a Finance Committee, presented certain accounts which they had examined and recommended for payment. Their report and recommendations were adopted.

Mr. Churchill brought forward the case of a person who had misunderstood the regulation as to the fee for the Preliminary examination.

On the suggestion of the President the matter was referred to the Library, Museum and Laboratory Committee.

Library, Museum, and Laboratory.

The Librarian had reported that the average attendance during the previous month had been, day, 26; evening, 12. Circulation of books, in town, 131; country, to 21 places, 33; carriage paid, 17*s*. 3½*d*. He had also reported the following donations to the library:—

'New Remedies, 1871-7.' From the Editors.

Leithead's 'The Cosmical Force,' 1851. From Mr. P. S. McIntyre.

'Calendar of King's College, London, 1877-8.' From the College.

'A Key to Organic Materia Medica.' Second edition. 1878. From Dr. Muter (author).

'A Manual of Vegetable Materia Medica.' Third edition, 1878. From Mr. G. S. V. Wills (author).

'Liebig's Letters on Modern Agriculture.' Edited by J. Blyth. 1839. From Mr. S. Betts.

The Committee recommended the purchase of the following books—

Wood and Bache's 'U. S. Dispensatory,' 14th edition (a second copy for reference); Livy; Virgil; Cicero.

The Curator had reported that the average attendance in the Museum during the previous month had been, day, 19; evening, 4. He also reported that the specimens of minerals offered to the Society by the Rev. W. Leay were not suited for the Museum, being mostly illustrative of geology rather than chemistry; that the specimens from Dr. Keik had been received and were satisfactory. He had also received a letter from Mr. W. R. Robinson, of California, suggesting that he might be able to grow medicinal plants such as were only found in tropical climates, and asking for information. The Curator had been directed to write in reply, stating that this was not a commercial society, but offering any information in his power.

The Committee recommended that the Sub-Editor be requested to compile a general index to the Journal for the last ten years. Professors Redwood and Bentley had reported favourably of their respective classes. Professor Attfield had been absent through illness. A deputation had been appointed to wait on Mr. Farrer with reference to the Weights and Measures Bill.

The President stated that Mr. Sandford, Dr. Redwood, and himself had waited on Mr. Farrer, at the Board of Trade, and during the interview, Dr. Acland, the President of the Medical Council, arrived from Oxford. The result was so far satisfactory that it was understood that a clause would be inserted exempting chemists and druggists from the operation of the Bill so far as regarded the use of the apothecaries' weight. The Government also consented to put in a schedule to the Bill, providing for the use of glass measures for drachms and minims; and as far as he knew the Bill was now satisfactory.

Mr. Sandford also gave an account of the result of the deputation. Mr. Stanhope, who had charge of the Bill, promised to add as an exception to one of the clauses, "drugs, when sold by retail, may be sold by apothecaries' weight." The deputation had also given Mr. Stanhope a table of the measures of the British Pharmacopœia, which he had introduced in a schedule, viz., fluid ounces, fluid drachms, and minims. The only remaining question was whether these measures could be stamped, and he thought there would be a difficulty in that, but if that could not be done, no one could be blamed for having them in his possession unstamped.

Mr. Bottle thought the measures might be stamped by affixing a small portion of soft metal to the side of the measure, as was done in Germany.

The President remarked that he for one should be delighted if the Government would undertake to inspect and verify these measures.

The report and recommendation of the Committee were then received and adopted.

House.

The report of this Committee, recommending the acceptance of Messrs. Parkinson's tender for certain repairs, etc., was also adopted.

The Council went into Committee to consider various matters which would have come before the Law and Parliamentary Committee had it been constituted, and a lengthy discussion took place on the Medical Bill, the result being that the President, with Messrs. Sandford and Hampson, were appointed to watch the progress of the Bill and to wait on the Duke of Richmond with regard to it if necessary.

A communication was read from the Chemists and Druggists' Trade Association, referring to the prosecution of the London and Provincial Supply Association, and other matters, but its consideration was deferred until next month, when

Mr. Fairlie undertook to bring forward a motion founded upon it.

A letter was read from Mr. S. U. Jones, enclosing a resolution passed at a meeting of the chemists of Leamington, requesting the Council to appeal against the recent decision in the case of the London and Provincial Supply Association, and also to take steps to have the defective sections of the Pharmacy Act amended. The letter was ordered to be entered on the minutes.

Admission of Reporters to the Council Meetings.

A letter from the editor of the *Chemist and Druggist* was also read, asking to be allowed to send a reporter to the Council meetings, and to attend them himself. The consideration of this also was deferred until next month, when

Mr. Hampson said he would move at the next meeting of the Council that the request be acceded to.

Admission of an Orphan to an Orphan Asylum.

The Secretary read a letter from Mr. Owen reporting the successful result of his efforts to obtain the election of a child into the Infant Orphan Asylum, and offering his services for similar work in future.

On the motion of the Vice-President, the thanks of the Council were voted to Mr. Owen, for the great trouble he had taken in this particular direction, and for his efforts generally on behalf of the work of the Benevolent Fund Committee.

Provincial Transactions.

CHEMISTS AND DRUGGISTS' TRADE ASSOCIATION OF GREAT BRITAIN.

A meeting of the executive committee was held at the office of the Association, 23, Burlington Chambers, New Street, Birmingham, on May 27, 1878, at 1 p.m., Mr. S. U. Jones (Leamington), president, in the chair.

After some business in connection with the appointment of committees had been transacted, the president announced the result in the case of the Apothecaries' Company *v.* Wiggins, as reported in this Journal last week.

The Solicitor said there was no attending or visiting outside the shop, no consulting-room, and no use of instruments proved in the case.

Mr. Shaw said that the prosecution in that case was quite at variance with the profession of the Apothecaries' Company, as they had stated it was not their intention to prosecute except in cases where there had been visiting.

In reply to a question, the Solicitor said he did not consider there was any point in the case on which the Association could go to the court above; there was no misdirection by the Judge; the verdict could not be disputed on the ground that it was against evidence, nor had the Judge excluded any evidence; indeed, although the admission of evidence of the practice of chemists and druggists prior to 1815 was objected to by the counsel for the plaintiffs, Mr. Justice Field admitted it, and the jury found that the defendant did not come within the exception provided by the 28th section of the Act. They had in the contest enforced the admission of the evidence of custom, but the jury had found that the cases treated by the defendant were not similar to those which chemists treated prior to 1815, inasmuch as they were not simple complaints. It would appear that chemists might treat any person for a simple complaint, but if the same turned out afterwards to be dangerous they ran a risk of being prosecuted, and a jury might find that the cases did not come within the scope of the 28th section.

Mr. Hampson said if funds permitted he thought it would be advisable to carry this case to a superior court. The present state of society compelled a chemist to prescribe, and it was utterly impossible for a chemist to discover the malignity of a complaint or to anticipate the character it would develop when applied to in its earliest stages. He heard the evidence given by the plaintiff's witnesses, and he considered all the cases which Mr. Wiggins had treated were cases that would have been treated by chemists generally, from necessity, in poor districts. The Association had, he thought, done well in defending Mr. Wiggins, and he would remark that there was no assumption of title in the case, and no guise of quackery; all the witnesses for the plaintiff went to Mr. Wiggins knowing him to be a chemist, and in that capacity they sought his advice and purchased his medicine.

After some further conversation it was resolved—"That the finding of the jury in the case of the Apothecaries' Company *v.* Wiggins being as follows—'We find the defendant acted as an apothecary in taking cases that were dangerous,' this Committee is of opinion that no further steps should be taken in this action, but reaffirms its decision to defend the case of the Apothecaries' Company *v.* Shepperley now pending."

Mr. Hampson said he was exceedingly sorry to announce that the case of the Pharmaceutical Society *v.* the London and Provincial Supply Association had been decided against the interests of the trade. It would be admitted that the question as to whether co-operative traders should be permitted to deal in scheduled poisons was of great importance to duly qualified chemists and druggists.

It was moved by the President, seconded by Mr. Barclay, supported by Mr. Holdsworth, and unanimously resolved—"That this Committee, viewing with the gravest apprehension the decision in the case of the Pharmaceutical Society *v.* the London and Provincial Supply Association, respectfully urges the Council of the Pharmaceutical Society to appeal to a superior court and endeavour to reverse this decision. Failing success, this Committee trusts steps will be taken by the Pharmaceutical Council to obtain an amendment of the Pharmacy Act, 1868, to protect the trade and the public from such practices, which are entirely opposed to the spirit and intention of that Act."

It was moved by Mr. Jervis, seconded by Mr. Cross, and unanimously resolved—"That the Secretary be instructed to communicate with the members of the general committee requesting them to take steps to convene meetings of the trade in their localities, with a view to request the Council of the Pharmaceutical Society to endeavour to reverse the decision in the case of the Pharmaceutical Society *v.* the London and Provincial Supply Association, and if found necessary, to amend the defective clauses in the Pharmacy Act."

Mr. Henry Glaisyer was reappointed Solicitor; Mr. W. F. Haydon, Secretary, and Professor Attfield, Analytical Referee to the Association, for the ensuing year.

The question of the best means of raising funds to prosecute the appeal in the case of the Apothecaries' Company *v.* Shepperley, in order to obtain a final decision on "Counter Practice," and to be in a position to take action in other cases as they may arise, was discussed, and a resolution was passed requesting the general committee to do its utmost to obtain an accession of strength in the shape of members, and also to aid in raising the Special Fund of £2000, required to enable the Executive of the Association to defend the interests of the trade.

It was also unanimously resolved to ask the Council of the Pharmaceutical Society to aid by a donation in prosecuting the appeal in the case of the Apothecaries' Company *v.* Shepperley.

Proceedings of Scientific Societies.

UNIVERSITY OF EDINBURGH CHEMICAL SOCIETY.

The ninth meeting of this Society was held on May 15, 1878; John Gibson Ph.D., F.R.S.E., in the chair.

A paper was read by W. Inglis Clark, D.Sc., on "The Gallate and Tannate of Iron," in which he reviewed the work of previous experimenters, and then detailed the results which he himself had obtained in a very extensive experimental investigation into the nature and properties of these substances, and the modifications they undergo when exposed to the action of acids, sugar and other bodies. A series of curves, embodying the results of these experiments, were exhibited, and showed clearly the interesting deductions which the author was able to make from them. It was further shown that by the action of aqueous gallic acid on metallic iron, a black compound was obtained, which when heated to 120° C. gave a percentage of iron, corresponding to the formula $FeC_7H_3O_5$, while before heating, it corresponded to the salt $FeC_7H_3O_5 2H_2O$. Two combustions, closely agreeing, gave a deficiency of carbon of about 4 per cent., thus opposing the view that the body under question was ferric gallate. The author continues his researches on the matter.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, May 16; Dr. Gladstone, President, in the chair.

After the confirmation of minutes, etc., the following certificates were read for the first time:—W. R. Crispel, and C. T. Macadam. The following gentlemen were elected Fellows of the Society:—J. W. Knights, J. H. Wilson. H. R. Smith, G. A. George, F. Slinger, W. Jago, H. W. Jones, A. E. Tucker, and B. Gregory.

The first paper was read by the Secretary—

On the Detection and Estimation of Free Mineral Acids in Various Commercial Products. By Peter Spence and A. Esilman. The method is based on the fact that peracetate of iron, even in dilute solutions, has a distinct yellow colour, not perceptibly altered by acetic acid, or solutions of persulphates, but instantly bleached by free sulphuric, hydrochloric and nitric acids. The solution is made by dissolving ten parts of iron alum, and eight parts of crystallized acetate of soda in one thousand parts of an 8 per cent. solution of acetic acid (25 per cent.). The method is especially suited for alum cake, salt cake, etc. 200 grains of the sample are triturated in a mortar with an 8 per cent. solution of acetic acid, and the peracetate solution added until the mixture has a decided yellow tint, showing that all the free acid has been neutralized. The liquid is then diluted to one hundred measures with the acetic acid water, and a portion filtered into a test tube. In another test tube as many measures of the peracetate solution as have been used for the above liquid are diluted up to about eighty measures with the acetic acid water; standard sulphuric acid is then run in until the colour of the liquid is the same as that of the one hundred measures in the first test tube. The quantity of acid used is the measure of the free acid in the cake.

The second paper was read by the Secretary; it was entitled—

The Action of Hypochlorites on Urea. By H. G. H. Fenton.—The author has found that when urea is acted upon by a hypochlorite in the cold in the presence of a caustic alkali only half the nitrogen is evolved. Thus the mean of eighteen experiments gave 18·22 per cent. nitrogen, theory requiring 37·3. Several samples of hypochlorite and various specimens of urea were tried, but all gave the same result. If an alkaline carbonate be used in place of a caustic alkali the whole of the nitrogen is evolved. Thus ·10303 grm. urea gave 35·3 c.c. nitrogen, when sodium carbonate was present, but only 19·02 in the presence of caustic soda; theory requiring 38·4. The author then made some experiments to find out what became of the remaining half of the nitrogen. He concluded that it was neither present as urea nor as an ammonia salt, but as a cyanate, the reaction being $2N_2H_4CO + 3NaClO + 2NaHO = 2NaCNO + N_2 + 3NaCl + 5H_2O$; further experiments completely confirmed this conclusion. The author states that this reaction may throw light on the constitution of urea, and affords an easy method of detecting and approximately estimating urea in the presence of ammonia salts. There is a mean loss of $2\frac{1}{2}$ of nitrogen in all hypochlorite reactions with urea and of about 8 per cent. in hypobromite reactions with ordinary apparatus.

Dr. Russell said that some experiments, which he made with Dr. West, confirmed in the main the author's results. He was surprised to hear the large suppression of nitrogen when the action took place in the cold. Hippuric acid when pure gives off no nitrogen; this fact has lately been confirmed by Dr. Gamgee. Ammonia salts give all but the theoretical yield. Oxamide is by no means completely decomposed.

Dr. Armstrong pointed out that the above results seemed to favour the constitutional formula of urea, suggested by Gamgee and Wanklyn $C\left\{\begin{matrix}NH_2\\NH\\OH\end{matrix}\right\}$. It must be recollected, on the other hand, that oxamide does not give off all its nitrogen.

Professor Foster said that he could confirm Dr. Russell's statement as regards oxamide, which gives off only about three-fourths of its total nitrogen. He called attention to the importance of using hypobromite solution quite freshly prepared.

The next paper was read by the Secretary—

On the Behaviour of Metallic Solutions with Filter Paper and on the Detection of Cadmium. By T. A. Bayley.—The author found by quantitative experiments that filter paper has the power of withdrawing silver salts from solution. Some experiments, by Mr. Weston, prove that the same action takes place between filter paper and mercury salts. The author then investigated the action which takes place when drops of metallic solutions are placed on filter paper. The extent to which the solutions spread being tested by the action of sulphuretted hydrogen. In some cases the solution seemed to concentrate itself in the middle of the spot, and in other cases in a ring round the edge of the spot. The degree of dilution, temperature, and the kind of paper used have an important influence on this phenomenon. Thus a strong solution of cupric sulphate distributes the copper all over the spot; dilute solutions, on the other hand, concentrate the metal in the centre. The salts of silver, lead, and the persalts of mercury when moderately concentrated give a wide water ring containing no metal, while the salts of copper, nickel, cobalt, and especially cadmium, must be much more dilute to present the same appearance. This property of cadmium to spread itself over the whole drop is so marked that it affords an elegant means of detecting it in the presence of metals whose sulphides are black. The diluted solution is dropped upon filter paper, and the spot allowed to extend as far as possible. On exposure to SH_2 a black patch is formed, surrounded by a vivid yellow ring. A solution containing much nickel, cobalt, or iron, in presence of copper, etc., may be examined successively with SH_2 and SAm_2. The presence of free acid increases the mobility of copper salts considerably.

The next paper was read by M. M. P. Muir; it was entitled—

On Essential Oil of Sage. By S. Siguira and M. M. P. Muir.—The authors refer to a former paper on the same subject (*Phil. Mag.*, Nov., 1877). The sample of oil with which the present experiments were made had been recently distilled at Leipzig, and was obtained from Messrs. Wright, Layman and Co. The oil consists mainly of two terpenes, an oxidized liquid, and a camphor. The properties of the terpenes and of salviol, as far as these have yet been examined, are as follows:—1st. Terpene boils 152°–156°, sp. gr. at 15° 0·8435. Refractive index for D line at 20° = 1·46071, hence sp. refractive energy = 0·546. Spec. rotatory power for soda flame = + 12·4. 2nd. Terpene boils 162°–167°; sp. gr. at 15° = 0·8653. Refractive index at 20° for D = 1·4658; refractive energy = 0·538; sp. rotatory power for soda flame + 13·4. Salviol boils 197°–203°; sp. gr. at 15° 0·934. Refractive index for D at 20° = 1·4623; refractive energy 0·495; specific rotatory power for soda flame = + 16·19. The terpene of lower boiling point yielded acetic and carbonic acids on oxidation. The higher terpene yielded oxalic acid on oxidation with nitric acid. Salviol yielded oxalic acid, carbonic acid, and hydrocyanic acid on oxidation with nitric acid; a small quantity of what was almost certainly camphor was also produced on distilling the product of the action of nitric acid on salviol with water. The action of bromine upon salviol resulted in the formation of an unstable brominated compound and of small traces of camphor. Phosphorous pentoxide converted salviol for the most part into cymene, but a small quantity of a terpene appeared also to be produced. A small quantity of absolutely pure sage oil has been examined by the authors. It consists for the most part of a terpene, boiling at 264°–270° ($C_{15}H_{24}$); sp. gr. at 0°, ·9198, at 12°, ·9137, at 24°, ·9072, and at 41°, ·8970. 100 mm. rotated the polarized ray + 3°·14. The terpene is of a dark emerald-green colour. The authors are continuing their investigation.

In the discussion which followed, Dr. Armstrong stated that he obtained, by the action of bichromate and sulphuric acid on the camphene from American oil, a substance which was dextro-rotatory and resembled ordinary camphor.

The next paper was read by the Secretary—

On the Action of Bromine upon Sulphur. By. J. B. Hannay.—On treating ordinary flowers of sulphur with bromine the author found that some of the sulphur remains undissolved. This insoluble residue was found to consist entirely of prismatic sulphur and amounted to 0·07 per cent. of the sulphur used. Carbon disulphide leaves about 0·12 per cent. undissolved. Roll sulphur when treated with bromine dissolves completely. The author examined with a spectroscope the vapour overlying a mixture containing SBr. He found that even at 0° the vapour gave the characteristic spectrum of bromine vapour as mapped by Roscoe and Thorpe. If more sulphur were dissolved, however, the spectrum disappeared. Thus, with a layer of liquid 0·5 metre thick, the absorption spectrum ceased to be visible in a liquid containing S_3Br at +42°, S_5Br_2 + 33, S_2Br + 25, S_4Br_3 + 13°, SBr + 3°. The author finds that the liquid in large mass begins to boil at 72° and rises without any pause, so that no evidence of the existence of a definite compound can be obtained by the boiling points. On mixing bromine and sulphur in the requisite amount a rise of temperature of 20° was observed. Some of this rise the author believes to be due to the change of state of the sulphur, because the amount of heat when plastic sulphur is used is distinctly less, only 12°. The author also estimated the sp. gr. of various compounds or mixtures: S_3Br 2·293, S_2Br 2·625, SBr 2·628, SBr_2 2·820, SBr_3 2·880, SBr_4 2·905, but without obtaining any evidence of the existence of SBr. An examination of the freezing points showed that the liquids became oily without solidifying, even at temperatures at which bromine is solid. The estimation of the vapour tension was also without avail. If a small quantity of arsenic be dissolved in the liquid SBr, and the mixture cooled to 18°, beautiful dark red crystals are obtained of the composition AsS_2Br_3, probably AsSBr SBr_2. The author therefore concludes that the action of any quantity of bromine on any quantity of sulphur is an action on the whole mass and not in multiple proportion; but that if at low temperatures the compound SBr_2 meets a body with which it can form a molecular combination it assumes the crystalline form in conjunction with such a body. The action of bromine upon sulphur increases in a regular manner up to SBr_2, totally ignoring SBr; above SBr_2 we may have another curve to SBr_4 and another fainter curve to SBr_8, but we have no evidence of the existence of S_2Br_2.

Mr. Muir thought that there was some evidence of the existence of SBr in his experiments, there seemed to be a stop in the distillation at 200°. This was confirmed by passing CO_2 through a mixture for some time and examining the residue.

Mr. Groves observed that the rise of temperature which occurred in mixing the two elements did not give the whole of the heat evolved, as some heat must be absorbed by the sulphur in passing from the solid to the liquid state.

The next paper was—

On the Determination of High Boiling Points. By T. Carnelly and W. C. Williams.—The determination of the melting points of a large number of metallic salts by Carnelly enabled the authors, in cases where only approximate results were required, to ascertain the boiling point of a substance by observing whether or not certain salts fuse when exposed to the vapour of the substance in question when boiling. The metallic salts are contained in capillary tubes: thus determined—S boils 446—451° (Regnault gives 447°); Anthracene 339—359°; HgI_2 339—359°; AsI_3 394—414°; $BiCl_3$ 427—439°; SbI_3 414—427°; $ZnBr_2$ 695—699°; $ZnCl_2$ 708—719°; TlCl 719—731°; TlI 806—814°; Cd 772°.

The last paper was—

On High Melting Points. Part IV. By T. Carnelly, D.Sc. (Lond.).—The author has carefully investigated and got rid of two sources of error which existed previously in his method (*Chem. Soc. Journ.*, 489, 1876). He now uses a much finer platinum wire to suspend the crucible and has redetermined the value of his calorimeter with very great care. In the present paper he gives the melting points of over one hundred substances, and promises in a short time some interesting theoretical results which he has deduced from the above observations, the most important being that in simple binary compounds if one of the elements remains the same, then the melting point is a periodic function of the atomic weight of the other. The author also hopes to be able to indicate a method by which many unknown melting points may be predicted.

After the thanks of the meeting had been given to the authors for the respective papers the Society adjourned to June 6.

On Thursday, May 30, Dr. Gladstone, F.R.S., P.C.S., gave a *soirée* to the fellows of the Chemical Society at Burlington House. Amongst the numerous objects of interest were the following:—A magnificent collection of immediate principles from the brain, exhibited by Dr. Thudichum, who also demonstrated the absorption spectrum of a new colouring matter, ovocruentin, derived from eggshells, the bands being identical with those of cruentin obtained from the blood. In the library were specimens of artificial corundum and emerald, made by Feil and Frémy; a large Cape diamond, exhibited by Professor Tennant; a collection of precious stones from Hunt and Roskell, including a fine pink topaz, cats' eyes, and a large crystal of garnet; some interesting apparatus of Faraday, amongst which was his rheostat; a collection of alkaloids from opium, aconites and veratrum, by Dr. Wright; a splendid case by W. H. Perkin, illustrating the colouring matters from aniline, anthracene, etc.; a specimen of artificial alizarin and preparations of natural and artificial salicylic acids, the latter of which the exhibitors, Messrs. Hopkin and Williams, have succeeded in obtaining in crystals exactly resembling those of the natural product; minerals containing liquid carbonic acid were shown by W. N. Hartley, who also demonstrated the effect of heat on the liquid enclosed in the cavities; crystals from Owens College, including a large, almost perfect octahedron of chrome alum. Various interesting products, etc., were exhibited by Professor Odling, Professor Frankland, Dr. Russell, Dr. Armstrong, Dr. Witt, Dr. Schorlemmer, Dr. Hugo Müller and M. M. P. Muir. In the room adjoining the lecture room, were some candles which had been acted upon by sea water for 173 years, a large collection of meteoric stones, an interesting series of photographs of invisible fluorescent bodies, etc., exhibited by the President; a splendid photograph of the solar spectrum, shown by Professor Rutherford; the spectrum of bismuth was shown by Messrs. Browning; dichroic crystals of nickel and cobalt salts by J. M. Thomson; photographs illustrating the recent researches in solar chemistry, by J. N. Lockyer; an enormous cut cairngorm, weighing fifty-one ounces, an opal cameo, and various minerals, by Bryce Wright, etc. In the lecture and preparation rooms were the microphone, exhibited by Professor Hughes, which attracted considerable interest. Mr. W. De La Rue showed some phosphorizing tubes, which after a momentary exposure to some burning magnesium flashed back all the colours of the spectrum; Bryne's pneumatic battery and the copper zinc couple were shown in action. Messrs. Murray and Heath exhibited under the microscope some pretty crystals of gold, silver, etc. Sir Joseph Whitworth and Dr. Senier showed specimens of steel; in the same room, Dr. Guthrie exhibited the formation of cryshydrates; many other objects of interest were exhibited, but it would be impossible to enumerate all. On the whole, the *soirée* was most successful, and although the attendance was numerous the arrangements were so good that at no time were the rooms inconveniently crowded.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held on Thursday May 9, at 17, Bloomsbury Square, Mr. W. R. Atkins in the chair, when a paper was read by Mr. G. F. Gutheridge on "Water, its Properties, Impurities and Contamination."

The author first referred to the discovery of the composition of water, the merits of which he assigned to Cavendish, and then proceeded to the consideration of the first part of his paper, viz., the properties of water These are for the most part familiar to all; the deep bluish-green colour of pure water may be seen in some of the Swiss and Norwegian lakes and also, as shown by Dr. Frankland, in distilled water. Rain-water, the purest natural water we have, contains principally gases as nitrogen, oxygen, etc., dissolved it; river water is less pure than rain water and is liable to be polluted with sewage and organic contaminations; these contaminations are, however, in some measure removed by the flows of the river. Sea water owes its peculiarities to the salts, principally sulphate and chloride of sodium and magnesium, held in solution.

The impurities were divided into (1) natural impurities and (2) artificial contaminations. Under the heading natural impurities were considered organic and inorganic suspended matter and mineral impurities in solution; under artificial contaminations were classed (1) metallic impurities, such as lead, and organic contamination proceeding from sewage, etc. The methods for detecting the presence and estimating the amount of such contaminations were here considered. For this purpose the estimation of the chlorine sometimes affords valuable negative results, but the presence of a considerable amount of chlorine is not in itself sufficient to condemn a water for drinking purposes. The principal test is the estimation of the organic matter present. The methods chiefly employed for this purpose are the "albuminoid ammonia" process by which the organic matter is measured by the amount of ammonia yielded by its decomposition; and Frankland's combustion process which consists in the determination of the organic carbon and nitrogen in the solid residue.

The paper was followed by an interesting discussion and a vote of thanks having been unanimously awarded to the author, the meeting adjourned.

Parliamentary and Law Proceedings.

Poisoning by Santonin.

On Friday, May 24, Dr. Diplock concluded an inquiry at the Mitre, Golborne Road, Upper Westbourne Park, respecting the death of Ella Jeannie Edworthy, five years of age. The evidence showed that on Saturday evening, the 4th ult., the mother, a widow, gave the deceased a powder which she had received from a neighbour, and which had been obtained from a "self supporting dispensary" in Edgware Road, Paddington. The deceased died half an hour after taking the powder. Dr. Kilner, of Ladbroke Grove Road, Notting Hill, made an analysis, and the result showed that death ensued from santonin, six grains of which were found in the stomach. Mr. Beresford Pickers, of 399, Edgware Road, stated that he prescribed the powder. He told Mrs. Weeks it was to be given in two doses. Mrs. Weeks, upon being recalled, denied that she received any such instructions. The jury, after a long deliberation, returned a verdict of death from misadventure, and censured Mr. Pickers for not giving explicit and written directions with the powder.—*Kensington News.*

Poisonous Violet Powder.

At the Epping Petty Sessions, on Friday, May 31, Henry George King, wholesale chemist, again appeared o answer the charge of having caused the death of Eliza Sears and others, and further with having unlawfully and fraudulently sold violet powder containing large quantities of arsenic, to the danger of the public health. Mr. Poland prosecuted, and the prisoner was undefended. Evidence was adduced to show that many children had died after the employment of the violet powder upon their bodies. The defendant said, as soon as he heard of the facts, he tried to stop the sale of the powder, which was being sold all over London. Mr. Poland admitted that the defendant had done his best to restrict the sale of this powder, and hoped that he would give the names of his customers, so that the powder might be traced. The defendant said he wished to do so. He hoped the newspapers would publish the facts, that people might be warned. Dr. Dupré of Westminster Hospital stated the percentage of arsenic, ranging from fifteen to fifty-one, found by him in the packets submitted to him for analysis. He had examined two packets taken from the defendant's premises, and both were free from arsenic. He also received a packet of 'terra alba,' which was free from sulphate of lime and contained no trace whatever of arsenic. Mr. Barnard Thomas, of the Treasury, had handed him a packet of violet powder, one of those seized by Serjeant Roots in Cambridge Road on Monday, and, on testing it, he found it to contain a great percentage of poison. Any one accustomed to deal in starch and terra alba could easily distinguish them from arsenic, which was a dull, not white, powder. Terra alba was more white and opaque. Powders mixed with 30 per cent. of arsenic ought easily to be recognized by persons dealing in such things; in fact, they could distinguish the difference with the eye and with the hand, as there was a great difference in the weight. The symptoms described by the witnesses were similar to those which followed the application of arsenic to the skin. He knew that there were cases recorded in which death had ensued from outward application of arsenic. Fly-papers and insect powders, which were amongst the list of articles sold by the defendant, might contain arsenic. The case was again adjourned.

On Friday, at the time of going to press the hearing of this case was being continued, evidence being given as to injury resulting from the use of the powder.

Serious Charge against a Chemist and Druggist.

At the Bristol Police Court, on Friday, May 31, John Cook, a "foreman chemist," of Castle Street, and John Newman, turner, were charged with administering to Veronica Sidey "certain poisonous and obnoxious things."

Veronica Sidey said that some time since she spoke to Newman with whom she had been keeping company respecting her condition, and he gave her 2*s*. 6*d*. to go to a doctor. She went and saw the defendant, who told her he would give her some stuff that would soon cure her. He gave her some stuff and some pills. She took the stuff and kept the pills. She had three bottles of physic in one week, and they made her bad. She gave up the pills and several bottles to Mr. Stoddart. Newman gave her 2*s*. 6*d*. to see Cook. She went to him last March and he examined her, and said she ought to have taken the stuff Newman gave her more regularly. He then gave her a bottle of stuff that was so nasty that she did not take it. On the Thursday she received another bottle from Newman, and he told her not to take it till she had a room in which she could be attended to.

The case was at this point adjourned till Tuesday, when Mr. Stoddart deposed that he had examined the contents of the bottles, and one of them contained a drachm and a half of oil of savin and an ounce and a quarter of ergot.

Eventually Cook was discharged and Newman was committed for trial.

Mysterious Death of a Young Woman at Yorktown.

An inquest has been held at the Duke of York Hotel, Yorktown, before Mr. G. Hull, coroner for West Surrey, touching the death of Rose Annie Boddy, who was discovered dead in her bed.

Dr. A. B. Fry deposed that he was called to the house, and there found the body of the deceased on the bed quite dead. There were no external marks of violence. He locked up the house and sent for the police. He made a *post mortem* examination forty-eight hours after, and found the body well nourished. On opening the chest and abdomen, he found no signs of peritonitis. The lungs and heart were perfectly healthy.

The liver was healthy, and the kidneys congested, but otherwise healthy. The uterus was enlarged, and on being removed and opened contained a healthy male fœtus of about seven months. The uterus was perfectly healthy. The brain substance he found was perfectly healthy, and the ventricles also. In the cavity of the brain there was an effusion, and there was some considerable congestion of the vessels. The stomach presented strong indications of congestion. He found some pills by the deceased's bedside, which he thought contained strong doses of cayenne pepper. He could not find sufficient to enable him to account for death. The brain effusion was not sufficient to cause death, and he thought the cause of death might be found in the stomach.

Dr. Stevenson, public analyst, of Guy's Hospital, London, stated that he had examined some pills which had been given to him. The pills were coated with silver, and each contained from three to four grains of capsicum, which was a powerful stimulant, and used medicinally in doses of half a grain for various female complaints. It was unlikely that three or four grains would produce serious results. He was not aware that capsicum ever procured abortion. He was of opinion that the cause of death was effusion on the brain. Any irritant, such as capsicum, is often given with the view of procuring abortion.

John Pierce Joyce, chemist, residing at Windsor, said: The label on the box (produced) is mine. I cannot say that I know anything respecting the box of pills produced. I see that my own writing is on the box, but have no recollection of selling them; but if it was within a reasonable date I would recollect it. I should consider that they are our ordinary dinner pills. I do not know who bought them. I knew the deceased by sight, but am not aware that she bought the pills. My ordinary dinner pills would not contain about three or four grains of capsicum; we only give a quarter grain of capsicum to each pill.

Dr. Stevenson: I have made up a pill containing four grains of capsicum.

By the Jury: I did come down here the day after the deceased died. I was coming here, and was stopped by a woman, who said to me, "Are you going to call on Rose Boddy, and she died in a fit." I have not been in the habit of giving her pills. I have occasionally visited her, but have not come to Yorktown specially to do so. I have known her for a number of years, and she lived in my service some time ago. I never made any appointment to meet her in London.

The Coroner said that what the jury had to consider was the cause of death, and not any outside circumstances, which had no bearing on that subject. The medical evidence was to the effect that death had been caused by effusion on the brain, and they would have to return a verdict to that effect.

The jury returned a verdict in accordance with the medical evidence.—*Sheldrake's Aldershot and Sandhurst Military Gazette.*

POISONING BY VERMIN KILLER.—CENSURE OF A CHEMIST AND DRUGGIST.

An inquest was held at the Bradford Town Hall, on Tuesday, June 4, before Mr. J. G. Hutchinson, borough coroner, on the body of a female named Helen Crabtree, who died from taking a quantity of poison. The deceased was thirty-four years of age, and a few weeks since one of her children was taken ill with the scarlet fever, and was removed to the Fever Hospital, where it died. The deceased had always disapproved of the child being taken from her house, and after its death she expressed great grief at her loss, and at times was very depressed in spirits.

It appeared that on the previous Friday the deceased had sent one of her daughters, an intelligent child, eight years of age, who gave evidence at the inquest, to Mr Swaine, chemist and druggist, Bolton Road, for two packets of vermin powder. The child was served with the poison by John Arthur Swaine, son of the proprietor, and according to her statement no questions were asked of her, and no entry was made in any book whilst she was present, by the lad selling the poison. The poison was given into the hands of an elder sister, who in her turn delivered it over to the deceased. On Monday, about five o'clock, the deceased walked into the surgery of Mr. March, Tennyson Place, and informed him that she had taken some poison. In reply to questions from Mr. March, the deceased stated that she had taken two packets of "rat poison," which she had obtained from Mr. Swaine. She had taken the poison in some gin and sarsaparilla. Mr. March at once administered an emetic, after which the deceased moaned, and made a great deal of noise as if in pain, exclaiming several times, "What must I do?" Immediately after having administered the emetic, Mr. March went for his stomach-pump, and whilst he was gone, the deceased fell off the chair upon which she was sitting, in convulsions. Mr. March called in the assistance of two police-constables, and after having three other convulsive fits, the deceased expired. Afterwards a letter, in the deceased's handwriting, was found, saying, "If I die, I shall die of vermin killer."

The lad Swaine admitted having sold the poison to the child without making an entry, and stated that it was not the practice in his father's establishment to do so.

The Coroner summed up, alluding to the circumstances under which the poison had been sold, and remarked that it was within the province of the jury to give an expression of opinion thereon.

The jury returned a verdict of "Suicide whilst of unsound mind," and at the same time expressed a strong opinion with regard to the manner in which the poison had been sold to the deceased's child. At their request Mr. Swaine was called into the room, and severely censured by the Coroner, who pointed out the provisions of the Act of Parliament with reference to the sale of poisons.—*Bradford Observer.*

Dispensing Memoranda.

[105]. SYR. FERRI SUPERPHOSPH. CO.—Some remarks in "The Month" of last week appear to call for notice, lest passing unchallenged, they may appear to have received a general assent. If "those who write prescriptions can scarcely be expected to keep strict pace with science," still less does it appear reasonable to suppose the writer of a prescription of yesterday to have had in his mind a paper published twenty-seven years ago, not widely known then, and now practically forgotten.

A less fanciful interpreter would ascribe the super in syr. ferri superphosph. co. to a slip of the pen, or even to ignorance on the part of the prescriber, and if unable to consult him would supply Parrish's Syrup without much hesitation. With regard to Hoffmann's Anodyne the writer appears to have assumed the very point at issue when he asserts that it is a compound spirit. Cogent arguments will be required to turn the scale against the weight of authority produced by Mr. Squire.

Lombard Street, E.C. C. E. S.

[106]. "SODÆ CARB."—I am not quite of your opinion that sodæ carb. in a prescription should be looked upon as bicarb. unless specially pointed out. Were I ordering a mixture for dyspepsia I should not of course think of the subcarbonate; but I have known many physicians very particular about the sodas ordered by them, and a great deal must depend upon the other ingredients.

Suppose a pill of ext. aloes aq. and sodæ carb. ordered, I think it would be entirely out of place to suppose the bicarbonate was meant.

I have compounded such pills, and had no difficulty with the sodæ carb. siccat. But they will not keep.

In expectorant mixtures the subcarbonate was always meant by the physicians so prescribing.

Northallerton. HENRY BROWN.

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[107]. HOFFMAN'S ANODYNE.—Allow me to correct an error made by your printer. The Italian formula is properly stated in my letter "ether 1, rectified spirit 2." I may also mention that the U. S. Pharmacopœia did not copy, as some suppose, from the British in attaching Hoffman's Anodyne to the formula sp. ether co., for in none of the original Pharmacopœias issued by the several Colleges of England, Scotland or Ireland will you find Hoffman's Anodyne mentioned.

P. SQUIRE.

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[107]. HOFFMAN'S ANODYNE.—Having been away in the country, I have only just seen Mr. Squire's letter in the Journal of May 25.

For *old* names and *old* forms, one should go back to *old* books.

Dr. Anthony Todd Thomson (the first lecturer to the Society on Materia Medica), in his London Dispensatory of 1837, in speaking of Spt. Æth. Sulph. *Comp.*, P. L., says, "this is intended as a substitute for the Anodyne Liquor of Hoffman," and gives as its Italian synonym "Anodino Minerale dell' Hoffman;" and Professor Redwood (the first lecturer to the Society on Practical Pharmacy), in his Gray's Supplement, 1847, gives as Hoffman's Anodyne Liquor the Spt. Æth. Sulph. *Comp.* of the Lond. Phar., 1836.

With these authorities before us, I cannot think Mr. Squire justified in applying the name to the simple Spt. Ætheris.

J. M. HUCKLEBRIDGE.

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[107]. HOFFMAN'S ANODYNE.—I am glad to observe in your notes for "The Month" that so much space is devoted to explanations and criticisms of correspondents' opinions, and I hope the "Memoranda" will steadily increase.

I must still dissent from Mr. P. Squire in regard to the calling of spiritus ætheris Hoffman's Anodyne. It matters not if all continental pharmacopœias call a mixture of rectified spirit and ether by the name, Hoffman's Anodyne; such mixture cannot surely be properly so called so long as there is the omission of the ethereal oil, which is the *sine quâ non* of the "anodyne," so to speak.

I must, then, emphatically deny to simple spirit of ether the appellation of Hoffman's anodyne liquor, and I am sorry to see Mr. Squire should call it by a name which for more than a hundred years has been connected with a spirit containing ethereal oil. We have no right to follow continental pharmacopœias, and Mr. Squire, as a great pioneer and authority in pharmacy, should endeavour to point out discrepancies, and call a spade by its proper name.

I pointed out in the Journal of May 11 that from time to time the proportion of ethereal oil, as given by authorities, varied slightly; but this does not affect the question.

We are not concerned with the question as to whether or not spiritus ætheris was to take the place of the old-fashioned anodyne, but with the fact that for more than a century an anodyne spirit, having ethereal oil as a constituent, was known in England by the name of Hoffman's liquor.

HENRY BROWN.

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[108]. The prescription cannot be dispensed clear as written, but by the addition of a little borax (about two grains to the ounce) a clear solution is the result.

F. W. B.

[110]. "Apprentice" will find no difficulty in obtaining a satisfactory result by first rubbing the yolk of egg in a mortar with the acetic acid, diluted with the rose-water, and then adding the turpentine and ess. lemon; turn it into a twelve-ounce bottle and shake well together for a few minutes.

This liniment is said to resemble that of the famous Mr. St. John Long, and, although it is easily made as required, my experience is that it improves in appearance by keeping, as in a few days it assumes a creamy consistence and becomes quite white. It is a great favourite with many medical men, and is an excellent application.

FELIX STEVENS.

51, *Judd Street, W.C.*

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[110]. I had the same prescription to dispense in 1853 (excepting that there were only ʒx Ess. Limonis) and have dispensed it many times since. I find no difficulty in making a perfect and permanent emulsion quickly. Stir the Vitell. Ovi with 1 oz. Aq. Rosæ till well mixed, pour into a bottle and add gradually the Ol. Tereb. and Ess. Limonis and thoroughly emulsify* by soaking after such addition; then add the remainder of the Aq. Rosæ in the same way, and lastly the Acid. Acet.

C. TUCKER.

Bridport.

P.S.—This was ordered for a young lady, supposed to be consumptive, to be applied to the chest on flannels I am happy to say she is alive now, and has two or three bottles every year, besides recommending it to her friends.

C. T.

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[111]. Here it is evident that the oleoresin is intended (copaiba, B. P.). The formula for Syr. Gummi may be found in Beasley's 'Pocket Formulary.'

FELIX STEVENS.

51, *Judd Street, W.C.*

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[112]. Will any reader furnish information as to the best mode of making the following into a plastic pill mass?—

℞ Ferri Iodidi . . . . ʒj.
Potassii Iodidi . . . . ℈ij.
Ft. pil. lx.

A. P. S.

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[113]. What would be the correct strength to send the pills in the following prescription, which I saw only last week?—

℞ Pil. Rhei Co. . . . . . . xij.
vel ij. p.r.n.j.

G. H. B.

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[114]. Could one of your correspondents inform me how to dispense the following, forming a perfectly transparent mixture?—

℞ Ferri Sulph. . . . . gr iij
Acid. Hydrocyan. (Sch.) . . . . ♏ viij
Sp. Æther. Nitr. . . . . ʒi ss
Inf. Cascarillæ . . . . ℥viij
A wineglassful night and morning.

I find that it deposits a flocculent precipitate.

R. M.

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[115]. RAISINS, B.P.—With which kind of raisins is it correct to prepare the tinctures of senna and cardamoms? The Pharmacopœia directs "raisins freed from their seeds," and "the ripe fruit of *Vinis vinifera* imported from Spain." In some establishments muscatels are used, in others sultanas. The muscatels are the finest raisins imported and have seeds; the sultanas are without seeds, but I am under the impression that they never had any, consequently if this be so it would hardly

* No such word in the dictionary, but there ought to be for convenience.

be correct to describe them as "freed from their seeds;" both are the fruit of *Vinis vinifera*, and imported from Spain. I am in favour of using muscatels.

P. B.

Belfast.

Notes and Queries.

[116]. What is the dose of Ol. Santal. Flav., and should it be mixed with Liq. Potassæ or mucilage?

H. GOODWIN.

[503]. ROSE COLOUR.—I wish to colour a compound a nice rose colour. The colour requires to be added whilst the material is very hot, and my difficulty is that the heat appears to burn the colour out of any colouring substances which I have tried. Will any one kindly advise me what to use, with as full directions as possible? The substance to be coloured in character very much resembles fancy soap or beeswax.

RAINBOW.

[504]. MIST. AMMONIACI CONC.—Four drachms of this preparation added to one pint of distilled water will form Mistura Ammoniaci, B.P. Can any one oblige me with the formula for making the above, or making Mist. Ammoniaci Concent. 1 to 7?

S. L.

Belfast.

[505]. GLUCOSE IN HONEY.—What would be the readiest method for detecting the presence of Glucose Syrup in Honey? I have some "California" Honey (from a respectable firm), which from its appearance of non-solidifying, I suspect is adulterated with this article.

JNO. W. WRIGHT.

[560]. CHRYSOPHANIC ACID STAINS. — Can any reader inform me of a method for removing from linen the stains caused by Chrysophanic Acid Ointment?

J. H. B.

[507]. SPONGE POWDER.—Can any reader inform me what is generally sold for cleaning sponge, under the name of Sponge Powder?

PESTLE.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE VOTE FOR ADMITTING WOMEN AS MEMBERS OF THE SOCIETY.

Sir,—After the extraordinary statement of Mr. Sandford, I shall not be surprised to hear that it was Mr. Vizer, and not myself, who moved the resolution in favour of the admission of women to membership of the Society.

Mr. Sandford has written: "Because from my position at the table, when Mr. Wade and Mr. Vizer delivered the result of their counting, I was enabled to hear distinctly that fifty-nine was given by the former, and fifty-seven by the latter."

As Mr. Vizer did not utter his numbers aloud, but handed them to the President on paper, in order that I, who stood between Mr. Sandford and himself, should not hear how many he had counted, it is impossible that Mr. Sandford could have heard the numbers direct from Mr. Vizer, although he might those which I proclaimed aloud, as others did who were standing near, and who have since written to me corroborating my statement.

Mr. Vizer believed his numbers to be fifty-nine. I never had a doubt as to my own being fifty-seven, and the President, who received the numbers from us, was of the same opinion. Why therefore we should all be under a delusion, and Mr. Sandford alone infallible, is what I think "no fellow will be able to understand."

JOHN WADE.

174, *Warwick Street, Pimlico, S.W.*
May 28, 1878.

Sir,—Considering the small number that attended the last Annual Meeting and voted on the admission of women question; considering also the practical outcome, that there were present six of one and half a dozen of the other; it would not be worth while to remark on the curious muddle that was made of the voting, were it not desirable to prevent a like occurrence in the future.

I cannot for the life of me make out from the published account what actually did take place, and Mr. Wade's letter seems but to make confusion worse confounded. The cause of the muddle was I apprehend an imperfect acquaintance with the rules governing the use of the "Previous Question" as it is termed. The question itself is "that this question be now put," and the object of its proposer, seconder, and supporters being to defeat the main question, they must vote against against the motion—properly speaking it is not an amendment. If the noes have it, the main question is not put and the matter ends. If the yeas have it the main question is at once put without amendment.

If Mr. Vizer counted the votes against his amendment, as Mr. Wade says he did, he did quite right, but whether those whose votes he took understood what they were about is a question impossible for me to decide; nor is it worth the trouble to attempt it, seeing that the meeting, as I have said before, was about balanced *pro* and *con*.

I will take this opportunity of complaining of the cruel kindness of some of the speakers in favour of admission, who would act towards the ladies as the ladies not unfrequently do towards children, give them what they ask for, though they know well it will do them harm.

A true friend of the sex should endeavour to repress a hankering after notoriety, and the tendency to adopt avocations incompatible with the performance of home duties—duties which, unless performed by women, cannot be performed at all with advantage to the rising generation.

Women compelled to work for a living may well wait for fresh openings for their exertions when advertisements such as the following cease to appear:—

"Wanted a man cook," "Ladies' mantles and jackets warranted tailor-made," "Wanted so many laundry-men," etc., etc. While for the higher ranks, it should be their ambition to render unnecessary the every-day announcement in connection with Ladies' Schools, "Experienced Masters teach such and such subjects."

THOMAS B. GROVES.

Weymouth, May 22, 1878.

Sir,—The equality of the divisions at the annual meeting I think all will admit was highly unsatisfactory, leaving the Council in exactly the same position of uncertainty as to the real wishes of their constituents upon a most important question.

I most thoroughly sympathize with the feeling expressed by some gentlemen that the Council is not a mere body of delegates, bound to carry out a certain line of policy under the trammels of a trade union, but upon a question so essentially affecting the very constitution of the Society by which they are elected, I consider they acted in a strictly constitutional spirit, and in full recognition of the representative position they hold, by referring the question to the decision of the annual meeting of members. Had the suffrages of the electors been sought by a distinct avowal, on the part of candidates, of their view upon this question, I would say leave the matter in the hands of your representatives and abide the consequence, but such not having been the terms of election I venture to suggest that a poll of the entire Society should be taken by the issuing of a circular to each member, putting the question in the most simple words possible, without note or comment, requiring an equally simple reply—yes or no—the expense would be but trifling, the result decisive.

EDWIN B. VIZER.

Belgrave House, Cliftonville, Brighton. May 20, 1878.

THE SELBY BREAD CASE.

Sir,—As the chemist employed by Messrs. Croysdale and Son for defending them against the unfounded charge of adulterating their flour with alum, I wish to be allowed to correct some inaccuracies which have crept into the reports of the press, and notably the one you have copied from the *Leeds Mercury*. The charge against my clients was adulteration of flour with alum, and this charge was based on the certificate of the analyst, Mr. Allen, of Sheffield, which stated that the two samples of flour were adulterated with different proportions of alum. This positive statement of Mr. Allen's led the magistrates and the reporters astray, when they deduced from his evidence that alum *per se* was separated from the flour, and thus the reporters in copying the Somerset House certificates give alum instead of alumina, and the magistrates, or one of them, said that to them alumina appeared another word for alum. Now, our contention is that alumina is present in all commercial samples of flour, being derived either from the flour itself or from clay, dust, or other accidental impurities present, more or less, in all wheat; but that alum, being a manfuactured salt of alumina, can only be present in flour as the result of deliberate adulteration, and that therefore the whole question turns upon the fact of whether the alumina present was in an insoluble condition, as it would be if derived from clay, or from the millstones, or in a soluble condition, as when derived from alum.

The quantity of alumina is not disputed; but when Mr. Allen was asked how he separated and detected the alum, he answered that he did not separate the alum as such, because neither he nor any other chemist could do so, but that he estimated the alumina as phosphate of alumina, and deduced from its weight the quantity of alum present, having first tried if the alumina was present as a soluble salt or not. But previous to testing he gave the samples to his maid-servant to bake into bread, and then tested the bread. The question may be asked, why not test the flour instead of the bread, for baking does not increase the solubility of alum? We must leave Mr. Allen to answer, for I cannot.

As to the opinions of the court on the 13th instant, I state, without fear of contradiction, that the magistates on Mr. Allen's evidence were prepared to convict Messrs. Croysdale and Sons, and they appeared annoyed with the report they had received from Somerset House, because the Government analysts said the two samples contained alumina equivalent to so much alum per four pound of flour, and that they could not affirm alum was present. One of them went a step further, and stated in open court that the analysts in question could not be chemists, or they would not have given such a certificate; but chemists will ask, "What other could they give?"

On the first day of the trial, April 6, Mr. Allen, while upon his oath, said to the magistrates that in his opinion the Somerset House certificates were in accordance with those he had given. This extraordinary and inexplicable statement misled the magistrates, and entailed heavy expenses on my clients. It was evident to every disinterested person that these certificates did not confirm Mr. Allen's analysis, but he insisted that they did, and hence my clients were driven to incur the expense and annoyance of another day's trial.

We were fortunately able to subpœna Mr. Bannister, one of the Somerset House chemists, to attend on the 13th, and after his clear and convincing evidence was given, the magistrates unanimously dismissed the case, thus proving that in their opinion their own analyst was wrong and the Government chemists right. If the case had proceeded we should have been able to prove from direct evidence that the flour was pure, and that the Messrs. Croysdale had been persecuted through the blindness of the analyst. The question left to be considered is, "Can the analyst be made responsible for the expenses and damages?" We hope he can.

M. D. PENNEY, F.C.S.

ELECTION OF COUNCIL.

Sir,—I think the present a most suitable time to question the method of electing the Council.

It is gratifying to observe the change which is gradually coming over the minds of those who desire to become members of Council, by the embodiment of their views, in the form of addresses, upon the debatable questions of the day.

The yearly election of suitable representatives is the most important duty we have to perform towards the Society; consequently, it becomes necessary to elect those representing our own peculiar views of questions; but in how few instances is there any possibility of our faithfully so doing.

Take the present as an instance: out of a list of twenty-one candidates we only have an address from three; the qualifications of some of these gentlemen are well known to us, others, from their dubious utterances at the Council table, leave us in uncertainty of their sentiments, while others again are only dawning upon the horizon of pharmaceutical politics.

How, then, is it possible for us in the present *régime* to select men who can possibly be representative of our interests?

I do not wonder at the indifference of chemists generally to this election; and, when it is said that above 60 per cent. never fill up their voting papers, so far from being surprising it is, in fact, in the circumstances, the only reasonable course open to the majority of chemists, because it is more consistent to withhold exercising electoral rights, when such can only be done mechanically. If it were according to the nature of things that the first fourteen on the list were necessarily the most competent men, then automatism would be synonymous with reason, but until this is the case we, who are not omniscient, must not be held as unreasonable if we do not vote, when we do not know what might be the result of our temerity.

For the sake of argument, even supposing each candidate to give us, in the shape of an address or otherwise, the benefit of his sentiments, and be elected by the majority of the members, I should hesitate to call this Council a true representative of our interests. For instance, under the present system, supposing the North of Scotland ventures to put forward a candidate to represent its interests, he would stand but little chance of success; not because he might not be sufficiently supported by those whose suffrages he is seeking, but because these, however manfully they poll, will be relatively disproportionate to their more fortunate brethren of the metropolis.

Therefore I think the present system of electing the Council at fault, and am of opinion that the system as advocated by Mr. D. Frazer of Glasgow a much superior one, and meriting what it has not yet received—the serious consideration of all interested in the future well-being of pharmacy. This is the delegate system of territorial representation, the country being divided into districts, and those districts electing from their own number one capable of representing the interests and claims of the body. With this system, instead of the elector being restricted in his knowledge of the candidate to general particulars it will be possible for him to thoroughly prove the merits and demerits of his man.

DAVID S. ANDERSON.

West High Street, Forfar,
May 15, 1878.

J. Cass.—Yes; the upper part of the stem is often comparatively free from spots.

J. H. Stanford.—The crystals are probably potassium chloride. This you can easily ascertain for yourself.

"*Lanark.*"—(1) Lime tree flowers (*Tilia europæa*); (2) Hops.

"*Nemo.*"—We cannot undertake to pronounce upon the legal question submitted to us. Consult a solicitor.

J. W. Dyas.—We cannot say.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Brown, Facey, Challice, Balls, Hughes, Thomson, Burgoyne and Co., Froger-Bourdon, Barnes, Boothby, Summers, Sumner, Davey, Glover and Co., Schmidt, Readman, Corry, Johnson and Nicholson, Boweller and Bickerdike, Ellinor, Symes, Bashford, Mawson and Swan, Best, Shaw, Thomas and Dower, Storer, Simpson, Hemingway, Rolls, Schweizer and Co., Propert, Wilkinson, Hayward and Clark, Markham, Gerrard, Gidney, Clark and Co., Macteas, Langbeck, Jackson, Stuart, Spence, Wyndham, Rimmington, Abraham, Bromhead, Tichborne, Dunmore, Rowland and Sons, Hafford, Macfarlan, Barberon and Co., Smith, Loret, Rigaut and Dusart, Bush and Co., Scuftleben, Meynet, Southall and Barclay, Fourmier, Pellier and Maze-Launay, Annie, M. P. S., Justitia, Country Apprentice, Fides, J.L.

DIALYSED IRON AS AN ANTIDOTE IN POISONING BY ARSENIOUS ACID.

BY W. GIBBONS.

It has already been proposed that the solution of dialysed iron should be used as an antidote in cases of poisoning by arsenious acid, but up to this time no one has given any proof as to the value of these suggestions.* The supposition was founded on the knowledge that freshly prepared peroxide of iron was the usual remedy used, as it formed with the arsenious acid held in solution in the stomach an insoluble substance, having the formula $Fe_3 2AsO_4$. This fact was pointed out by Dr. Bunsen about forty years ago.

On hearing this I was induced to make the following experiments:—

I heated ¼ litre of water in a flask to the temperature of the human body (98·4° F.) and mixed with that 7·1 c.c. (f ʒij about) of an acid solution containing 1 grain of As_2O_3 in the quantity taken (Liq. Arsen. Hydrochlor. B.P.), to that I added 14·2 c.c. of the solution of dialysed iron (strength 2 gr. in f ʒj) and kept this mixture at a constant temperature, *i.e.* 98·4° F., for about one hour without obtaining any result. Now as the usual method of administering moist ferric oxide is, first to give a dose of a solution of some precipitant such as bicarbonate of soda, or a mixture of magnesia and water, followed by a large dose of the solution of perchloride of iron, I determined to follow up that method. I took all as before but in addition I used a small quantity of a solution of bicarbonate of soda. I then found that the arsenical solution was acted upon and the desired result obtained. In the first case I allowed the mixture to remain together for about one minute only, and on collecting the precipitated oxide of iron and washing, I found that already it had absorbed some of the arsenious acid. A second mixture I kept together for one hour at the temperature already mentioned. I then found that about 40 per cent. of the acid was taken up. This I consider proves beyond doubt, that a dose sufficiently large of dialysed iron solution, preceded by a dose of a solution of bicarbonate of soda or of magnesia (to neutralize the acidity of the stomach, and using an excess) is an antidote in poisoning by arsenious acid.

According to Dr. Maclagan at least twelve parts of moist peroxide of iron prepared with ammonia are required for one of arsenious acid, from which we can conclude that three volumes (at least) of the dialysed iron solution (2 gr. in f ʒj) are required for one volume of either of the arsenical solutions of the B.P. But as yet I can give no proof as to the correctness of this statement.

Pereira says that, "moist ferric oxide is only an antidote where solutions of arsenious acid have been used, and not when the solid acid has been taken." But as the arsenic must enter into solution with the liquid contained in the stomach, it stands to reason that the antidote is as good in one case as in the other, especially as the arsenic has no action in the solid form.

In conclusion, I must add that the advantages over the ordinary method of administering the antidote are as follows:—

Firstly, the solution of perchloride of iron has to be largely diluted in order to make it palatable, whereas dialysed iron does not require much water, as it can almost be taken as it is, and moreover it can be given in large doses with greater safety than ferric chloride solution.

Secondly, the amount of magnesia or alkaline carbonate in the case of dialysed iron is but small, as it has only to overcome the acidity of the stomach before acting upon the antidote, but with ferric chloride solution it is much larger, for in addition to the acidity spoken of, the alkali has to overcome the acid of the ferric chloride solution used.

And lastly, as few chemists keep moist ferric oxide ready prepared, and even if they did it would have become inactive by keeping, whilst nearly all have dialysed iron, this supplies the most rapid mode, and also the best way or administering the antidote for this most painful poison.

* Some experiments in this direction by Mr. Mattison, which the author appears to have overlooked, are recorded in the present volume, before, p. 569.—Ed. Ph. J.

NOTES ON INDIAN DRUGS.

BY W. DYMOCK.

(*Continued from page* 747.)

Bauhinia variegata, *Linn.*: Leguminosæ. *The bark.*—Kachnár (Hind.); Kánchan (Bomb.); Kanchan (Beng.).

History, Uses, etc.—There are two varieties of this Bauhinia. The flowers of the one are purple or deep rose coloured, and of the other, white, yellow and green; both are noticed in the 'Bhavaprakása' under the names of kovidára and kanchanára, and are said to have similar properties, the bark being described as alterative, tonic, astringent, and useful in scrofula, skin diseases, and ulcers. Chakradatta recommends the bark of the first variety in scrofulous enlargements of the cervical glands, and directs it to be given in emulsion with rice-water and ginger. Sarangadhara also recommends it for a similar purpose, and prescribes it in combination with guggulu (gum-resin of *Boswellia serrata*), myrobalans, and a number of aromatics. Under the name, kachnár, the author of the 'Makhzan' describes the bark as astringent, attenuant, and tonic. He says it is used to check diarrhœa, to remove intestinal worms, and prevent decomposition of the blood and humours; on this account it is useful in leprosy and scrofula. A gargle made from the bark with the addition of akákiá (extract of acacia pods) and pomegranate flowers is mentioned as a remedy in salivation and sore throat, and a decoction of the buds in cough, bleeding piles, hæmaturia and menorrhagia.

Description.—The bark is grey, tolerably smooth, compact; fracture granular, reddish-brown; the external surface is covered thickly with little elliptic warts of a darker colour than the rest of the bark; the internal surface is white and woody. The taste is feebly astringent. Microscopic examination discovers nothing characteristic.

Zizyphus, Sp. Rhamneæ. *The dried fruit.*—Unnab (Arab.).

History, Uses, etc.—This is the jujube of Arabic and Persian works on materia medica, and is not produced in India, but is largely imported in a dry state both from the Persian Gulf and China. Meer Mahomed Hussain describes it as the fruit of a well-known tree of nearly the same size as the kunar (*Zizyphus Jujuba?*), and olive; but having leaves a little thicker and longer than those of the kunar, with one side downy. The bark, wood, and fruit of the tree are red. The best fruit comes from

Jurjan, China, and Nipal. It should be sweet and moderately astringent, about the size of a dried date, and with a small stone. He gives a long account of the medicinal virtues of the jujube, from which we gather that he regards it as a suppurative, expectorant, and purifier of the blood; its uses would appear to be in many respects similar to those of dried prunes with us. The bark of the tree is used to clean wounds and sores, the gum in certain affections of the eyes, and the leaves when chewed are said to destroy the power of the tongue to appreciate the taste of disagreeable medicines. In Western India we have several cultivated varieties of *Z. Jujuba* which afford edible fruit, as well as a wild variety. None of these are considered medicinal, but their bark is powerfully astringent, and a kind of lac, known as bhooree lák, is found upon the branches. The fruit of the wild kind is dried and powdered. This powder is called in Hindu, bér-choonee.

According to Ainslie the root is prescribed in decoction by the Vytians in conjunction with sundry warm seeds, as a drink in certain cases of fever. The white pear-shaped fruit of *Z. rugosa* (Toorun, Bomb.) is eaten by the natives. The fruit of *Z. xylopyra* (Gootee, Bomb.), is used by shoemakers for blackening leather and for making blacking.

Description.—The dried fruit which comes from China, is from 1 to $1\frac{1}{2}$ in. long, and $\frac{3}{4}$ in. broad; skin red, much shrivelled; pulp adherent to the stone, spongy, sweet and yellow; stone $\frac{6}{10}$ in. long, very hard and rugose; apex sharp pointed, shell very thick; seed oblong, flat, of a chestnut colour, $\frac{4}{10}$ in. long, and $\frac{2}{10}$ broad. The fruit which comes from the Persian Gulf is somewhat smaller.

Commerce.—The Bombay market is supplied from China and the Persian Gulf ports. The Chinese fruit is preferred as it is larger and sweeter. Value, Chinese Rs. 8 per S. M. of $37\frac{1}{2}$ lbs.; Arabian Rs. 4—5.

CARDIOSPERMUM HALICACABUM, *Linn.*: SAPINDACEÆ. *The root and leaves. Vernacular*: LATAPHATKARI, NAYAPHATKI (Beng.); MOODA COTTAN (Tam.); KANPHOOTEE (Bomb.).

History, Uses, etc.—Sanskrit writers mention this plant under the name of jyautishmati, and describe the root as emetic, laxative, stomachic and rubefacient; they prescribe it in rheumatism, nervous diseases, piles, etc. The leaves are used in amenorrhœa. The following prescription is given in the Bhavaprakasha:—"Take the leaves of *C. Halicacabum*, impure carbonate of potash (sarjiká), *Acorus calamus* root, root bark of *Terminalia tomentosa*, of each equal parts and reduce to a paste with milk. About a drachm of this compound may be taken daily for three days in amenorrhœa." Rheede says that on the Malabar coast the leaves are administered in pulmonic complaints. According to Ainslie the root is considered aperient, and is given in decoction to the extent of half a tea-cupful twice daily. It would appear that in rheumatism the Hindus administer the leaves internally, rubbed up with castor oil, and also apply a paste made with them externally; a similar external application is used to reduce swellings and tumours of various kinds.

Description.—Annual, climbing; stem, petioles, and leaves nearly glabrous; leaves biternate; leaflets stalked, oblong, much acuminated, coarsely cut and serrated; flowers small, white or pink; fruit a membranous bladdery capsule, three-celled, three-valved; seeds globose, black, with a two-lobed white aril at the base; roots white and fibrous, with a rather disagreeable odour and an acrid nauseous and somewhat bitter taste.

SAPINDUS TRIFOLIATUS, *Linn.*: SAPINDACEÆ. *The Vernacular*: RITHA (Hind. and Bomb.); PENNAN KOTTAI (Tam.).

History, Uses, etc.—The soapnut, in Sanskrit phenila, has probably been in use among the Hindus from the earliest ages as a detergent. Both Hindus and Mahometans use it medicinally. The latter on their first arrival in the country gave it the name of bunduk or finduk-i-hindee (Indian filbert). The following account of its use is extracted from the Makhzan-ul-adwiya. The pulp of the fruit is at first sweetish to the taste, afterwards very bitter; it is hot and dry. Tonic and alexipharmic. A four-grain dose in wine and sherbet cures colic. One miskal rubbed in water until it soaps, and then strained, may be given to people who have been bitten by venemous reptiles and to those suffering from diarrhœa or cholera. Three or four grains may be given by the nose in all kinds of fits producing insensibility. Fumigations with it are useful in hysteria and melancholy. Externally it may be applied, made into a plaster with vinegar, to the bites of reptiles and to scrofulous swellings. The root is said to be useful as an expectorant. Pessaries made of the kernel of the seed are used to stimulate the uterus in childbirth and amenorrhœa.

One miskal of the pulp with one eighth of a miskal of scammony acts as a good brisk purgative. Ainslie mentions its use by the Vytians as an expectorant in asthma. In Bombay it is given successfully as an anthelmintic in four-grain doses.

Description.—Berries three, united, when ripe soft, and of a yellowish green colour; singly they are of the size of a cherry, somewhat uniform, with a heart-shaped scar on the attached side. When dry they are of the colour of a raisin; skin shrivelled, pulp translucent, absent on the attached side. The inner shell enclosing the seed is thin, tough and translucent like parchment, except at the scar, where it is woody. Seed the same shape as the fruit, black, smooth except at the hilum, where it is tomentose, size of a large pea; on the upper part of the dorsum of the seed are two shallow diverging furrows. The testa is double, the outer very thick and hard, the inner membranaceous. Kernel yellowish-green, oily; cotyledons unequal, thick, firm, and fleshy, spirally incurvate. Radicle inferior, linear, lodged at the base of the seed, pointing to the lower and inner angle. The pulp of the fruit smells like compound extract of colocynth; its taste is sweet at first, afterwards very bitter.

SEMECARPUS ANACARDIUM, *Linn.*: TEREBINTHACEÆ. *The fruit. Vernacular*: BHELA, BHILAWA (Hind.); BIBA (Bomb.); SHÉN-KOTTAI, SHÉRÁN-KOTTAI (Tam).

History, Uses, etc.—The marking nut, in Sanskrit Bhallataka and Arushkara, is regarded by the Hindus as acrid, heating, stimulant, digestive, nervine and escharotic, and is used in dyspepsia, piles, skin diseases and nervous debility. It is prepared for internal use by being boiled with cowdung and afterwards washed with cold water. The nut is also used to produce the appearance of a bruise in support of criminal charges preferred through enmity, and the juice is sometimes applied to the body out of revenge, the victim having first been made insensible by the administration of narcotics. In Sanskrit medicinal works, a section is often devoted to the treatment of ulcerations thus produced. When given internally the juice of the pericarp is always mixed with oil or melted butter. The Arabic name for the nut is Hab-ul-Kalb, an allusion to its heart-shaped form. Mahometan writers order the juice to be always mixed with oil, butter, or some oily seed, when used for internal administration. They consider it to be hot and dry, useful in all kinds of skin diseases, palsy, epilepsy and other affections of the nervous system, the dose being from ¼ to ½ a dirhem. Externally they apply it to cold swellings. When too large a quantity has been taken oily and mucilaginous remedies should be prescribed; 2 dirhems is considered a poisonous dose. Some persons are much more readily affected by the drug than others. Garcia d'Orta remarks that the poisonous properties of the marking nut have been much exaggerated by Serapion, and goes on to say that in Goa it is administered internally in asthma after having been steeped in butter-milk, and is also given as a vermifuge; and, moreover, says he, we (the Portuguese) salt the young green fruit and use them like olives. Ainslie gives the following account of its use in Southern India. "The Hindus give the juice in scrofulous, venereal and leprous affections in very small doses. An oil is also prepared with the nut by boiling, which is used externally in rheumatism and sprains; it is of a very stimulating nature. Undiluted it acts as a blister. The Telingoes have the following prescription:—Juice of marking nut and garlic of each one ounce, juice of fresh tamarind leaves, cocoa nut oil, and sugar, of each two ounces; mix and boil for a few minutes. Dose one table-spoonful twice daily in syphilis, aches, sprains, etc. Mixed with a little quicklime and water the juice is used all over India for marking linen and is far more durable than the marking inks of Europe. In the Pharmacopœia of India, the exaggerated notions of its injurious properties are revived."

Description.—The marking nut is well described by the Arabs as resembling the heart of an animal, the torus representing the auricles and the fruit the ventricles. In the dry commercial article the torus is seldom present, and the fruit is of the size and shape of a broad bean, of a black colour, and quite hard and dry externally; but upon breaking the outer skin with a knife the central cellular portion of the pericarp will be found full of a black oily acrid juice; inside the pericarp is a thin shell, conformed to it, and containing a large flat kernel, which has no acrid properties.

Commerce.—Marking nuts come from various parts of the country.

Value.—¾–1 R. per Surat maund of 37½ lbs.

MELILOTUS, Sp.?: LEGUMINOSÆ. *The fruit, Vernacular*: IKLEEL-UL-MALIK (Arab. and Bomb.)

History, Uses, etc.—The small crescent-shaped pods which are imported into Bombay from the Persian Gulf under this name are not those of *M. officinalis*, but are considered by Arabian writers to be the melilotus of Dioscorides. The author of the 'Makhzan-ul-Adwiya' gives maleelotus as the Greek name, and geeah-i-kaisar as the Persian. He goes on to say that there are two kinds of melilot, both plants are much alike, bu the fruit of one is crescent-shaped, with small roundish seeds, something like fenugreek, while the fruit of the other is much smaller, and only slightly curved; both have an odour like fenugreek. The best fruit for medicinal purposes is hard, yellowish-white, and aromatic, with yellow seeds. The Mahometans, following the Greeks, hold melilot in high esteem as a remedy in a great variety of disorders. It is considered to be suppurative and slightly astringent, and is much used as a poultice to dispel tumours and cold swellings. The diseases in which it is administered internally are of a widely different nature, and far too numerous for recapitulation here. For an account of them we must refer the reader to the 'Makhzan,' article "Ikleel-ul Malik." The Arabian drug appears to have the same properties as *M. officinalis*, at any rate it has the same peculiar coumarin odour. *Melilotus leucantha*, Koch., and *M. parviflora*, Desf., grow in the Bombay Presidency; the first species has the delicate odour of the European melilot. In the 'Makhzan' an Indian variety of melilot is mentioned which has very small fruit; it is called parang.

Description.—Small sickle-shaped greyish-yellow pods, with a beak slightly curved outwards; distance from base to apex half an inch; length of pod when straightened out about one inch. It is grooved on both sides, and divided by a central partition into two cells, each of which contains a single row of small greyish-yellow rhomboidal seeds, deeply notched on one side, and seen under the microscope to be marked with numerous black spots. The other kind, with very small slightly curved pods, mentioned by Mahometan writers, is not found in the shops; it is probably the *M. officinalis*, or *leucantha*, now *alba*.

(*To be continued*).

HYDROBROMIC ACID.*

BY DE WITT C. WADE.

I have read with much interest the paper on hydrobromic acid, presented by Dr. Squibb at the last annual meeting of the Medical Society of the State of New York, and published in the February number of *New Remedies*.† Some of the positions taken by the author are at variance with my views, and I therefore take the liberty of discussing them, with your permission, in your journal.

It is now generally admitted that the object of administering a bromine salt is to obtain the effects of bromine upon the system. Now, doubtless, to obtain this effect the salt must be decomposed by an acid, and the gastric acids are known to be capable, to a certain extent, of accomplishing this object. What is this extent? Its indefiniteness results from the variable amount of free acid present in the stomach at the time of the administration of the salt. If acids are entirely absent, the bromide will be absorbed and eliminated, and no effect of bromine will be obtained, for the effect always depends upon the amount of hydrobromic acid produced by the decomposition of the salt, and it is probable that generally a part of the salt becomes absorbed before being broken up, and the effect of the bromine of such part lost. This is the reason that hydrobromic acid was proposed as a medicine, thus avoiding the unreliability of the stomach as a laboratory. It is found, clinically as well as in theory, that a smaller amount of bromine in the form of hydrobromic acid, will produce the specific effects of this halogen upon the system, than when administered chemically united to a base. Hence, it is not necessary or proper that the relative amount of bromine in hydrobromic acid and in

* From *New Remedies*, April, 1878.

† See before, p. 727.

bromide of potassium should be considered in determining what the dose of the acid should be.

Dr. Squibb recommends a complicated method of preparing hydrobromic acid, in no particular like the one now almost universally used. The object of his method, which he minutely describes, is the production of a purer and stronger acid, to be accepted as a standard. I will first consider the question of purity. There can be no doubt that the method he proposes will produce a chemically pure acid, or nearly so, while the simple plan of decomposing bromide of potassium with tartaric acid will give us an article containing in solution bitartrate of potassium, and possibly free tartaric acid and bromide of potassium. If the proper proportion of the salt and acid is used, they can only remain as impurities, by failure of complete chemical union of the base and acid. It will be found that the amount of each unappropriated will be quite minute, and consequently entirely harmless and unobjectionable. The solubility of bitartrate of potassium (cream of tartar) is given in the U. S. 'Dispensatory' at 1 part to 180 of water. Therefore, half a fluid drachm of hydrobromic acid contains about one-sixth of a grain of this impurity, which, I am sure, is sufficiently free from serious contamination to be regarded as unobjectionable. But supposing one-half as much tartaric acid should be used, as provided for in the formula, resulting in the formation of the soluble tartrate, instead of the nearly insoluble bitartrate of potassium; the impurity could only be considered as entirely harmless, and the value of the acid, as a medicine, in no way detracted from. Indeed, when we administer bromide of potassium, the stomach is permitted to produce the hydrobromic acid, and retain all of the by-products we now seek to eliminate. Hydrobromic acid prepared by the tartaric acid method is a clear, strongly acid fluid, that clinically or by any other test, save chemical analysis, presents no suspicion of containing a trace of the harmless impurities I have described. That it is laudable to urge the use of pure drugs I admit, but taking into consideration that isolation of active principles is the exception in medicinal compounds, and that in this case the patient takes less of impurities than he does with his daily bread, and remembering that the tartaric acid formula can be accurately followed by any novice and without chemical appliances, while druggists can rarely be found in this country who have sufficient experience in chemical manipulations to correctly follow the method given by Dr. Squibb, even if in possession of the required apparatus, embracing also, as it does, the question of cost, I think I am safe in asserting that the tartaric acid plan will continue to be preferred by both physician and pharmacist.

Dr. Squibb advises that a standard for the strength of hydrobromic acid be adopted, one-half that of bromide of potassium; that is, containing by weight one-half as much bromine, and also, that it always be dispensed by weight. That this drug should have a standard strength is certainly desirable, but to me it is questionable if the proposal of still another formula, three or four times the strength of those in use, will accomplish the object. I can hear of only two formulas for the production of the acid, by means of bromide of potassium, tartaric acid, and water; one ascribed to Dr. Fothergill, and one furnished by myself. To explain the disparity between these formulas, will necessitate the rehearsal of a part of their history. In 1874, I determined to prescribe hydrobromic acid for the purpose of obtaining the effects of bromine. instead of using bromide of potassium. I prepared the acid by decomposing bromide of potassium with tartaric acid. I am not aware that previous to that time any person had ever prescribed this acid, or had prepared it by this formula. I therefore believe I have a right to claim to be the originator of the formula, as well as the idea of using the acid as a therapeutical agent. After having prescribed it sixty times, I wrote a paper, in the autumn of 1874, for the *Peninsular Journal of Medicine* (Detroit), which appeared in the February number, 1875, in which I gave my reasons for suggesting the acid as a medicine, the result of my clinical experience with it, and a theoretical formula, specifying that each fluid drachm of the finished preparation shall represent 10 grains of bromine. Undoubtedly this was the first that ever appeared in print, in regard to the use of hydrobromic acid as a medicine. Dr. Fothergill states, in the first paper he wrote on the subject, that he transcribed my paper for a British medical journal, and gave my formula to his hospital pharmacist with instruction to prepare the acid. He then gives his experience with it for twelve months, and finally the working formula. He does not allude to the fact that this formula provides for less than 10 grains of bromine to the fluid drachm. In it the bromide of potassium and tartaric acid are not given in the correct proportion for chemical combination. I therefore conclude that the working formula was furnished by the pharmacist, and that Dr. Fothergill did not critically examine it, but published it under the apprehension that it was correct and in conformity to my theoretical formula. Dr. Fothergill does not claim any originality in connection with the subject. I deem it unfortunate that the error occurred, as it has caused considerable inquiry as to what formula to adopt.

My standard of ten grains of bromine to the fluid drachm of the finished preparation is entirely an arbitrary one, but I have thought best not to advise a change of strength, because it is found that of this strength half a fluid drachm is a proper average dose for an adult, and is a convenient one in making combinations with other medicines, or with syrup. Of this strength it requires considerable dilution before it is swallowed. If it should be made more concentrated, it would only result in lessening the dose, so that, when properly diluted on swallowing, the strength would be unchanged, and the same amount of bromine would be taken in either case.

I can, therefore, see no reason why the tartaric acid formula should be discarded, nor do I believe it will. The Michigan Pharmaceutical Society has adopted what it is pleased to denomiate as my formula, and published it in the transactions for 1877. It is not improbable that the next edition of U. S. 'Pharmacopœia' will contain a formula for the preparation of hydrobromic acid, and the desirable strength be determined for Americans. If other than ten grains of bromine to the fluid drachm be adopted, the change in the formula will only be in reference to the amount of water to use.

My objection to the dispensing of hydrobromic acid by weight is, that fluid medicines are always administered by measure, and it is therefore more convenient for the prescriber to order by measure.

The following working formula provides for ten grains of bromine in each fluid drachm of the finished preparation. In my opinion it should be denominated dilute hydrobromic acid, in conformity to the rule applying to the other weaker mineral acids.

Bromide of Potassium	120 grains.
Crystallized Tartaric Acid . . .	153 „
Water	1 fluid ounce.

or

Bromide of Potassium . . .	11 avoir. ounces.
Crystallized Tartaric Acid . .	14 „ „
Water	40 fluid ounces.

Dissolve the bromide and then the acid in the water, and keep at a low temperature till precipitation ceases, and decant.

There are many physicians who not only use this acid almost to the exclusion of the bromine salts, but for many purposes where the latter would not produce similar results. I will close this paper with the statement that I have prescribed between one and two *barrels* of hydrobromic acid.

VOLATILE OIL OF THE LEAVES OF MYRCIA ACRIS.*

BY PROFESSOR GEORGE F. H. MARKOE.

During the past eight months I have been engaged in the distillation of bayberry leaf oil, or, as it is usually called, bay oil or oil of bay leaves.

About 7000 pounds of the leaves were consigned to me, packed in bales that varied in weight from 150 to 375 pounds. The quality of the leaves varied very much, some being rich in oil, others yielded a very small per cent., not enough to pay for the trouble and expense of their distillation. Some of the bales were filled with large full grown leaves, others with the leaves on the small branches or twigs on which they grew.

One lot of two bales, about 500 pounds, was received in a green condition, just as the twigs had been pulled off from the trees, without drying. The leaves, being tough and evergreen, had not been at all injured.

The sample which is being passed among the members will serve to give an idea of the appearance of the leaves in a dry condition. They have no odour until they are crushed, when the strong fragrant odour characteristic of the familiar bay rum will be at once recognized. The leaves have an agreeable, pungent, spicy taste, and may be used as a flavour for soups, gravies, etc. The dried unripe fruit or berries form a substitute for pimento or allspice; very few people would be able to tell the difference between the two, either by their appearance or by the taste.

The leaves received by me were mostly from the Island of St. Thomas. The apparatus used in distilling the oil from the leaves was a 200-gallon copper still, heated by steam, so arranged that either wet or dry steam could be used at pleasure.

From 200 to 300 pounds of leaves were used at each running of the still, and to work off this quantity required from eight to twelve hours, during which time from eighty to one hundred gallons of distillate would be obtained. The oil comes over in two portions. First a portion lighter than water, that comes over very rapidly, and then the heavy oil, that comes over very slowly and does not easily separate from the water, with which it forms a milky emulsion.

I will give the notes made of one of the runs with 200 pounds of the leaves. The distillate was collected in quantities of two and a half gallons, and the oil carefully separated from each portion, and then I took the specific gravity of each of the portions of the light and of the heavy oils:—

Light Oil.

No. 1.	Specific gravity	·870
No. 2.	„ „	·930
No. 3.	„ „	·946
No. 4.	„ „	·964
No. 5.	„ „	·982
No. 6.	„ „	·990

The total yield of the light oil coming over in the first fifteen gallons of distillate, from which it promptly separated, leaving the water quite clear. The distillation was then continued to obtain the heavy oil until sixty-five gallons more of distillate were obtained. The oil was divided into three portions, and then the specific gravity of each portion was taken.

Heavy Oil.

No. 1.	Specific gravity	1·023
No. 1.	„ „	1·035
No. 3.	„ „	1·037

The oil when first distilled is colourless, but by exposure to the air quickly acquires a yellowish tint, which deepens into a rich brown tint, and if the exposure is continued the oil becomes quite dark in colour just as does the oil of clove or the oil of pimento. The odour of the freshly distilled oil is rank, but in the course of from three to six months it becomes mellow and ripens into the agreeable fragrance so much liked in the best specimens of bay rum.

Wishing to study the light and the heavy bay oils, I made the following experiment, with a view of getting the two oils in a pure condition by a careful fractional distillation of the light and the heavy oils as obtained directly from the leaves:—

1. Twenty pounds of the crude heavy oil, which had been exposed to the air until it had acquired a deep brown colour, was put into a thirty-gallon jacketed steam still, together with twenty gallons of water. The distillation was begun very slowly, and the distillate collected in portions of two and a half gallons. The first and second portions contained about four pounds of light oil, then the water came over of a milk-white colour, and on being allowed to stand the heavy oil subsided to the bottom of the bottles.

The distillation was very tedious, requiring twenty hours to get all the oil over. When the oil had separated from the water the latter was returned to the still. Seventy-five gallons of distillate were required to complete the rectification. The twenty-six portions of heavy oil were divided into thirteen portions by mixing Nos. 1 and 2 together, 3 and 4, and so on through the series. The specific gravity of each portion was then taken, and is given in the following table, at 85° F., the temperature of the laboratory:—

Fractional Distillation of Heavy Bay Oil. Specific Gravity, taken at 85° F.

1.	Specific gravity	1·025
2.	„ „	1·030
3.	„ „	1·036
4.	„ „	1·040
5.	„ „	1·045
6.	„ „	1·045
7.	„ „	1·047
8.	„ „	1·048
9.	„ „	1·048
10.	„ „	1·048
11.	„ „	1·048
12.	„ „	1·042
13.	„ „	1·035

The first eight portions were nearly colourless. No. 8 had a light straw colour, 9 and 10 light brown, and 13 almost black.

Nos. 8, 9, 10, and 11, being all of the same specific gravity, were mixed together and taken to represent the pure heavy oil of bay. It had the following properties:—Colourless when first distilled, quickly acquiring a brown colour by exposure to the air; the odour recalls that of clove; the taste hot, pungent, aromatic, very like that of oil of cloves; it reddens the skin and produces a hot tingling sensation in the part to which it may be applied; the effect does not, however, last long. The oil is soluble in the 95 per cent. alcohol of the market in all proportions, also in ether and petroleum benzin. It is soluble in the officinal solutions of caustic potassa, forming after a short time a mass of crystals. I have not had time to push my investigations any further, but feel quite sure that the heavy oil of bay is identical with the eugenic acid common to the oil of clove and pimento.

The specific gravity was taken with much care, using a 500-gram flask in making the determinations at 77° F. and at 60° F.

Specific gravity of heavy oil of bay at 77° F.	1·052
„ „ „ „ „ 60° F.	1·055

I next took ten pounds of light oil of bay, as obtained from the leaves, having a sp. gr. of ·945, and slowly redistilled it, reserving the first portion for examination.

This was a clear, limpid, colourless liquid, having a sp. gr. of ·829 at 77° F., and of ·8356 at 60° F., perfectly

* From the Transactions of the American Pharmaceutical Association.

soluble in strong alcohol, ether, benzin, and chloroform. It is, I presume, the characteristic terpene of bay oil, but I have not had time to examine it fully.

When the residue in the still was examined about four ounces of a dark coloured very thick body was obtained from the sides and bottom of the still. This I think is the resin that is formed by the oxidation of the eugenic acid of the oil of bay, and is the peculiar colouring-matter of the oil. It is carried over, to some extent, during the last part of the distillation.

I offer the above notes simply as preliminary to more extensive study of the subject, which I hope to be able to make, and the results of which I will gladly present to this Association at some future time.

OPIUM AND ITS ANTIDOTE.*

BY CHARLES RICHET.

The alkaloids found in opium do not all affect in the same way the organic functions. Thus, narcotine possesses very little or no soporific power: two grams of it can be injected without perceptible effect, while a centigramme of morphine is quite sufficient to produce therapeutic and physiological results. Thebaine does not cause sleep, and in animals produces convulsions like those caused by strychnine, while morphine in the same dose produces deep comatose sleep. Another curious thing about these opium alkaloids is, that they do not act alike on man and animals, as has been demonstrated by Claude Bernard. Man is especially sensitive to the action of morphine, while thebaine is almost without effect upon his nervous system; animals, on the other hand, feel the effects of morphine only when it is given in large doses, while thebaine is for them a violent poison. So, too, with belladonna, and atropine, its active principle; they are a deadly poison for man, but almost without effect on rabbits: the dose of atropine that would suffice to kill ten men would hardly be enough to kill one rabbit. The difference is not so great with respect to morphine, yet morphine specially affects man; hence in this article we will consider only this one opium alkaloid.

It is not yet positively decided whether opium produces anæmia or whether it produces congestion of the brain; indeed, we know little more than that it sets one asleep. This sleep, however, is in some respects different from ordinary sleep. From thirty to sixty minutes after taking opium one feels a slight excitation; there is a general feeling of buoyancy and contentment, soon followed by drowsiness and a state of reverie rather than of dreaming. There is a pleasurable feeling of *abandon*, and an agreeable sense of torpor creeps over the whole frame; the thoughts are like the ever shifting scenes of a phantasmagoria, on which we passively gaze, without will or effort to alter the series. Still, so long as the intoxication is not deep, such effort is possible. One feels that he is falling asleep, and that if he would but bestir himself he might overcome his drowsiness. But little by little the legs grow heavy, the arms fall to the sides almost powerless, and the weighted eyelids refuse to remain open. A dreamy, rambling sort of thinking still goes on, and there is as yet no sleep; we are still conscious of the world around. We indistinctly hear the tic-tac of the clock and the rumble of passing vehicles, but it is as though, so to speak, another person were listening, and not we. The active, conscious *Me* exists no more, and another personality seems to have taken its place. Gradually everything becomes more and more indistinct, our thoughts are enveloped in a haze, we feel ourselves detached from matter, detached from our bodies, and transformed into thought, which flits about, so to speak, becoming more and more brilliant, but at the same time more and more confused. Then the outer world disappears, and there remains only an inner world, sometimes full of tumult and delirium, and producing feverish excitement, or, as is more frequently the case, calm and quiet, and full of delightful repose. This intoxication is purely physical, and far superior to the intoxication produced by alcohol or hasheesh, for, though hasheesh gives one a few hours of insanity, opium gives sleep, and with this boon there is nothing that can compare. One must have suffered from insomnia in order to appreciate the value of opium. It brings sleep, and it banishes pain.

It is one of the most powerful agents we possess for modifying the sensibility, but whether it does this by acting upon the sensor nerves or on the brain we know not with certainty. Even where it does not procure sleep, it has the singular power of calming the excitability of the nerves, and of subduing that morbid state of the sensibility called by physicians hyperæsthesia. It has been observed that when it reduces hyperæsthesia it does not cause sleep, all its force seemingly being spent in combating pain.

In China there is the same popular demand for opium that exists in Europe for alcohol and tobacco. The use of opium does not date very far back, and it is probably the only innovation that China has adopted from the West. The importation of opium from India into China amounted to 1798 to 300 tons, in 1863 to 3000 tons, in 1866 to 3903, and since then the increase has been still more rapid.*

Opium is chewed, or smoked in a pipe, the latter mode of using it being the more common. The bowl of a long-stemmed pipe is filled with the drug, and, as the opium swells and adheres to the pipe, a needle is in constant use to keep open an air-passage. As the drug burns with difficulty, the smoker must have a light ready at hand for use whenever his pipe goes out.

The number of opium-smokers is considerable, but the great majority of them use the drug only in moderation. The wealthiest mandarins, the most intelligent merchants, smoke opium, as do the humblest coolies. The use of opium is like the use of tobacco among ourselves; nor does it produce any greater mischief, at least among the well-to-do classes; but with the common people it is different. There are establishments specially devoted to opium—smoking-places where, for a trifling sum of money, one may gratify this appetite. Rarely does a smoker leave before he is fully under the influence of the drug, just as the drunkard does not quit the gin-shop until he is fuddled. So used, opium is certainly a dangerous poison, and, according to the testimony of all travellers, the wretches who daily commit such excesses speedily fall to a fearful state of degradation, both moral and physical. Pale, wan, gaunt, shambling along with difficulty, they must have recourse to artificial stimulation in order to regain a part of their wasted energy. Still the injurious effects of opium have in all probability been very much exaggerated; the number of deaths caused by the abuse of the drug is not very great, and many of those who smoke it, even in considerable quantity, retain unimpaired their mental faculties. True, the digestive functions rarely escape impairment. Dyspepsia and general emaciation are the results of this bad habit; but, however that may be, China is not yet by any means on the brink of ruin, and, if she is in a state of decadence, the blame does not attach to opium.

Opium has its antidote: just as we can produce sleep, so too can we produce sleeplessness, by the employment of a mind-poison whose effects are diametrically opposite to those of the other. The antidote of opium is coffee. One hundred years ago coffee was almost unknown, but now there is hardly another beverage that is so widely distributed. Every one has it in his power to judge of the effects of coffee. For some persons it is a stimulus necessary for the performance of intellectual work. In others it produces a painful state of insomnia: taken even

* From the *Revue des Deux Mondes*; in *The Druggists' Circular.*

* The native production of opium has of late years attained very considerable proportions.—*Trans.*

in weak doses it causes restlessness and anxiety, a sort of feverish activity altogether different from the indolent activity of opium. Under the action of opium the will seems to be lulled to sleep and the imagination runs riot. But under the influence of coffee the imagination is hardly stimulated at all; while there does appear to be excitation of the will. Did I not fear being suspected of having a theory to defend, I should say that the faculties of will and consciousness seemed to be super-excited; there is, as it were, a constant strain on attention and memory, whereas in the case of alcohol, hasheesh, and opium, there is a relaxing of attention. Hence coffee produces a true intoxication that fatigues one far more than does the somnolent intoxication of opium, but it leads to the same result. In striving to do too much, the mind does less: under stimulation the will is impaired; and the perfect equilibrium of the mental faculties is disturbed as well by excess as by defect of will.

Coffee is said to produce cerebral anæmia, while opium and alcohol cause congestion; but this theory still needs confirmation. Nevertheless, the part played by coffee in general nutrition is very well understood. It retards organic combustion, and hence it is an *aliment d'épargne*—a food-stuff that effects the saving of other food-stuffs. In the normal state there is always going on within our tissues a multitude of chemical actions, the final result of which is heat production and liberation of carbonic acid. This carbonic acid passes into the venous blood, and the venous blood, on reaching the lungs, parts with its carbonic acid. Thus the quantity of the carbonic acid is, to some extent, the expression of the nutritive activity. Now, on taking coffee, though no greater quantity of oxygen be inhaled, and without increasing the ratio of food, the quantity of the carbonic acid is reduced, and yet the amount of force is not lessened. As illustrating this doctrine, it is usual to cite a fact observed among Belgian miners, who can perform a considerable amount of work almost without food, their strength being maintained solely by the absorption of a large quantity of coffee. Hence coffee is a food-stuff which moderates nutrition by lessening the activity of the chemical transformations incessantly going on within the tissues.

A DEVICE FOR PERFORATING PLASTERS.*

BY JOSEPH P. REMINGTON.

Porous plasters have been used so extensively and their merits of furnishing external medication, whilst permitting the escape of exhalations from the skin, are so well known and appreciated that the notice of the expiration of the patent in the United States, which was circulated a few years ago, was to many pharmacists a welcome one. Since this time several manufacturers have been very industrious in increasing their lists of ready made plasters, and now the varieties are numbered not by tens but by hundreds.

The introduction of rubber into the basis of spread plasters marked an era, and the advantages soon grew to be appreciated. First, the plaster was rendered much more flexible and hence more comfortable to the wearer; the stiff, often brittle, combinations in use were rapidly replaced. Secondly, by a peculiar combination the plaster remained soft and could be applied to the skin without application of heat, and thus it was fair to presume that if a plaster was adhesive at ordinary temperature of the air it would be very apt to stick to the skin, which usually has a temperature of 98·6° F. Thirdly, when to the above valuable points was added perforation, or, as it is techically termed, "porousing," it was believed that perfection was attained.

One of the principal reasons for the decline in the demand for plasters spread by the apothecary has undoubtedly been the superiority of the porous plasters furnished by the manufacturers on a large scale and machine made; the patient recognized this fact and called for them; the apothecary was usually too glad to be relieved of what is almost always regarded as one of the most disagreeable duties of the shop, and hence the prosperity of the manufacturers.

But the same causes which undermine so many industries in our country (as in others) are actively at work among the plasters. Competition and the demand by apothecaries for cheaper products have resulted in depreciating the quality of the plasters furnished, until now in the case of belladonna plaster (probably the most used), the principal manufacturers of rubber combination plasters will each furnish a plaster labelled in bold type, "belladonna plaster," which they will admit contains no belladonna extract. They do sell a higher priced plaster which professedly contains the officinal proportion, but does not this policy tend to sow distrust in the minds of buyers? How can a conscientious pharmacist dispense them as standard goods when he knows that plasters stamped with a lie are sold, and that he has no means of knowing the true from the false without an investigation, which would not occur to every one to institute, and then the facts in the case are usually reluctantly admitted.

It is owing to the lack of medicinal effect in manufactured plasters that physicians in many sections prefer to undergo the inconvenience of the hand-made plaster, and prescribe it because they feel sure of getting what they want, and the writer has endeavoured to supply one deficiency in the hand made plaster by the following device, whereby any apothecary may porous the plaster which he has spread, irrespective of its size or shape or material upon which it is spread.

This device, or tool, consists of a brass cylindrical wheel, $\frac{3}{4}$ in. wide, $\frac{5}{8}$ in. in diameter, with two circular depressions turned out of each end, $\frac{1}{4}$ in. deep, leaving a hub on each end of wheel through which a steel axle passes into the prongs of steel handle, which is driven into an ordinary tool handle 9 inches long.

The cylindrical wheel is studded with 16 punches, arranged on either side $\frac{1}{2}$ in. apart alternately; these punches are of steel, tapered, and are $\frac{1}{4}$ in. long, and $\frac{1}{8}$ in. bore at the end, making a $\frac{1}{8}$ in. perforation.

To operate the tool all that is necessary is to dip it first in water, then having secured the plaster firmly by tacking it to several layers of old newspapers on a rather low counter, grasp the tool tightly with both hands and drive the punches with some force through the plaster, pushing it along, from the operator, the wheel revolving as it is pushed forward, the little disks of plaster collect in the punches, stick together and form a core, which falls towards the axle of the wheel and is driven out by the inclined hub.

A cheaper tool could be made with but one series of punches arranged on the wheel, but two series have the advantage of doing the work more quickly, and less skill is necessary to operate it.

Hand made plasters, spread on kid, may be perforated in this way by hand, and physicians may order any combination that they may desire and secure one of the advantages of the machine made plasters. The tool should be cleaned with cloth moistened with a little turpentine and kept in a box to prevent punches from being injured by coming in contact with hard objects.

* From the *American Journal of Pharmacy*, April.

OPIUM PRODUCTION IN AFRICA.

A new competitor for the enormous profits of the opium trade with China has arisen, and appears to have excited alarm in India. A company was established during the past year at Lisbon called the "Mozambique Opium Cultivating and Trading Company." From this it would appear that Portugal wishes to become the protector of free trade in opium, with the intention of competing with the opium producing districts of India. The promoter of the Lisbon company is Senhor Ignacio Jose de Paiva Raposo, who receives 50,000 acres of open, unappropriated, and cultivated land belonging to the State in Mozambique, and has preference in the choice of "such lands as are suitable for the cultivation of the poppy plant," and also "the exclusive right for twelve years to export opium free of duty through all the custom-houses of the province." The company has been formed with a capital of £178,000 in shares of £22 5*s.* each. A number of the opium cultivators who were taken from India to Mozambique by the promoters of the last company returned here by last mail. They describe the land taken by the company at Mozambique as well adapted for opium cultivators, and say that very large out-turns may be expected. Should Zambesi opium eventually become a formidable competitor of the Indian in the China market, Englishmen have no right to complain. If there is nothing wrong in the opium trade, then surely the Portuguese are as free as ourselves to embark in it. If there is something wrong in it, we who have carried it on for a century through scenes of illegality and bloodshed, are not in a position to taunt Portugal with the immorality. We opened China to opium, procuring its legal admission by a treaty, the benefits of which we cannot confine to ourselves.—*Leeds Mercury.*

A REACTION OF CITRIC ACID.*

BY A. SABANIN AND N. LASKOWSKY.

The authors refer to papers on this reaction by Sarandinaki (*Deut. Chem. Ges. Ber.*, v., 1100), and by Kämmerer, in the same Journal (viii., 736), and then proceed to describe the application to the testing for citric acid.

When citric acid and excess of ammonia (5 grams to 30 c.c.) are heated in sealed tubes at 120° for six hours, a yellow coloration is observed, and small crystals are formed. If the liquid on cooling be poured into a evaporating basin and allowed to stand for several hours, it becomes blue. The crystals disappear, and the colour becomes more intense the longer it stands. After several days the solution turns green, and ultimately becomes colourless again. The green solution appears blue by transmitted light, whilst the blue solution under the same circumstances exhibits great intensity of colour. If the solution be kept in the dark, the change in colour goes on slowly. In an atmosphere of carbonic acid there is no change. When the heating in the sealed tubes is continued for a long time, or the temperature raised to 150°, or when 10 grams of citric acid instead of 5 grams are added to the 30 c.c. of ammonia, the green product is produced directly. The coloration can be produced more quickly by placing the solution over the water-bath after it has been heated in the sealed tubes, but the resulting colour is not so deep.

If the citric acid and ammonia are heated above 160°, no coloration takes place. The authors have not yet separated the colouring matter.

The reaction occurs in the presence of oxalic, citric, and malic acids, even when these acids are present in the proportion of 10 to 1 of citric acid. The only condition necessary is that 10 milligrams of citric acid be present in the solution. In presence of itaconic acid the reaction failed.

For the testing of citric acid in fruit-juices, the following plan is proposed. The juice is mixed with alcohol, left for some hours, and then filtered. Lead acetate is added in excess, the precipitate collected and washed, and ammonia is added in excess. The solution is then evaporated to get rid of ammonia, and sulphuretted hydrogen is added. The lead sulphide is filtered off, and the solution warmed, to get rid of the sulphuretted hydrogen. Barium acetate is then added in excess, and the precipitate and the liquid are heated together; and the precipitate is collected on the filter, washed, and decomposed with sulphuric acid. The supernatant liquid is then heated with ammonia in sealed tubes, as above stated.

The authors remark that the barium salt is not $(C_{65}HO_7)_4Ba_6+7H_2O$, but $(C_6H_5O_7)_2Ba_3+5H_2O$. The former is precipitated only from nearly pure citric acid, so that the precipitation by barium is not a certain test of the presence of citric acid. By this test the authors found this acid in oranges, cranberries, and black currants.

* *Zeitschr. Anal. Chem.*, xvii., 73—76.—From the *Journal of the Chemical Society*, April, 1878.

CALADIUM SEGUINUM OR DUMB CANE.*

The arum family (*Aroideæ*) contains a plant indigenous to South America, the West Indies, and Southern United States, which is considered by some to be one of the most poisonous members of the vegetable kingdom, although it is sometimes even cultivated in gardens. It is the so-called Dumb Cane, or *Dieffenbachia seguina*, Schott (*Caladium seguinum* Vent., *Arum seguinum*, L.). Its stem attains a height of 3 to 7½ feet, the leaves being attached to its upper part in shape of a crest. The latter are oblong-ovate, pointed, and covered with white speckles. The spathe has a pale green colour and is shorter than the spadix, which bears flowers exhaling a cadaverous odour.

The juice of the fresh plant is exceedingly acrid and caustic, so that even very small quantities of it, carried into the digestive apparatus, produce inflammation and dangerous intoxication. It makes indelible stains upon linen, and might be used as indelible ink, if it were less poisonous. It is said that if cattle accidentally bite the leaves, their tongues swell up and their fauces become inflamed. It is therefore necessary to use proper caution in crushing the leaves or expressing the juice for pharmaceutical purposes. A single drop sprinkled upon the skin produces an intense itching and burning, and afterwards inflammation. Some persons are more susceptible to its effects than others, and one case is on record in which a drop, spattered on the cheek, although immediately wiped off, produced an erysipelatous inflammation of one side of the face, so as to seriously endanger the life of the individual. The attack was followed by a herpetic eruption.

The rhizome seems to contain a more diluted juice, and has been recommended by American physicians as a remedy in pruritus vaginæ, in form of lotion prepared by adding from 15 to 20 drops to teacupful of water.

It is, however, remarkable that the tincture exhibits the peculiar acridity of the fresh juice only in a faint degree. The reason of this is, that the fresh juice contains small microscopic crystals (raphides), perhaps an oxalate, which pierce the pores of the skin and set up an inflammation. Alcohol does not dissolve these crystals, and only a small proportion of them apparently pass through the filter. Hence, it follows, that by filtering the tincture through thick paper or through a multiple filter, these crystals are entirely removed, and with them all trace of acridity. This perhaps explains that some physicians have found it to render good service in pruritus, while others found it inert. It may also be that the original recommendation of its use in this complaint is due to the principle "similia similibus curantur," as the juice is intensely irritating. Scholz, who first used it, administered the tincture in doses from 2 to 6 drops. This tincture is prepared by macerating 10 parts of the fresh leaves and flowers, previously bruised with the greatest care, with 12 parts of alcohol of 90 per cent., and expressing. The maximum single dose would be about 0·6 gram or 15 drops, and the highest daily dose about 1·5 gram or about 40 drops. It may perhaps be best given in the form of the mixture, known as

Mistura Antipruritica, Scholz.

℞ Tinc. Caladii seguini . .	0·6–1·5 gm.	(16 to 40 gtt.)
Aquæ destillatæ	150 ,,	(5 fl. oz.)
Syrupi	30 ,,	(6 drach.)

M. A tablespoonful every hour.

* From *New Remedies*, April, 1878.

The Pharmaceutical Journal.

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Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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POISONOUS VIOLET POWDER.

THE hearing of the summonses relating to this matter which was, as stated in last week's Journal, still progressing at the time of going to press, has now been concluded, and the result is that Mr. KING was committed for trial at the Chelmsford Assizes on the charge of manslaughter, so far as relates to the cases of the children MARTIN, SEARS, and HARRINGTON, all of whom, according to the medical evidence brought forward, died in consequence of the application of a powder sold by the defendant as violet powder and containing a large amount of arsenic. In addition to this the defendant was committed on the further charge of misdemeanour, and the magistrates required him to find bail in the amount of two hundred pounds himself, together with two sureties for the same amount.

In the reports which have appeared in the daily papers Mr. KING is described as a wholesale chemist, but this description is not borne out by reference to the London Directory, where no such name as HENRY GEORGE KING appears in the list of wholesale chemists, or, more properly, wholesale druggists. Neither is it to be found among the names of chemists and druggists or even those of drysalters. Indeed it appears that the shops where this arsenicated preparation was sold were not those of chemists and druggists, or such as are commonly supplied with goods by wholesale druggists, but rather of that order in which patent medicines and various drugs or preparations used as popular remedies are sold, together with oil shop goods, by persons whose chief idea is to supply a low priced article.

Violet powder, however, is one of those articles which constitute the miscellaneous stock of most chemists and druggists, and doubtless the sale of it by them has in many cases been interfered with by the alarm caused by the sensational reports we protested against some weeks since. It is satisfactory to find that the evidence brought forward in the case above referred to has shown that there is no ground for the apprehension too readily entertained by our contemporary, the *Lancet*, to the effect that the cases in which this arsenical powder had been sold were not exceptional, and that there was still less foundation for the assertion that "the powder commonly sold is not by any means innocuous." On the contrary, the poisonous powder appears in all the cases to have been traced to one source, which is, at any rate, other than the chemist and druggist or the wholesale druggist.

In speaking of this matter before we abstained from offering any remarks on the improbability that a chemist and druggist, or any person conversant with the nature of violet powder, could sell as such an article containing one-fourth its weight of white arsenic, and whatever may eventually prove to be the conditions under which this admixture was made in the cases now being investigated, it will not be out of place to remind purchasers of such articles, that when for the sake of a delusive cheapness they forego the advantage to be derived from the skill and experience of the qualified chemist and druggist, they not only incur serious risk to themselves, but act unfairly towards those on whom they might safely rely for being supplied with unadulterated goods.

THE PROPOSED ADMISSION OF WOMEN TO THE PHARMACEUTICAL SOCIETY.

LETTERS still continue to reach us in reference to the question whether women shall be admitted to membership of the Pharmaceutical Society; but since they, like those already published in this Journal, do not in any degree contribute to a settlement of the question or even to decide the difference of opinion prevailing as to the tendency of the vote taken at the late general meeting we do not think any useful purpose would be served by continuing to publish any more of these communications.

In referring to this matter, however, it may be pointed out that whichever of the two numbers of votes counted at the late meeting is to be regarded as representing the advocates of the admission of women into the Society as members, the balance of opinion appears to be so equal that it would be hazardous to say in which direction it really tends among the mass of those who are entitled to vote upon the question, or perhaps even among the still smaller number who would care to vote upon it.

We do not think that the suggestion made by Mr. VIZER in his letter in last week's Journal could be officially adopted for the purpose of ascertaining the general feeling of the Society. Still, the idea it conveys is not a bad one, and it might serve to put an end to a discussion which has somewhat of an acrimonious tendency if every member of the Society who is an advocate of the admission of women to membership were to send a post-card with his name and address to Mr. WADE, and everyone who is adverse to this step were to send one to Mr. VIZER. A non-official poll of the Society might thus be obtained which would express more correctly the feeling of the Society than the voting at any general meeting seems likely to do. So far as the latter is to be taken as a criterion it must be regarded as being virtually in accord with the action of the Council in respect of this question.

We hope, therefore, that all who are entitled to vote will take this mode of making their views known, or that at least those who have strong opinions one way or the other will do so.

DESTRUCTIVE FIRES.

On Saturday last, the whole of the building in Virginia Street, Glasgow, occupied by the Glasgow Apothecaries' Company, was destroyed by fire. Smoke was observed issuing from the windows of the "Hall" at three o'clock in the morning. The alarm was at once given, and the fire brigade was soon in attendance, but the flames had obtained such a hold as to preclude more being done than to confine the conflagration to the company's premises. The damage, including the stock, fixtures and buildings, is estimated at £30,000, of which £27,000 is covered by insurance.

On Wednesday a fire broke out on the premises of Messrs. May and Baker, manufacturing chemists, Battersea, which resulted in the destruction of the camphor refinery and other parts of the establishment. The accident is attributed to the over-heating of a flue.

At Ilfracombe, also, last week, while an assistant in the shop of Mr. Moon, pharmaceutical chemist, was melting the ingredients of an ointment over a gas stove, the mixture boiled over and ignited, and the flames spread so rapidly that, although extinguished in a few minutes, the damage has been estimated at £200.

HYPODERMIC STRYCHNIA POISONING.

The last published report of the Berlin University Surgical Clinique, in the Archiv für Klinische Chirurgie, contains the case of a child three and half months old, which died after a subcutaneous injection of 0·0006 gram ($=\frac{1}{100}$ grain) of nitrate of strychnia administered for prolapsus ani.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association will be held at 17, Bloomsbury Square, on Thursday evening, June 27, when a paper by Mr. Walton will be read on the "Form of Leaves."

German Chemical literature has, according to *Nature*, just been enriched by a new text-book on inorganic chemistry, by Professor Kolbe, who justifies its production by his opinion that the existing works in that language with the exception of the translation of Roscoe's 'Chemistry,' contain far too much matter for elementary treatises. Professor Wislicenus, also, is said to be engaged on a new German edition of Regnault's 'Chemistry,' which will be the ninth that has appeared in that language.

Provincial Transactions.

THE LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

On Tuesday, June 4th, a lecture was delivered in the rooms of the above Association, No. 4, Halford Street, by Mr. W. B. Clark. Subject, Opium and some of its preparations.

The lecturer began by stating what knowledge the ancients had of this important drug, the derivation of its name and the plant yielding it. The time and manner of cutting the capsules were explained, also the effect of rain or heavy dew upon the juice. In exhibiting some specimens of opium, the audience was shown the various points to be noticed in its selection. The various tests for the per-centage of morphia were explained and commented upon. In describing the extract, Mr. Clark called attention to the fact that though the extract is about twice as strong as the opium, yet according to the B.P. the doses are the same, viz., $\frac{1}{2}$ to 2 grs. Allusion was also made to the common practice of making the tincture from moist opium, instead of the dried, without allowing for the water it contains; also, to the more uniform amount of morphia contained in the tincture made in large quantities than in that made in small quantities. In the latter case one piece only of opium may be used, which may be rich or poor in morphia, and thus affecting the tincture. The antidotes used in cases of poisoning were enumerated.

When the lecture was concluded a hearty vote of thanks was given to the lecturer.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The annual meeting of this Association was held on Friday, May 31, the chair being occupied by the Vice-President, Mr. R. Fitz-Hugh, F.C.S.; there was a moderate attendance of members. After the minutes had been read and confirmed the honorary secretary (Mr. R. Jackson) read the annual report of Council:—

"In presenting their Annual Report the Council have great pleasure in being able to congratulate the members of the Nottingham and Notts Chemists' Association on the improved position of the society. Both numerically and financially it is in a better position than last year, and what is more gratifying still greater personal interest and sympathy have been shown by the members.

"Five general meetings have been held. At the first, the attendance was so meagre that the President declined to give his inaugural address and the meeting was adjourned and a committee appointed to wait on the absentees to ask them to attend the next meeting and decide as to the future of the Association. At the adjourned meeting, which was the largest assemblage of Nottingham chemists ever held, the President delivered an able address, and after clearly showing the value of such associations and the work that had been done in the past here and alluding to the apathy which existed, he put the question to the meeting, Shall the Association be carried on or not? and if so, in what way?

"The answer to the first part of the question was unanimously in the affirmative; to the second part various suggestions were offered, it being thought that the meetings were scarcely attractive enough, and after considerable discussion it was ultimately decided that meetings should be held at the rooms, when papers should be read and lectures given, alternately with social meetings for members only. This arrangement appears so far as experience has yet shown to have produced a better attendance. and the Council would earnestly echo a remark of the President that every member who attended the social meetings should make it a point of honour to attend the educational ones also.

"Three meetings were held subsequently, one a social one, to discuss trade questions introduced into President's address and two others at the rooms of the Association when most interesting and instructive lectures were given, on 'Germs' by Mr. H. Major, B.A., F.R.G.S., and 'Electricity' by Mr. F. H. Spenser, at all of which there was a good attendance.

"The annual supper was held in January and was as usual a success.

"Your Council were not able to arrange for a special class for the associates during the past session, they therefore thought it desirable that the associates should attend either the course on Botany or Inorganic Chemistry at the Mechanics' Institute, and as an inducement have promised prizes in each subject to the two highest of our associates on the pass list of the Science and Art Department.

"Professor Attfield adjudicated on the examination papers of associates at end of last session and the prizes were awarded to Mr. J. Clower and Mr. J. Cox for exceptionally good papers.

"At the early part of the session three members (Messrs. Reuben Widdowson, William Widdowson and James Beardsley), who were formerly students, generously offered to assist the associates in their studies at the weekly meetings for mutual improvement. Unfortunately, through illness, Mr. Beardsley was not able to take an active part, but the other gentlemen assisted the students on alternate weeks the one in Chemistry and the other in Botany; they report an average attendance of ten at the meetings, with great attention and perseverance. The Council are very pleased that the kind offer of those gentlemen has been so well appreciated as evidenced by the good attendance, and they think the warmest thanks of the Association are due to Messrs. Reuben and William Widdowson for their exertions on behalf of the associates.

"Mr. William Widdowson kindly offers to continue his services during the summer by taking the associates on a botanizing excursion every other Tuesday afternoon from 2·30 till 5 and the Council hope that every member will give all possible facilities for his apprentices to join that class and that every student will make an effort to attend regularly, as such an opportunity of gaining a practical knowledge of botany is seldom offered.

"The Council have to acknowledge, with gratitude, the receipt of the following handsome donations which have materially swelled the balance in Treasurer's hands:—£5 from Mr. Edward Harvey, of London; £5 5*s.* from Messrs. Langton, Harker and Stagg, London; £5 5*s.* from Messrs. Hearon, Squire and Francis, London; and also the gift of the following books:—'Pharmacographia' and 'Science Papers,' from Mr. Thomas Hanbury, in memory of his brother, the late Mr. Daniel Hanbury; Wills's 'Elements of Pharmacy,' from Mr. James Beardsley; the 'Year-Book of Pharmacy,' from the Pharmaceutical Conference; the 'Calendar of the Pharmaceutical Society;' and 'Catalogue of Collections in Museum;' and *Pharmaceutical Journal*, regularly every week, from the Pharmaceutical Society, and your Council would be glad to see such good examples followed by other donors.

"The Council have made the following additions to the library: — Bentley's 'Botany,' Valentin's 'Qualitative Analysis,' Thorogood's 'Guide to Materia Medica,' Buckmaster's 'Advanced Chemistry,' Cook's 'Botany,' and Smith's 'Pharmaceutical Guide to 1st and 2nd Examinations;' and finding from the report of the Sub-Librarian that the specimens in materia medica cases are not in such good order as could be wished, recommend their successors to replace such specimens as may be necessary.

"The library, which has been well used by the students, now contains seventy-one books.

"The balance in Treasurer's hands amounts to the magnificent sum of £48 7*s.* 2*d.*

"The Association now numbers fifty-eight members (four country), and twenty-two associates; last year the numbers were fifty-four and twenty-one, the increase is satisfactory as regards members, but the Council think in so large a town as Nottingham, and with such a list of members, there should be more than twenty-two associates, and would earnestly urge the members to use their influence with the young men in their employ to avail themselves of the advantages offered by the Association.

"The Council have to regret the loss of the President, Mr. J. H. Atherton, F.C.S., who has left Nottingham. As the members are aware, he was a gentleman who took a most active part in the work of the Association since its commencement, more than nine years ago, and during the greater part of that time he filled the Presidential chair to the satisfaction of the members and with credit to himself. The Council could not allow him to leave without giving him some token that his services had been appreciated, they therefore presented him with an illuminated address, and they take this opportunity of recording their deep sense of the loss the Association has sustained and their personal regret at losing a colleague with whom they had worked so harmoniously and whose good judgment and energy were so conspicuous in all that concerned the welfare of the society."

The Treasurer (Mr. J. Rayner) then presented his report showing a balance in hand of £48 7*s.* 2*d.*

Mr. Ward proposed, and Mr. Wilson seconded, that both reports be received and adopted. The chairman in supporting the motion recommended the incoming Council to increase the museum and library, and referred to the offer of Mr. Widdowson to take the associates on a botanizing excursion every alternate Tuesday, and urged the members to give every facility for their apprentices to join that class. Mr. Warriner thought a set of drawers for specimens similar to those in the Museum of the Pharmaceutical Society would be very useful for the students and also a book of autograph prescriptions, and offered, if members would send him any prescriptions to mount them and have them bound for the use of the Association. After a few remarks from other gentlemen, the reports were passed and the various recommendations left in the hands of the incoming Council.

The following officers were then appointed for the ensuing year:—President, Mr. R. FitzHugh, F.C.S.; Vice-President, Mr. Frank White; Treasurer, Mr. J. Rayner (re-elected); Honorary Secretary, Mr. R. Jackson (re-elected); Auditors, Messrs. J. Lomas and M. H. Humphreys; Council, Messrs. C. A. Bolton, T. B. Fletcher, Jenkins, Lewis, Smith, Warriner, W. Widdowson and Wilford.

The President then proposed a hearty vote of thanks to Messrs. W. Widdowson, R. Widdowson and James Beardsley for their exertions on behalf of the associates and the valuable assistance they had rendered to the class. This was seconded by Mr. Smith and supported by Messrs. Ward, Lewis and White, and carried unanimously. Mr. W. Widdowson suitably responded.

Mr. Ward, Mr. Smith and Mr. Wilford each offered prizes for competition amongst the associates next session, in Pharmacy, Botany and Chemistry.

A vote of thanks to the Executive and Council for their past services brought the meeting to a close.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, June 6; Dr. Gladstone, President, in the chair.

After the confirmation of the minutes of the preceding meeting, the following certificates were read for the first time: J. J. Watt, J. Treharne, E. W. Napper, and P. H. Walsh.

The first paper was read by Dr. Gladstone; it was entitled—

Analogies between the Action of the Copper Zinc Couple and Occluded and Nascent Hydrogen. By J. H. GLAD-

STONE, F.R.S., and ALFRED TRIBE.—The authors have recently shown that finely divided copper charged with hydrogen converts nitre into potassium nitrite and ammonia; they have since found that hydrogen in association with the same metal reduces potassium chlorate to the chloride. They have observed that the copper zinc couple in the presence of water converts nitrobenzol into aniline, a reaction which the authors have utilized for the detection of small quantities of nitrobenzol as follows:—"Add some twelve drops of strong copper sulphate solution to three or four pieces of zinc foil ($1'' \times \frac{1}{2}$) in about 5 c.c. of water, wait till the liquid is completely decolorized, pour off the zinc sulphate solution, and wash the conjoined metals three or four times with water. Now add to this couple the nitrobenzol in solution, or in suspension in water, heat nearly to boiling for about two minutes, filter, cool, and add, drop by drop, a solution of bleaching powder. The nitrobenzol in 5 c.c. of an 0·05 per cent. solution in water can thus be detected." The present paper contains chiefly the results of the authors as to the actions of palladium hydrogen, platinum hydrogen, and carbon (cocoa nut charcoal) hydrogen, on the substances enumerated in the table appended, which gives the principal reactions observed:—

Substances employed in Aqueous Solutions.	Substances produced by—				
	Copper Zinc Couple.	Palladium Hydrogen.	Platinum Hydrogen.	Copper Hydrogen.	Carbon Hydrogen.
Potassium Chlorate	Chloride.	Chloride.	Chloride.	Chloride.	Chloride.
„ Nitrate	Nitrite and Ammonia.*	Nitrite and Ammonia.*	Nitrite (?) and Ammonia.	Nitrite and Ammonia.	No Action.
„ Ferricyanide	Ferrocyanide.	Ferrocyanide.*	Ferrocyanide.		Ferrocyanide.
Nitrobenzol	Anilin.	Anilin.	Azobenzene.		
Indigo (in the presence of weak potash)	White Indigo.	White Indigo.			
Sulphurous Acid	Sulphur.	Sulphuretted Hydrogen.	Sulphur.		
Arsenious Acid	Arseniuretted Hydrogen.	Arsenic.	Arsenic.		

The results marked * have been obtained by previous observers.

In conclusion, the authors draw attention to the close analogy between the action of the copper zinc couple, of occluded, and of nascent hydrogen in some cases, and point out that the results corroborate their previous view that the power of the copper zinc couple depends to a great extent on the hydrogen absorbed by the finely divided metal. They also discuss the various explanations of the above reactions. The paper was illustrated by some experiments, which were performed by Mr. Tribe.

Dr. Russell took the chair during the reading of the above paper.

The next paper was read by Dr. Wright—

On the Alkaloids of the Aconites. Part III. By C. R. A. WRIGHT and A. P. LUFF.—The authors find that aconitine is readily dehydrated by heating in contact with acids (preferably tartaric) forming apo-aconitine $C_{33}H_{43}NO_{12} = H_2O + C_{33}H_{41}NO_{11}$. The new base closely resembles the parent alkaloid and is formed from it during extraction to some extent; its hydrobromide appears to be more soluble than aconitine hydrobromide, as the mixture of bases yields pure aconitine on conversion into hydrobromide, recrystallization and regeneration of the alkaloid. By saponification aconitine splits up in $C_{33}H_{43}NO_{12} + H_2O = C_7H_6O_2 + C_{26}H_{39}NO_{11}$ forming benzoic acid and a new alkaloid, aconine, readily soluble in water and chloroform, insoluble in ether. Probably the substances described as napelline and acolyctine by Hübschmann are aconine more or less pure. On treating aconitine with acetic or benzoic anhydrides it loses water and forms a derivative in which H is replaced by an acid radical; thus acetylapoaconitine $C_{33}H_{40}(C_2H_3O)NO_{11}$ and benzoylapoaconitine $C_{33}H_{40}(C_7H_5O)NO_{11}$ are obtained. On treating aconine with benzoic anhydride it gives the same product as that formed by aconitine, so the formula of aconitine is indicated as $\left(C_{26}H_{35}NO_7\right)\begin{cases}OH\\OH\\OH.\\OCOC_6H_5\end{cases}$ Apoaconitine being $\left(C_{26}H_{35}NO_7\right)\begin{cases}=O\\-OH\\-OCOC_6H_5\end{cases}$ and aconine being $C_{26}H_{35}NO_7\begin{cases}OH\\OH\\OH\\OH\end{cases}$ Dibenzoyl apoaconine or benzoyl apoaconitine has the formula $C_{26}H_{35}NO_7\begin{cases}=O\\-OCOC_6H_5.\\-OCOC_6H_5\end{cases}$ Similarly pseudaconine gives rise to analogous derivatives, the dibenzoyl and diacetyl bodies having been prepared. Picraconitine splits up on saponification into benzoic acid and a new base, picraconine (much resembling aconine), $C_{31}H_{45}NO_{10} + H_2O = C_7H_6O_2 + C_{24}H_{41}NO_9$. Besides crystallizable aconitine, *A. Napellus* yields a considerable quantity of non-crystalline alkaloids which contain more carbon and are of lower molecular weight than aconitine; these are probably formed from aconitine by alteration during extraction. One conclusion, to which the authors call special attention, drawn from the above research is, that no practical difficulty exists in preparing from *A. ferox* and *A. Napellus*, well crystallized salts or alkaloids of constant composition and high physiological activity, whence it is evident that the amorphous preparations now sold as aconitine, which vary immensely, should be replaced by pure crystallized alkaloids. The commercial product often contains 40 and even 80-90 per cent. of uncrystallizable bases more or less inert.

The next paper was *On the Alkaloids of the Veratrums.* Part I. *Alkaloids of Veratrum Sabadilla* (*Assagræa officinalis*). By C. R. A. WRIGHT and A. P. LUFF. The authors discussed the results obtained by previous observers, Couerbe, Merck, Weigelin, Schmidt and Köppen. The discrepancies observed between the results of these chemists are due to the alteration and decomposition of the original bases during the processes of extraction and purification. The authors have examined the alkaloids obtained from *V. sabadilla* seeds by percolating the crushed seeds with alcoholic tartaric acid, evaporation, separation from resin and extraction by numerous and prolonged shakings with ether. The alkaloids obtained were three: (1) Veratrine (Couerbe) $C_{37}H_{53}NO_{11}$. On saponification it splits up $C_{37}H_{53}NO_{11}+H_2O=C_9H_{10}O_4+C_{28}H_{45}NO_8$ (dimethylprotocatechuic acid being formed; this acid is identical with Merck's veratric acid and the acid obtained by similar treatment from pseudaconitin) and a new base verine. The authors propose to restrict the name "veratrine" to the above alkaloid; it does not crystallize, but its sulphate and hydrochloride can be obtained in the crystalline state. (2) Cevadine (veratrine of Merck) $C_{32}H_{49}NO_9$. This alkaloid was obtained by Merck, Schmidt and Köppen, who assigned to it slightly different formulæ. Weigelin also obtained this substance in a very impure condition. On saponification it splits up $C_{32}H_{49}NO_9+H_2O=C_5H_8O_2+C_{27}H_{43}NO_8$, forming a new base, cevine, and an acid identified as methylcrotonic acid, and with the cevadic acid of Pelletier and Caventou; the benzoyl compound is beautifully crystalline. The formula of cevadine is probably $(C_{27}H_{41}NO_6)\begin{matrix}-OH\\-O{\cdot}COC(CH_3)=C_2H.\end{matrix}$ It is probably closely connected with the aconite alkaloids. (3) A new base, amorphous, yielding no crystallizable salts and forming cevadic acid on saponification, having a formula $C_{34}H_{53}NO_8$. This body resembles to a certain extent Weigelin's sabadilline, but in other respects is quite dissimilar. The authors propose to call it *Cevadilline.* No trace of anything like Weigelin's sabadillin could be detected; a commercial product sold as "sabadillin" consisted chiefly of cevadilline. Both the above contain the details of 40–50 analyses and quantitative determinations.

Dr. Gladstone said the Society had to thank the authors for the large amount of labour which they had bestowed on a subject of much difficulty, and for the positive knowledge which was now gained of substances, most undesirable to work with, in place of the varying statements hitherto published.

In answer to Mr. Maxwell Lyte, Dr. Wright said that the above alkaloids gave for the most part colour reactions with sulphuric acid, but it was difficult to distinguish the colours when a small quantity of the alkaloid was present with much organic matter.

The next paper was by J. W. Thomas, *On the Action of Hydrochloric Acid upon Chemical Compounds.* It was read by the Secretary. The author has studied the action of hydrochloric acid on various substances in three ways:—(1) Chemical compounds were introduced into tubes containing hydrochloric acid gas standing over mercury; (2) A current of dry hydrochloric acid was passed over chemical compounds placed in a glass tube; (3) Chemical compounds were dissolved in water and different proportions of hydrochloric acid added and then distilled over a water-bath at 100° and in a vacuum at 15° or 30°. By these methods the action of hydrochloric acid on many salts has been examined; the list includes various nitrates, tartrates, citrates, chromates, antimoniates, hypochlorites, sulphates, permanganates, ferrocyanides, oxalates, etc., in all about thirty salts.

The next paper was *On the Action of Oxides on Salts.* Part I. By E. J. Mills, D.Sc., and D. Wilson. It was read by the Secretary. The object of the present research is to determine the law in consequence of which the action of oxides on salts leads, in general, to the formation of other oxides derived from the salts in question. The authors have investigated at present the action of tungstic, silicic and titanic oxides on potassic carbonate, at a high temperature, by determining the loss of weight (from the escape of CO_2) during ignition. The reactions have been studied with great care, and corrections for various errors carefully made: the authors give several formulæ deduced from their experimental results. One of the results arrived at is that the chemical effect of an oxide and a carbonate acting on one another under the conditions specified is directly proportional to the product of their active masses and inversely proportional to the sum of their residues. The authors conclude their paper with the following inference: "That Brodie's fundamental equation represents the mutual action of two bodies under unit conditions, apart from change of weight, and with the unit of chemical effect."

The next paper was read by Dr. Senier, *On a New Test for Glycerine*, by A. Senier, M.D., and A. J. G. Lowe. This test is founded on the fact observed by Iles, that borax when treated with glycerine gives to a Bunsen flame the green colour characteristic of boracic acid. The test is applied by the authors, and the solution is rendered slightly alkaline by dilute soda, and a borax bead placed in it for a short time. The bead is then held in a Bunsen flame, if the solution contains 1 per cent. of glycerine a distinct reaction is observed. Erythrite and glycol give the same colour, or a little of the solution is mixed with same powdered borax, and some of the mixture placed on a platinum loop and heated as before. By means of this test, after concentration, etc., $\frac{1}{10}$ of a per cent. of glycerine was detected in beer, 1 per cent. in sherry, 1 per cent. in milk, 5 per cent. in treacle.

During the reading of the last papers Mr. Warington occupied the chair.

The last paper was read by G. S. Johnson, *On Ammonium Triiodide.*—The author has prepared this substance by dissolving iodine to saturation in a strong aqueous solution of ammonium iodide, and (2) by stirring crystals of ammonium iodide and iodine with a small quantity of water till the resulting black liquid refused to dissolve more of either ingredient. The liquid was evaporated over sulphuric acid, and in a few days crystallized. No iodide of nitrogen was formed. This substance is more stable than the corresponding potassium salt. NH_4I_3, crystallizes in dark blue prisms, usually tabular and isolated. It is soluble in a small, but decomposed (with deposition of iodine) by a large quantity of water, and is slightly deliquescent; when heated it loses iodine and becomes coated with NH_4I, without fusing. Sp. gr. of crystals 3·749: at. vol. 103·07.

Specimens of the alkaloids obtained by Wright and Luff, and of ammonium triiodide, were exhibited; also some combustion furnaces from Messrs. Bel.

After the thanks of the meeting had been given to the authors for their respective papers, the Society adjourned to June 20, when the following papers will be read:—

1. Contributions to the History of Naphthalene. II. β Naphthaquinone Derivatives, by T. Stenhouse and C. E. Groves; 2. On Pyrotritartaric and Carbopyrotritartaric Acids, by G. Harrow; 3. Laboratory Notes, by H. E. Armstrong; 4. Octylic Alcohol and its Derivatives, by E. Neison.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting of the above Association was held on Wednesday evening, May 22, at its room, 29, Brewer Street, when Mr. A. Sawden read a paper on "Water Analysis in connection with Pharmacy." The author thinking that water analysis might in future form a more important branch of the pharmacist's duty than it does at present proceeded to sketch out the chief points in the methods of determining the quality of a sample. After a discussion, in which Messrs. Princep, Wallis, Branson, and Glover took part, a vote of thanks was accorded to Mr. Sawden. The secretary then read several queries put by members, and an answer to a former one.

On Wednesday evening, June 5, at a meeting of the above Association, Mr. Wallis, President, in the chair, a paper on 'Internal Parasites' was read by Mr. Smart, of the Queckett Microscopical Society. The attendance of members was numerous, and the paper, which was illustrated by diagrams and specimens, was heartily applauded. After a short discussion, the usual vote of thanks was passed to the reader, and the many and beautiful microscopic specimens illustrating the paper were then examined and described. The next meeting was announced for July 3rd

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting of the above Association was held at 17 Bloomsbury Square, on Friday evening, June 7, Mr. W. R. Atkins in the chair. In consequence of the resignation of Mr. Savory, Mr. Parker was elected Vice-President and Mr. Thompson member of committee. Mr. Naylor then read a paper on "Soap" in which the composition and manufacture of the various kinds of soap were fully discussed. The microphone was then exhibited by Dr. Senier, accompanied by the following explanation:—

THE MICROPHONE.

BY DR. A. SENIER, F.C.S.,

Demonstrator in Laboratories of the Pharmaceutical Society.

"At a previous meeting of this Association my brother, Mr. Harold Senier, exhibited and described the then recently discovered telephone. It was thought at the time that so rapid a stride had been made in acoustic science that there must surely come a lull. Ere a few weeks, however, had passed away another instrument, the phonograph, was announced by Mr. Edison, which like the telephone of Professor Graham Bell originated in the United States. The public thus accustomed to announcements of great discoveries in acoustic science were not so much surprised as otherwise they would have been when the microphone was announced by Professor Hughes in a paper read before the Royal Society* scarcely a month since. The microphone is in itself a discovery at least as important as the telephone or phonograph, but the three taken together mark an era in acoustic science.

"I desire to show you this evening the microphone and some of its applications. So far as the newness of the subject will permit I will endeavour also to explain the reason assigned for its action. Here is a simple form of telephonic circuit. In the circuit of a single insulated wire are fixed two Graham Bell telephones. If one of these be held near the ear you know that sounds produced near the other are transmitted both as regards loudness, pitch, and timbre. I now introduce into the circuit a weak constant battery, in this instance composed of two manganese cells. If you now listen at one of the handles you will hear sounds produced near the other with greater distinctness but not otherwise different. You will remember that it is supposed that when a sound wave strikes the iron disc of the transmitting telephone corresponding waves or impulses of electricity are induced and conveyed along the wire to the receiving telephone where they cause the disc to vibrate and reproduce the same wave motion of the air, or the same sound.

"Professor Hughes, in view of previous researches upon the action of strain and of heat and light upon the conductivity of metals, "believed that the wire would vary in its resistance when it was used to convey sound." In order to investigate this he constructed a telephonic circuit similar to the one we have here. One part of the wire he stretched so that it might be vibrated sonorously. If the resistance varied in the wire waves would be formed and sounds would be produced in the telephone. The stretched portion of the wire was stretched more and more and at the same time made to vibrate to its note, but nothing was heard from the telephone until the breaking point was reached. At that point a peculiar rushing sound was always heard. In trying to imitate this breaking condition he found that "if the broken ends rested upon one another with a slight pressure of not more than one ounce to the square inch on the joints, sounds were distinctly reproduced, although the effects were very imperfect." Now I have here broken the circuit by removing one of the telephones and hold in my hands the two terminal wires. I cannot in this room show you that sounds produced in the neighbourhood of these wires when pressed together are reproduced by the telephone, but you observe that when the two wires are rubbed together sounds are produced, which I think you can hear all over the room. It may be useful here to point out that the production of these sounds furnishes an easy test of the completeness of the circuit. If no sound is heard from the telephone, when the terminals are rubbed together, successive portions of the circuit should be tested in the same way, including always a telephone, and at least one cell of the battery. In this way the fault may be readily localized. The occurrence of these sounds was known, I believe, before the discovery of Professor Hughes, which is, that sounds and articulations are transmitted by the pressed wires. For this purpose they constitute a very imperfect instrument, and even with the crudest materials Professor Hughes soon much improved upon it. Finally by the use of gas carbon terminals, he succeeded in constructing the instrument, a copy of which I hold in my hand. This not only transmits sound, as regards pitch and timbre, but greatly increases the loudness. It is a magnifier of sound, a microphone.

"This instrument is one of the best forms of microphone. A flat piece of wood, insulated from the table by pieces of rubber tubing, acts as a sounding board, another piece nailed perpendicularly to it supports the carbon terminals. Gas carbon is a good conductor and does not oxidize. On the inside of this support are attached two little cubes of gas carbon, each with a deeply concave face to hold very loosely a small cylinder of the same material. This cylinder is about two inches long and one eighth or one quarter of an inch in diameter; it is made conical at the bottom and reduced to a cylinder half the size at the top. The cubes of gas carbon are each connected by a copper wire with a binding screw, by which screws the microphone can be introduced into the circuit. In the case of the two wires, there was but one place where molecular continuity was broken, but where electrical continuity remained. In this instrument there are two such places, one at each end of the gas carbon cylinder. Here is another form of microphone less sensitive than the one just described; it is therefore better for loud sounds. It has a gas carbon cylinder arranged as an unequal beam, the long arm resting on a wedged shaped piece of carbon. The whole is attached to a flat piece of wood which acts as a sounding board. There are two binding screws, one attached to the cylinder the other to the wedged shaped piece of carbon. For many purposes this even is too delicate. When that is the case the long arm of the cylinder should be weighed, or an elastic band stretched over it.

"Notice that I have now introduced into our short circuit the more sensitive microphone; the circuit already contains a telephone and the battery. You will now listen to the telephone, while I drop fragments of paper on the sounding board of the microphone. The sound which is scarcely audible to the unaided ear, by means of the microphone you hear loudly and clearly. Likewise, if I touch, however lightly, the sounding board, the telephone emits a distinct sound. This green covered wire is double, and extends some fifty yards to a distant part of the building. It is kindly lent to us this evening by Mr. Yeates, of Covent Garden, by whom most of the apparatus exhibited to-night has also been constructed. Mr. Dunstan and Mr. Graham are at the other end of this long circuit, and tell me through the telephone that they have the horizontal microphone in the circuit there. I will now ask them to speak to the microphone. The sound is not so clear as it would be if the rooms were quieter. The microphone is not yet under such control as the telephone, and has a habit of making too much noise. Well, I cannot show you that speech is transmitted, but you must take my word for it, that in perfectly quiet rooms I have distinctly heard my brother read at a distance of some eight yards from this more sensitive microphone, and through a long circuit of wire. A small musical box has been placed near the microphone. You hear it distinctly when the telephone is placed near the ear. The loud ticking which you now hear is that of a watch. These somewhat crude experiments

* *Chemical News*, xxxvii., 197.

serve at least to indicate the leading action of the microphone as a transmitter and magnifier of sound.

"Now that we have heardsounds transmitted and magnified by the microphone, let us examine wherein it differs essentially from the telephone, and also the theories assigned for its action. In the case of the telephone we speak to a diaphragm, the vibrations of which affect the circuit, while in that of the microphone we speak to a part of the circuit itself, to the terminals where molecular continuity is broken, but where electrical continuity, more or less complete, remains. In the case of the telephone, pulsations of the current are caused by vibrations of the disc, in that of the microphone by pulsatory pressure at the terminals, of whatever material they may be composed. In the case of this horizontal microphone, pulsatory pressure occurs where the heavy arm of the carbon beam touches the wedge-shaped piece of carbon. We quite well understand that corresponding pulsations are reproduced by the receiving telephone. The microphone does not replace the receiving telephone, so that if any of you purchase the microphones, now so much lauded in advertisement columns, remember that they are of no use without a battery, and, at least, one telephone. Now, if Professor Hughes would allow us to say that the carbon cylinder causes the variations in pressure which I have just described, by vibrating as a mass to the sounds produced in its vicinity we should think the theory of the microphone easy. The result of many experiments, however, leads him to think that this is not the case. In order to account for the variation of pressure he proposes the following theory:—"If we assume a line of molecules, we know that a sonorous wave is accompanied by alternate compressions and rarefactions. If we isolate the part under compression from the part under dilation we vary the dimensions of the mass, and we alter its electrical resistance. In any homogeneous conductor of finite dimensions the effect of the one will exactly compensate for the effect of the other, and we get no variation of current; but if we break up this homogeneous conductor into a series of minute subdivisions, without actually breaking their electrical continuity, we destroy its neutralizing influence, and we render evident the effect of sonorous vibrations in varying the dimensions of the mass of the conductor, and therefore in varying its electrical resistance, for we reduce the length of a portion of the conductor to a fraction of a length of a sonorous wave." Again, he says, "I regard the action as follows:—If we have two separate conductors joined simply by contact this contact offers a certain resistance. Now we can vary or lessen the resistance by increasing the pressure, thus bringing more points in contact or closer proximity. Now as I employ a constant pressure on the contact, which is exactly under the same influence of the vibrations as the points of contact, more points or closer proximity can only be obtained through the molecular swelling or movement of the contact points."

"We have seen the application of the microphone as a substitute for the transmitting telephone. In this way it may possibly be the means of reporting at a distance speeches or music occurring in its vicinity. In surgery it has been tried, but so far with little success. We must remember that it is only some three weeks old, and considering what the microscope has done for research as an aid to sight certainly great possibilities are open to the microphone as an aid to hearing."

Votes of thanks were unanimously awarded to Mr. Naylor and Dr. Senier for their interesting communications.

Parliamentary and Law Proceedings.

Arsenical Violet Powders.

Henry George King, wholesale chemist, of 14, Abbott Street, Kingsland Green, appeared on Friday, the 7th inst., on remand, at the Epping Petty Sessions, to answer the charge of having, on February 18 last, in the parish of Loughton, in the county of Essex, killed one Eliza Sear. A second summons charged him with having, on Jan. 1, 1877, and on divers other days, unlawfully, falsely, fraudulently, and deceitfully sold and delivered, and caused and procured to be sold and delivered, to divers persons residing in the said parish, to wit, to Isabella Martin, Sarah Mead, Elizabeth Sear, Mary Harrington, and others, quantities of violet powder, containing large proportions of a poison called white arsenic, and other ingredients, for the purpose, and with the intent, that the said poisonous powder should be applied to the bodies of children of tender years, and that he caused and procured the said poisonous powder to be so applied to Florence Sarah Martin, William Ernest Mead, Eliza Sear, Alfred Harrington, and other children, and that he, well knowing the said violet powder to be poisonous, and to contain large quantities of white arsenic, caused it to be applied, whereby their bodies became distempered and their healths injured and endangered.

Mr. Poland (instructed by Mr. Barnard Thomas, of the Treasury) conducted the prosecution; the defendant was not represented by counsel.

Mr. Byfield appeared for several wholesale druggists.

Mrs. Emma Jerrett, whose child died, Mrs. Sarah Clarke, whose child also died, and Mrs. Lucy Wade, whose child became ill from, it was alleged, the use of the violet powder, gave evidence similar in character to that adduced at the two previous inquiries. Mrs. Clarke said that her child "swelled up like a bladder of water" before it died.

Mrs. a'Court, 264, Cambridge Road, Hackney, said she purchased from one of the defendant's travellers a quarter gross of violet powders, but suspecting that the powder was not right, she sold very little of it, and handed the remainder to Sergeant Roots.

The defendant said that had the witness told him her suspicions he would have been enabled to correct an error which no one regretted more than he did.

Mr. W. H. Power, M.R.C.S., Medical Inspector to the Local Government Board, and others, gave formal evidence.

Dr. Fowler, Epping, described the appearances of several children which he had attended, and on which the powder had been used. He found inflammation and ulceration about the groin.

Defendant: How many children have died?—Witness: Thirteen; but only four who were under my treatment.

Defendant: You believe they died under the use of the powder?—Witness: Decidedly.

Mr. W. Lewis, surgeon, gave similar evidence. He attended Mrs. Martin in her confinement in November, 1877. The child was born on the 21st and died on the 29th of that month. His attention was drawn to blue lines in the groin, and they gave way to ulcers. These appearances would be accounted for by the outward application of a powder containing arsenic.

What, in your judgment, was the cause of death?—Arsenical poison. I certified the cause of death to be inflammation, and there was inflammation, but I did not know the cause of it. Witness attended Mrs. Harrington whose child was born on March 13 last, and died on the 19th of the same month. He saw the child every day. Its condition was exactly the same as the other, and he certified the cause of death to be erysipelas. The outward application of powder containing arsenic would account for death. He also saw the children of Henry Brown, born on June 4 last, and died June 8; Thomas Clark, born August 15 last, and died on August 31; Charles Lawndy, born October 25, and died October 30 last; and Morris Jerrett, born February 17 last, and died on the 26th. Mr. Deacon's child was born on January 2, and he saw it.

The Clerk: That child did not die?—Witness said it did not. The symptoms of the children which died were all alike. Arsenical poisoning was the cause of all their deaths. The face of the child Jerrett was very much swollen, which was not the case with any of the others. Lawndy's child vomited.

The Defendant: How many children died?—Witness: Five.

The Defendant: And you think they died from my powder?—Witness: Yes.

The Defendant: Did you express that opinion on the certificates?—Witness: No. I described the symptoms.

Mr. Poland: The certificates will be produced at the trial.

Dr. Roberts, Buckhurst Hill, said from June 21 to July 22 last he attended the child of Mrs. Wade. There was deep discoloration in the groins, retention of urine, sickness, and diarrhœa. The child recovered. In his judgment the outward application of violet powder containing arsenic would produce the symptoms which he saw. He also attended Mrs. Nottage's baby, born November 7, 1877. He first saw the child on January 2, 1878, and he continued to attend it till February 11, when it was better. Arsenical powder would cause the symptoms.

Mr. Poland asked for the defendant to be committed for trial for manslaughter. He thought it would be sufficient to have the committal on the three cases of Martin, Sear, and Harrington. It might be that bills would be presented at the assizes with reference to the same charge in other cases. But, so far as that day was concerned, he would ask the magistrates to commit the defendant on those three cases if they thought the evidence justified that course. He would also ask the magistrates to commit the defendant for the common law misdemeanour of selling and delivering powders containing arsenic to Mr. Nottage and Miss Grout and other persons, knowing them to contain arsenic, and thereby damaging the public health.

The Defendant: I wish to understand what position I am in on this platform. Do you mean to say that you are going to commit me for trial?

The Chairman: Yes.

The depositions were then read over to the witnesses, a proceeding which occupied two hours.

In answer to the usual caution,

The Defendant said: I am innocent of this charge. As I am going to be committed for trial I reserve my defence.

The Clerk: Do you desire to call any witnesses?

Defendant: No.

The defendant was then committed for trial at the next Chelmsford Assizes, on the charges both of manslaughter and misdemeanour. He applied that he might be tried at the Old Bailey, but he was informed that the bills must be preferred at the assizes.

The magistrates said they would admit him to bail—himself in £200 and two sureties in £100 each.

The defendant said he had telegraphed to London, but he was afraid that one of sureties could not be present till Saturday.

The proceedings then terminated, and it was understood that the defendant would be locked up all night—*Daily Telegraph.*

Poisoning by Strychnine.

On Saturday Dr. Diplock resumed an inquiry at the Mail Coach Tavern, Uxbridge Road, Shepherd's Bush, concerning the death of Mr. George Turner, 63 years of age, the landlord. From the evidence taken on the former occasion, it appeared that on Thursday morning, the 30th ult., Mrs. Turner left deceased in his bed room at 8 o'clock. At about 20 minutes to 10 she sent William Higgs, deceased's stepson, up to the room, and he returned saying that deceased wanted some brandy and water. This was given him. and upon another visit shortly after, a glass with a sediment in it was found on deceased's table. A medical gentleman was sent for, and upon being repeatedly questioned, deceased adhered to a statement that he had only taken a seidlitz powder. It was found, however, that the glass contained strychnine, and that deceased died from that poison. Mr. Baker, a chemist of Notting Hill, said that deceased recently purchased about six grains of strychnine for the purpose, as he stated, of killing rats. Evidence was now given that deceased had been called upon to resign the treasurership of an Oddfellows' society, and that he had written to some relatives of his intention to commit suicide. After a protracted inquiry the jury returned an open verdict.—*Times.*

Poisoning by Oxalic Acid.

Two deaths from poisoning by oxalic acid have been recorded during the last few days. One case was that of a lance-sergeant in the Scots Fusilier Guards, stationed at Windsor, who appeared to have swallowed about two drachms. The other was that of a married woman living at Bethnal Green. In both cases the poison was self-administered.

Review.

A Botanical Note-Book, or Practical Guide to a Knowledge of Botany. By E. M. Holmes, F.L.S., etc. London: Christy and Co. 1878.

These bright May days seem provocative to a study of nature, for, passing by a *slow* express through the fen country, we could not but notice the hottonia brightening up the reed-dike in a hundred places; the hydrocharis and water lilies rising up out of their winter rest in the dark mud, the sedges and other aquatic plants rapidly approaching summer growth, every roadside station with more or less of floral decoration, the fruit trees never so full of autumn promise of produce, that we could not help feeling that whatever nature might be in her serious moods, at least she was very beautiful in the spring of the year; and that with all this flower-growth of loveliness we could not help feeling how much God too must love beauty. By the way what a pity it is that artists are not more of botanists; in the Academy this year there is a splendid figure of "The Mother of Moses" looking into a fine growth of *Arundo phragmites*, hardly found in Egypt, but such as you would see on the Thames bank or the edge of a Norfolk broad; surely the "Paper reeds by the brooks" would have been a much more appropriate vegetation. But our duty to-day is rather to praise than to cavil; indeed, in the present instance and with the book before us there seems but little need of praise. All those who have seen the most admirable and exhaustive Catalogue of the collections in the Museum of the Pharmaceutical Society, 1878, by E. M. Holmes, must have felt that it was the work of one who not only had studied his subject well, but what is also of no mean requirement to success, that he also has taken it up because his heart was in it.

The work before us is what the author professes it to be, a botanical note-book; it has a number of blank leaves between the printed matter for notes, and with two good charts which will be found of great assistance to the students. It must not be supposed that this, more than any other, is an easy and royal road to learning; happily the royal road means work, so that whilst the ten talents may be sure to succeed, the one talent *well* employed will ever command success. With the many books such as the present at hand the advantage is surely with the student, and although the difficulties of examination may increase, yet the means at the command of the student more than compensate.

This book is so tabulated and so simplified that he who runs may read and read almost as he runs. Mr. Holmes well advises that where possible wild plants and not cultivated should always be chosen for botanical examination, the growth under garden treatment is so frequently abnormal in its various parts, nature very often runs astray and so misleads by her "sports."

The work is illustrated with several well-executed woodcuts which do more to give a knowledge of the subject than many pages of letter press, the several figures are so correctly drawn that we could wish the author had more profusely illustrated his pages. In conclusion we can heartily recommend this handbook to the student as being concise yet comprehensive, and above all *correct*.

Dispensing Memoranda.

[107]. Hoffman's Anodyne.—If you have not closed your remarks upon Hoffman's Anodyne permit me to refer your readers to authorities approaching nearer the time of its introduction as a quack medicine by Hoffman, and although two of them may differ, yet there is no doubt but that the original anodyne contained a portion of ethereal oil drawn over with the last portion of the ether, and that the advance of chemical knowledge was the means of producing a purer ether. Then came the introduction of the ethereal oil in definite proportions with the spirit and ether to produce a standard for the guidance of the medical man.

My first extract is from Macquer's 'Chem. Dic.,' Paris, 1778, under the article "Ether":—"Frederic Hoffmann est un des premiers médecins, qui, sans pourtant connoitre precisement l'éther, l'ont employé comme calmant et anti-spasmodique : la fameuse liqueur minérale anodine de ce médecin, n'est-que de l'esprit de vin qui tient en dissolution une certaine quantité d'éther et d'huile douce de vitriol, et c'est à l'éther qu'elle doit toute sa vertu."

Klaproth, 'Dic. de Chemie,' Lagrange and Vogel's translation, Paris, 1810:—"Lorsque on dissout une partie d'éther dans trois parties d'alcool, on obtient la liqueur anodine. Hoffmann n'est cependent pas l'inventeur de ce medicament : la recette lui fut envoyée par un pharmacien nommé Mortmeyer. On prepare aussi la liqueur de'Hoffmann en distillant de l'acide sulphurique avec 3 à 4 parties d'alcool."

Marat and de Lens refer to the subject likewise in the article on "Ether":—"Uni à l'alcool, l'éther constitue l'esprit doux de vitriol, ou acide vineux de vitriol de quelques pharmacopées, analogue à la liqueur minérale anodyne d'Hoffman, véritable éther alcoolisé assez faible, qu'il préparait en distillant six parties d'alcool sur une d'acide sulphurique. Depuis, on a donné le nom de liqueur d'Hoffman au dernier produit de la déstillation de l'éther, préscrivant même d'y ajouter un peu d'huile douce de vin.

B. M. Atkinson.

Leeds, June 10, 1878.

[107]. Hoffman's Anodyne.—Confirmatory of Messrs. Hucklebridge and Brown's opinions, I find in Forsyth's 'Medical Dictionary' (1826), under the heading, "Sp. Ætheris Sulph. Comp.,' "A stimulating anodyne, supposed to be similar to the celebrated liquor mineralis anodynus of Hoffman." Also in Duncan's 'Edinburgh New Dispensatory' (1804), under the general heading "Sp. Æther. Vitriolici Comp." (London), the formulæ—

(1) "Take of—
Spirit of Vitriolic Ether, two pounds.
Oil of Wine, three drachms.
Mix them."

(2) "Liquor. Æthereus Oleosus; olim, Liquor Hoffmanni Anodynus, Dub.—(Oily Ethereal Liquor, formerly Anodyne Liquor of Hoffmann.)

"Take what remains in the retort after the distillation of the vitriolic ether. Distil to one-half with a moderate heat."

In Lewis's Pharmacopœia (1748) the author, after describing the mode of obtaining ether, or, as he calls it, "dulcified spirit of vitriol," advises his readers, who desire further satisfaction with regard to this affair, to consult "Hoffman's Observ. Physico-Chem., Lib. 2, Obs. 13," but he does not identify Hoffman's name with any particular preparation of Ether. Sulph. Perhaps some possessor of Hoffman's work will be able to inform us what preparation he specially recommends, but till we have evidence to the contrary I think most persons will be inclined to support the use of Sp. Æther. Sulph. Comp. instead of Sp. Æther. Sulph. when "Hoffman's Anodyne" is prescribed.

Edward H. Storey.

42, *Castle Street East, W.*

[116]. Ol. Santal. Flav.—In a pamphlet issued by Messrs. Clarke, Bleasdale, Bell and Tollington, of York, entitled 'Notes on New Remedies,' two formulæ are given for exhibiting Ol. Santal. Flav. They are extracted from the 'Medical Mirror' of 1866, Dr. H. S. Purdon:—

℞ Ol. Santal Flav. . . . . . . ℨiii.
Ess. Cinnamomi . . . . . . ℨj.
Spt. Rectif., ad. . . . . . . ℥ii.

Dose.—One teaspoonful three times a day in wineglassful of water after food.

℞ Ol. Santal. Flav. . . . . . . ℨj.
Ol. Sabinæ . . . . ℨj.
Ol. Cubebæ . . . . ℨiv.
Ol. Copaibæ . . . . ℨj.
Ess. Cinnamomi . . . . . . ℨj.

Dose as above.

John Frederick Roger.

Stockport.

[116]. Ol. Santal. Flav.—In reply to Mr. Goodwin's question as to the dose of ol. santal. flav., it may be given in from ♏15 to ♏30 on sugar, or made into a mixture, using a little mucilage and syrup with some flavouring agent, such as tr. card. co. Liquor. potassæ may be added, but it is not essential, unless indicated by the state of the bladder and urine. The oil has succeeded in some cases of gonorrhœa after cubebs and copaiba have completely failed. He might consult, with benefit, Dr. Henderson's paper in the *Glasgow Medical Journal* for April, 1865.

Henry Brown.

[117]. Tinct. Cardamomi.—When tinct. cardamomi is ordered, which is correct, to give tinct. card. sinip. or tinct. card. co. (not knowing the doctor's intention)? I should have used the simple tincture, but was previously informed that the last mixture had been of a red colour.

J. W. Barnes.

Notes and Queries.

[505]. GLUCOSE IN HONEY.—Honey consists of crystallizable (grape sugar) and uncrystallizable (fruit sugar) sugar, the latter of which changes slowly into the former. Both can be perfectly separated by treating honey with rectified spirit in which the uncrystallizable is readily dissolved. If natural honey is incinerated it yields a minimum of ash (0·01—0·05 per cent.); if glucose is admixed ash will be obtained consisting mostly of sulphate of lime, originating from the chemical agents used in manufacturing glucose, that is sulphuric acid and carbonate of lime. Of twelve samples of glucose, analysed in my laboratory, the amount of ash was 1·18 per cent.

H. W. Langbeck.

[506]. CHRYSOPHANIC ACID STAINS,—Messrs. Ferries and Co., of Bristol, send, as in answer to H. B., the following quotation from a pamphlet issued by them:—"The linen of patients who are under treatment by the ointment becomes dyed in patches of a dark purple brown colour, but does not become corroded. An old suit or two of linen should therefore be set aside for wear during the treatment. The stains may be completely removed from the linen by boiling it in a dilute solution of bleaching powder, but this of course is apt to corrode the linen more or less. The stains on the skin speedily wear off completely, so that the patient in cases where the remedy has proved successful, is soon left without trace either of his disease or of the remedy that he has employed against it."

[506]. CHRYSOPHANIC ACID STAINS can be removed from linen by using a solution of chlorinated lime.

HENRY WALDEMAR LANGBECK.

[506]. CHRYSOPHANIC ACID STAINS.—The stains produced in linen by chrysophanic acid ointment are very difficult to remove. I have tried many things but find that a solution of chlorinated lime will effect complete removal, and bleach the linen perfectly white. I enclose a small piece of stained and bleached linen. The process requires caution as to the strength of the solution used. The bleached piece enclosed is almost destroyed, and the fabric useless, owing to its friable condition. The linen was immersed for twenty-four hours in a very strong solution of chlorinated lime before the last trace was removed.

In treating stained linen all traces of grease or vaseline should be removed by washing with soap, and thoroughly rinsing the articles in clean water; then immerse them in a weak solution of chlorinated lime. The process may require a day or two, but it is better to allow plenty of time than to hurry the process, and ultimately find the articles rotten and useless, as the piece enclosed demonstrates.

HENRY BROWN.

Northallerton, June 12, 1878.

[508]. INSECTICIDE POWDER.—Can any correspondent inform me of a thoroughly good powder for destroying beetles, fleas, etc., and not injurious to animals?

G. H. D.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE PORPOSED ADMISSION OF WOMEN TO THE SOCIETY.

Sir,—Although I heartily sympathize with Mr. Hampson in his efforts to admit women as members of the Pharmaceutical Society, I do not think that the last election of Council afforded much evidence of the opinion of the voters, as on account of the extraordinary reticence of the candidates many of us who have not time to consult back numbers of the Journal really know but little of their opinions, and have to vote haphazard.

Last year I voted for most of the former members, this year for most of the new candidates, and possibly gave as intelligent a vote as others, but I cannot understand why it seems to be considered undignified for the candidates to express their views on matters pertaining to pharmacy, while in all other elections the greatest publicity is given to the views of the candidates.

I trust, however, that neither Messrs. Hampson or Wade will relax their efforts in this matter, but on all suitable occasions will introduce it until the desired end is attained, and that the unseemly haste in which the vote was taken at the last annual meeting will be carefully avoided in future. It seems to be forgotten that when the numbers were announced that those who were in favour of the admission of women, believing that a mistake had been made, called eagerly for another count, but the hasty manner in which many left prevented its being done.

I must protest against the imputations made against the women seeking admission, such as a "hankering after notoriety," an insinuation which it is to be hoped will not be repeated; the discussion ought to be confined to the merits of the case. Women have to bear insinuations enough. If her maternal instincts and the hope of a happy home lead to a frankness of conduct with young men she is a forward hussey, angling for a husband, and if she seeks to gain a honest livelihood by fairly and honourably using the talents with which God has endowed her in the sphere her own judgment approves, unless she also moves in the special sphere Mrs. Grundy deems suitable, she is "hankering after notoriety" and moving out of her place.

But Mr. Groves says it is a "cruel kindness" to "give them what they ask for." Let me remind Mr. Groves that these ladies ask no gift at the hands of the Pharmaceutical Society; they are not children, but have fairly passed the examinations of the Pharmaceutical Society, and as such are entitled as a mere matter of justice to be elected as members. Mr. Groves reminds me of a man who said that he would tolerate all men's religious views. "Toleration," I said, "I want no toleration, but claim to the fullest extent the right to think and act for myself, subject only to my maker," and I wonder the women do not ask, "Who made thee a judge and a ruler over us?" What right have we to dictate to any one, whether man or woman, how they should use the talents with which they are endowed? The question is one simply between the ladies and the public. If the ladies adopt the business of a chemist and the public buy of them, the only duty devolving upon the Pharmaceutical Society is to see that they have passed the examinations, and, having done so, it is a mean and unworthy thing to refuse them admission as members because of their sex.

But Mr. Jones says that while there are such advertisements as "Wanted a man cook, etc.," women may well wait for first openings, so that to cook, to sew, to wash, to teach, is for the present to be the end of woman's ambition. Well, these are all honourable employments, as indeed all honest work is honourable.

"Honour and shame from no condition rise,
Act well thy part, there all the honour lies,"

and when women possess the physical strength that men possess, which is evidently one requirement of the advertisers, and have the same facilities for obtaining the highest university degrees that men possess, the advice will come with a little better grace; in the meantime, those who advocate such views ought to agitate for laws to be passed compelling men to seek employment elsewhere, as they will, I am sure, be ready to acknowledge that it would be most unrighteous that women should only be allowed to work in special spheres, whilst men could compete in all. But unfair though it is, such has been men's actions in the past: they have grasped all they could, and the weaker sex has often had to struggle on amid difficulties sufficient to overmaster the strongest heart.

JAMES S. HICKS.

Looe, June 11, 1878.

THE ADVENTURES OF A LADY PHARMACIST.

Sir,—It gives me great pleasure to see how we ladies are being taken into consideration by the Council of such a Society as the Pharmaceutical. George (my husband) thinks if you succeed in putting us on an equal footing with gentlemen, it will really be the best thing either you or any other professional body has yet done for the good of the public and the elevation of the status of the Society. We tried some time ago to be doctors unfortunately, however, that was soon settled. Since I am a lady pharmacist by qualification no doubt you will like to know a little of my experience in the use of that qualification. Well, sir, after passing my examinations I took a situation with a married pharmacist; this was my first experience in the trade. Everything seemed to go on delightfully for a while, but, alas, the old story, everything must fade, and as somebody says, the brightest yet the fleetest. Such was the experience I was doomed to encounter. Whenever my employer, who was very good to me, took me out for a little recreation, such as an evening ramble; a friendly party, or country ball, there was sure to be a row with his wife; in fact such a serious affray took place on one occasion, that I had to dress his poor little head and take him to my lodgings for safety. The ultimate sequel to this state of things was, so uncomfortable had my good master's domestic affairs become through his wife making so much "fuss" about morality, that I was at last compelled to leave his hospitable roof. My second and third situations were little more favourable in their results; as usual, I managed well enough with the proprietor, but "the better half" never seemed to like me, notwithstanding the generous manner in which the remainder was continually extolling my virtues. It was about this time there was a grand ball; of course *I* was there (I often used to go with the young men at the College where I studied), so was George Lovesick, the grocer, dear fellow; I could not help admiring his gaiety; you see his mind not having been cramped by the dreary routine of a chemist's education, his spirits seemed constantly on the alert. As we were coming home together he told me what a good business he had and what exertions were being made in favour of *lady* pharmacists, so we both thought how nice it would be if I could introduce pharmacy into his other business without him being compelled to pass examinations like other people, he would be very willing (?) to nurse the children, in fact, bear them if he could, and attend to the house while I managed the pharmacy department. George also thinks that by selling patents at a little sacrifice and dispensing prescriptions at the cost of the ingredients we should be sure to do a "roaring" trade; this would be a grand elevation of the status of the Society. He of course, desires me to thank you very much for your exertions in our behalf. Now, sir, having told you a little of my history, allow me to be, Yours, etc.,

ANNIE, M.P.S., GROCER, ETC.

Prescribing Over the Counter.

Sir,—As a chemist who "prescribes over the counter" perhaps you will kindly allow me space for a few remarks on this vexed question.

I would ask those who say that a chemist should not prescribe, what they would do in a case like the following (and such case is by no means uncommon)?

On a stormy night a poor woman, whose husband perhaps has only earned seven or eight shillings during the past week, brings her child suffering, say, from inflamation of the lungs, to a chemist for advice and medicine. Two pence is, at the most, the amount of money she has available; the parish doctor cannot attend the case without a note from the relieving officer, who lives at a considerable distance, and the workhouse is about two miles from the town. Is this poor creature to be told that she must go to a surgeon, and when she says she cannot afford to do so is she to be referred to the relieving officer? Must she toil through the wet streets with her sick child in her arms, increasing its malady by the exposure, and perhaps hastening its death, because of the notion that only a surgeon must prescribe?

Should her child die, the chemist who refused his aid would be morally responsible for its death, and I question if an inquest were to be held whether he would escape censure.

Numbers of people quite as poor as the one mentioned come to me for advice and medicine, also domestic servants, who as a rule much prefer consulting a chemist to a surgeon. There are thousands of commercial clerks with large families and small incomes, who cannot afford to call in a medical man. Are all these to be refused attention?

It is all very well for a chemist, perhaps a M.P.S. by examination, who has a "West-End connection" or whose "establishment" is in same fashionable locality, to say that he will not prescribe, but hundreds of chemists in the manufacturing districts, and hundreds of surgeons also, admit that many of the poorer of the working class are entirely dependent upon chemists for medical aid.

I may say in conclusion that I have "prescribed over the counter" for the past fifty years (and that too with the knowledge and approval of the medical men in the district) and although doubtless many of your readers will put down this letter with the remark "Oh, he's one of the old school," I maintain that there is more real dignity in "using the mighty art of healing" for the benefit of those whose circumstances are needy, than in shirking the trouble of it under the plea that "to prescribe over the counter" would interfere with the medical profession. I had far rather be "one of the old school" than a "carpet-knight" presiding over a "dispensing establishment" where "no prescribing over the counter" is allowed.

M. P. S.

Adulterated Violet Powder.

Sir,—Considerable anxiety exists in the public mind at present regarding the composition of that much used article known as violet powder, caused by the disclosure of no less than thirteen deaths, alleged to be due to the use of a compound of that name, containing a large proportion of arsenic, made and sold by a Mr. King, now committed for trial.

A few days ago a box, labelled "Superior Violet Powder, for the Nursery and Toilet," was handed to me to test for arsenic. Several dozen packets had been purchased from a chemists' sundriesman here, who, I have since been informed, had them specially put up for him by a London house of respectability. When analysed it proved to be gypsum ground to a very fine powder and perfumed. It contained no trace of arsenic. I have no reason to believe that such violet powder is generally supplied throughout the country; in fact the packets bearing the name of the house in question are very different, being of the usual composition, but I know that a large quantity of this substitution has been sold here.

I have written this as there may be some doubt whether calcic sulphate can be legally sold as violet powder.

JOHN KEITH.

30, *Richmond Place, Brighton.*

The Production of the Poison Register.

Sir,—As no reply has been published in your columns to the question (as to under what circumstances we are compelled to produce our Sale of Poisons Register), which appeared in connection with the recent letters upon the alleged sale of strychnine at Penzance, and as it would be worth while for us to know our exact legal position, I venture with your permission, to revive the subject.

I think I am correct in saying that the Act does not state under what circumstances it must be produced, nor in whom the authority is vested to make such a request, neither does it specify that the poisons mentioned must not be given away.

Some time since, some "blue powder" I sold accidentally came in contact with a cat, whose owner came to me, and requested a sight of my poison book; his request was refused, when he stated he would make me show it. My reply to this strong remark was, "Then I'll wait till you make me." He soon after reappeared with a gentleman in all the glory of a blue uniform, who said, "The superintendents of police had sent him to look at my poison-book." I again refused to produce it, when he said, "They would apply to the magistrates for an order to compel me to comply with their request." I afterwards heard they did so, but the magistrates declined to do so. My opinion is they had not power to make such an order.

JOHN FACEY.

Bristol.

Remedy for the Attack of Drapers and Others upon the Patent Medicine Trade.

Sir,—Since the inroad made on this district by drapers and others selling at the ordinary cost prices, or nearly so, I have, although contrary to all my former practice, adopted the plan of putting up more patent medicines (so-called) of my own, and in every case possible, of recommending some of these in the place of the ordinary going patents, especially on the ground that I well know the contents of my own, whilst the composition of the others was not known, and some of them at least contained dangerous materials. My experience is short, but it is sufficiently satisfactory, much more than expectation, fully to convince me that if the proprietors of the ordinary going remedies will not come to some reasonable understanding with the trade not to supply these articles to persons entirely outside the business, or else, only to supply them, at, say, 10 per cent. above the trade prices; the remedy is very largely in our own hands.

Of course, a united effort will be necessary, and I would suggest, if necessary, the publication of a correct analysis of all the leading patent remedies and counter preparations being offered to the public on this basis, attested by some of the most eminent analytical chemists, omitting any objectionable ingredient. This may be done by each individual chemist, but would be more effective if these preparations were issued by a joint company of chemists, and, of course, with sufficient and legal distinction from those of present proprietors.

We should be in a position then fairly to compete with drapers, co-operatives, and others who have made inroads upon our proper business.

I presume it is well known that the object of these parties (drapers) is not really to sell for a less price than ourselves; it is, in fact, to palm a mean lie upon the public, that is, that all their other stock is sold at equally ruinous prices. They seize upon such articles of other tradesmen as have a fixed and well-known price, sell these at cost, or nearly so, and publish their own stock as selling at the same rates. This is really a dishonest way of conducting business, and any one acquainted with the value of drapery stock may easily discover that in the long run, taking one article with another, these puffing establishments get as much profit as other tradesmen, and on much of their stock, such as the public are not competent to judge of, a very much higher profit than is usually charged.

JOSEPH BALL.

Oxton.

"PATENTS."

Sir,—The letter of your correspondent "Ictus Equi' deserves to be read and studied by every chemist on the register. He strikes at the root of the evil in the course he recommends as regards the thousand and one quack nostrums with which the trade abounds, and for the existence of which it is largely responsible, in the countenance it has lent and the publicity it has helped to give to them. We as chemists have too long tolerated them, and have thereby seriously impaired our legitimate influence with the public, who might, in many cases, have been supplied with useful preparations of our own, to the advantage of both parties. The evil is, however, rapidly working its own cure, and "Patents," as a source of profit, will soon have become "a proverb and a bye-word."

The present seems a transition period, and the retailer now suffers, but the loss will ultimately fall upon the makers, who do not appear to see, that, by allowing the present unscrupulous cutting of their published prices to go on they are assiduously "working out their own extinction." However, as matters now stand, this is "a consummation devoutly to be wished," and is their own affair and not ours. We, as a body, can (if we will) sufficiently protect ourselves by at once discountenancing, in every legitimate way, the sale of these, in too many instances, useless, and now almost profitless articles, replacing them by good and sterling preparations of our own.

Given the indifference, or open hostility, of the chemists throughout the country, it becomes an interesting question how long the great majority of "Patents" would survive the shock.

EXPERIENTIA DOCET.

Sir,—As patent medicines are a familiar topic just now, it may interest other members of the trade to know what experience I have had with one.

Six months since it came to my knowledge, that a medicine was being sold in this neighbourhood by a hawker who had not a patent medicine licence. I thought at the time it was not worth while to notice this, but about a month since, as I learned that dozens were being sold weekly about here by three and unlicensed people, I wrote to the proprietor asking terms, stating there was no other licensed vendor within seven miles. In reply, I had a printed intimation that a baker and grocer in a small village two miles off was district agent, and that I was to apply to him for a sub-agency. On the following day this man called and offered to serve me. I declined on the ground of his being unlicensed, and at the same time told him his liability for breach of law. As he was very positive on the matter, and appointed another person in the place to sell for him, I wrote to the excise officer of the district, informing him of the case, gave the names of three who were selling here, and also told him that there were about 1200 (agents of an insurance company) people who were selling this medicine without a licence.

A few days after, I learned that these three had been requested to take out a patent medicine licence.

About a week since another of these three called, and asked me to lend him four bottles (I had got a supply through a London house). As he was a good customer I did so. Two days later he sent me back four bottles, but not one of them had a patent label on. I again wrote to the excise telling them that as this person had just received a 12 dozen case, there was a good opportunity to get at the wholesale vendor, who, I consider, is the most culpable, most of the retailers being ignorant of the law. I have heard no more of the matter, but presume the proprietor has been complimented by the excise for having done the revenue out of some hundreds of pounds.

Need I add it will be some time before I again acquaint the excise with what it is their duty to know.

RUSTIC.

May 20, 1878.

Sir,—I have read several of the letters which have appeared in your Journal upon the sale of Patent Medicines. Legislate as we will, when all the "trade" are not agreed it will be impossible to give universal satisfaction. I am interested in this question in more ways than one, and I see many chemists clamouring to have these patents entirely in their own hands, and I see others refusing to sell stamped or proprietary articles other then their own compounding, unless under great pressure; indeed, I came across a case the other day where a solitary chemist who had all the town to himself absolutely refused to order an article prepared by me which a friend of mine wanted. Are these the persons who are to have the sale of patents entirely in their own hands?

Chemists have the first offer of my preparations, but in all cases where they refuse to sell them, I shall whenever possible appoint a grocer or stationer as my agent, and who can blame me? People will have patent medicines. I suppose they think them safer, cheaper and better than what a prescribing chemist supplies them with, and undoubtedly many of them have those three virtues to commend them to their use.

I hope no law will be passed to check the sale of many valuable remedies; at the same time I think government should be in possession of all the recipes of these patents as a guarantee that nothing injurious is supplied to the public.

I have found patent medicines a great acquisition to a chemists' business, and I am sure they have a good profit for all the trouble they have with them. It is only a small proportion of the manufacturers who make anything handsome out of them and these have to invest a large amount of capital.

NORTHUMBRIA.

May 15, 1878.

"*Phenic.*"—We cannot supply you with the information. But see Dr. Koppeschaar's paper on the Volumetric Estimation of Carbolic Acid, in *Pharm. Journ.* for April 15, 1876, p. 821, and other papers that have appeared on the subject.

"*Minor.*"—Apply to the Secretary, 17, Bloomsbury Square, for a copy of the Regulations of the Board of Examiners.

T. Hope.—(1) Probably *Salix alba*; (2) *Rhinanthus Crista-galli.*

E. J. Wood.—It will depend upon the provision made in the Act, if it passes.

Y. J. T.—We should think so.

J. Wearing.—You would find the addresses of surgical instrument makers in the Directory, but we are not able to say which or whether any of them buy secondhand instruments.

J. Sumner.—The original document should be used.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Walker, Mr. Mea, Dr. Trimen, Mr. Gardner, Messrs. Savory and Moore, M. Déclat, Messrs. T. and H. Smith, M. Lautier, Mr. Cory, M. Blaquart, Messrs. Wilson and Co., Mr. Blackett, Mr. Burt, M. Baron-Barthelemy, M. Chapellier, Mr. Best, Mr. Clifford, M. Loret, Messrs. Carruthers and Allen, Dispenser, Vigil, G., W. F. C., J. McK.

A NEW CHEMICAL TEST FOR CARBOLIC ACID, AND ITS USEFUL APPLICATIONS.*

BY EDMUND W. DAVY., A.M., M.D., M.R.I.A.,

Professor of Forensic Medicine in the Royal College of Surgeons, Ireland.

I had the honour, a short time ago, of bringing under the notice of the Academy, and of publishing in its 'Proceedings,' a new and exceedingly delicate chemical test for alcohol, I had at the time discovered; and I pointed out some practical applications which might be made of that test. I subsequently directed attention to some further useful objects which may be obtained by the employment of that alcoholic test, which latter have appeared in the London *Pharmaceutical Journal* for last year.† I have recently discovered that the reagent which I employed for the detection of alcohol in the test referred to, viz., a solution of molybdic acid or molybdic anhydride in strong sulphuric acid, is a very delicate test likewise for carbolic, or as it is otherwise termed, phenic acid, a substance which is now one of considerable industrial importance, admitting as it does, of so many useful applications; and one for which it is desirable to have a ready, and at the same time a delicate test, for the detection of its presence under different circumstances.

I have observed that when a drop or two of a dilute aqueous solution of carbolic acid is brought in contact with a few drops of the molybdic solution stated, there is immediately produced a light yellow or yellowish brown tint which, passing to a maroon or reddish brown, soon develops a beautiful purple coloration, which latter remains without further change for a considerable time. I should here observe, that the application of a gentle heat will hasten the development of the purple reaction, though it will take place, but more slowly, at the ordinary temperature; and it is the production of this purple under the circumstances stated, that constitutes the test for carbolic acid.

The molybdic solution which I have chiefly used for this purpose is similar to the one I have employed for the detection of alcohol, and is made by dissolving, with the assistance of a gentle heat, one part of molybdic acid in ten parts by weight of pure and concentrated sulphuric acid; but the exact amount of molybdic acid dissolved appears to be a matter of indifference, as I have used other proportions with success, and in some recent experiments I found that a solution where there was only one part of molybdic acid in a hundred parts of sulphuric acid acted very well.

The mode of using this reagent is simply to add three or four drops of it to one or two of the liquid under examination, placed on any white porcelain or delf surface, when the effects already noticed will be produced if carbolic acid is present. In carrying out this test it will, however, be found the most convenient to use a small white procelain capsule furnished with a handle, which will admit of the application of heat when it may be desirable to hasten the reaction by that agent.

This test is one of great delicacy, for I have found that one small drop of an aqueous solution of carbolic acid, containing a thousandth part of its weight of that acid, and only absolutely about the one seventy-thousandth part of a grain, when mixed with three or four drops of the molybdic solution, produced immediately the yellowish brown effect, which after a few minutes passed into a very distinct and beautiful purple coloration, and this colour remained quite perceptible on the fourth day afterwards, though it had each day become fainter from exposure to the air, and its consequent absorption of moisture. But this is not the limit of its delicacy, for I have detected by its means the carbolic acid in one drop of an aqueous solution five times more dilute, or where it contained the one five-thousandth part of its weight of that acid, and in which there was only about the one three-hundred and fifty-thousandth part of a grain present.

For the success of this test it is necessary to attend to a few particulars, one of the most important being that only a drop or two of the liquid under examination should be employed, for if much more be used the reagent will be diluted too much, and the characteristic reaction will not take place; for so great an effect has water on it, that even when the purple coloration is fully developed, the addition of that substance will cause either the coloration to disappear almost entirely if the quantity of carbolic acid present be exceedingly minute, or if more abundant, it first changes the purple to red and then into a light reddish brown, which becomes more and more faint on further dilution; but the addition of a few drops of the test solution, or even of strong sulphuric acid, again reproduces the purple, though of course fainter in its colour in proportion to the previous degree of dilution; thus showing that the mixture must be very strongly acid for the production and continuance of this purple effect. Another point to bear in mind is this, that where carbolic acid itself, and not an aqueous solution of it, is acted on by the molybdic reagent, a dark olive, quickly changing to a very deep blue, will be produced, but not the purple coloration. A saturated cold aqueous solution, however, of carbolic acid when so treated will yield the purple reaction; but even here there will be a tendency to develop the olive or blue effect, especially where the reagent employed contains a large proportion of molybdic acid; and I may observe that weaker solutions of carbolic acid give more satisfactory results, as the action appears to be too energetic when the acid itself or very strong solutions are employed.

The last precaution I wish to direct attention to, for the successful performance of the test, is this, that in applying heat to hasten the reaction it should be limited to a gentle one that the hand can bear when applied to the bottom of the capsule, this being about from 120° to 130° F., which is quite sufficient for this purpose, besides not exercising any destructive effect on the purple reaction; for I may observe that if the heat be raised even to 212° F., and continued for some time, the purple coloration will be destroyed, and a blue produced. Moreover, where organic matters are present along with the carbolic acid, many of them will likewise when heated with the molybdic reagent to that latter temperature, or even much below it, develop a deep blue colour, which would mask, more or less completely, the purple effect of the carbolic acid; consequently it is better in most cases, to let the test act on the liquid at the ordinary temperature, though the reaction may be somewhat slower in developing itself.

I have made a number of comparative experiments with this test, and with the principal ones hitherto employed for the detection of carbolic acid, and I find in point of delicacy it seems only to be sur-

* Read before the Royal Irish Academy, May 13, 1878.

† *Pharmaceutical Journal*, September 15, 1877.

passed by the bromine test of Dr. Landolt, which depends on the circumstance that when an aqueous solution of bromine is brought in contact with carbolic acid, there is immediately formed the tribromophenol ($C_6H_3Br_3O$), a sparingly soluble white substance; but that test could not be successfully employed, at least immediately, in many cases where the test just described might be still available; as, for example, in the case of different organic mixtures, where the presence of the tribromophenol formed would be concealed. It possesses likewise the great advantage of being apparently not interfered with, to any extent by the presence of a number of organic substances which obscure or prevent the reactions of many of the other tests.

As to what is the exact nature or composition of the purple compound which is formed in carrying out this test, I have not yet been able to determine, owing to the difficulty of isolating it, or of obtaining it in a condition suitable for analysis; but I am inclined to think that it is not so much an oxidation product of carbolic acid, as a deoxidation one of molybdic acid, and that it is a combination of one of the oxides of molybdenum, containing perhaps more oxygen than the blue compound which is formed where the molybdic reagent acts on alcohol, and on some other substances; and one circumstance, amongst others, which seems to support this view, is this, that I have failed to obtain by the action of other oxidizing agents on carbolic acid a similar purple reaction.

Be this, however, as it may, I have satisfied myself that the purple compound formed in my test is a totally different substance from the red or crimson dye, termed coralline, which is obtained by the united action of oxalic and sulphuric acids on carbolic acid, and is now largely used as a dyeing material, for the red colour of the latter substance is not affected by the caustic alkalies, and strong sulphuric acid changes it to a reddish-yellow; whereas the purple developed in the new test is changed to green by caustic alkalies, and the purple again restored by strong sulphuric acid. I am, however, still engaged in this inquiry, and hope to be able yet to determine the exact nature of this purple compound, and of the changes which occur in this new reaction.

I shall now briefly notice some of the useful applications which may be made of this test.

It is well known that carbolic acid is a powerful poison, and many instances are now on record where it has been the cause of death, such being generally either cases of suicide or those where it has been accidentally taken by mistake for some other substance, as its odour and taste would render its administration, at least to an adult, by the assassin for the criminal destruction of life a matter of some difficulty. The occurrence, however, from time to time of the cases referred to, obviously renders it very desirable to be able readily to detect the presence of carbolic acid, where it has been so used, either in the articles of food, drink, or medicine, which have been taken, or in the ejecta, or contents of the stomach; and this test affords a very easy and ready means of so doing, and of confirming the indications of other tests. According to my observations it will detect the presence of carbolic acid in different complex organic mixtures, even when the odour of that substance may be quite imperceptible; and I may observe, that this test of odour, has hitherto been regarded as the most delicate for carbolic acid in such cases. The great advantage this test possesses, especially for such applications, is this, that it does not appear to be much affected or interfered with, as already stated, by the presence of a number of organic substances which are likely to be present in such cases. Thus as regards different articles of food, I have readily detected, by means of this test, the presence of carbolic acid when a small quantity of its aqueous solution had been added to the following articles, viz:—tea and coffee mixed with sugar and milk, porter*, ale, wine, a solution of Liebig's extract of meat, and albumen; also where it had been added to blood, olive oil, gum, and soap, the very diverse substances in the articles mentioned not preventing the indications of the test.

It will also afford a ready means of detecting the elimination of carbolic acid in urine, when that substance has been taken internally, for the compounds present in human urine naturally do not appear to affect to any extent this test. I may also observe that with it I was at once able to detect the presence of carbolic acid occurring in the urine of a cow without any previous treatment of that secretion, and thus to confirm the correctness of the statement as to the occurrence of that acid as a normal substance in the urinary secretion of that animal. This ready means, therefore, of discovering carbolic acid in different animal fluids where it may exist, will render the test useful to the physiologist and physician.

Another useful application of this test, is that it affords a very ready means of distinguishing creasote from carbolic acid, which is a matter of some commercial importance, for much of what is sold as creasote is, as is well known to chemists and those in the drug trade, little else than carbolic acid; for those two substances, though obtained from different sources,—true creasote being procured from the distillation of wood tar, whilst carbolic acid is got from that of coal tar, and though they differ likewise from each other in chemical composition—still so closely do they resemble each other in several of their properties that the cheaper substance, impure carbolic acid, is in whole or in part frequently sold to the public for the dearer article, creasote. If, however, we take a drop or two of each and agitate them well with about a quarter of a fluid ounce of distilled water, and having filtered the liquid, test a drop or two with the molybdic solution as already described, we shall get in the case of pure creasote only a brown or reddish brown reaction, which on standing, or warming slightly, becomes fainter, passing to a light yellowish brown, whereas in the case of carbolic acid, the brown passing to a maroon soon develops a more or less intense purple colour. This treatment will be sufficient to distinguish creasote from carbolic acid,

* As alcohol acts on the molybdic solution producing an intense blue coloration, the presence of that substance, at least in any quantity, would mask more or less completely the reaction of carbolic acid; in examining, therefore, alcoholic liquors for that acid, it is better to submit them to distillation to separate the alcohol, and then to test the later portions of the distillate or the residue for carbolic acid; or what answers even still better in such cases, is to render the liquid alkaline by the addition of either caustic potash or soda, to combine with and fix the carbolic acid, and then distil; and when all the spirit has been removed, to add diluted sulphuric acid to slight acid reaction to liberate the carbolic acid, and after this distil again, when that acid will come over unmixed with any spirit, and give its characteristic reaction.

and also to detect the presence of that acid in creasote, where it occurs in considerable proportions; for if on the addition of the molybdic test solution, the mixture instead of fading away to a light yellowish brown on standing a short time, or on gently heating passes to a reddish-brown or to a maroon, it is an indication that carbolic acid is present. But I have found that the following very simple proceeding gave more satisfactory results, especially where small quantities of carbolic acid had been added to a large proportion of creasote. From five to ten drops of the liquid under examination are taken and agitated briskly with about half an ounce of distilled water for a few minutes, so as to dissolve out the carbolic acid; the mixture is then filtered and the filtrate is put into a little flask furnished with a close fitting cork, through which passes a small glass tube about ten or twelve inches long and bent above the cork at a little more than a right angle. The contents of the flask are then heated, and when the liquid boils, the first portions which distil over will be found to present a more or less turbid appearance as they pass down the tube, from their containing minute globules of creasote, and a drop or two having been collected and tested with the molybdic reagent will give only the brown reaction of creasote; but by continuing the boiling that substance will be more or less completely expelled, and then it will be found that a drop or two of the later portions of the liquid which distil over will give the purple reaction of carbolic acid. I may here observe that as it is only a drop or two of the distillate which is required each time for testing, it is not necessary to use any condensing arrangement, for the vapour, passing through the tube itself, is cooled sufficiently to furnish the small quantity required for each trial; but when it is desirable to collect in larger quantities the different portions of the distillation, a very small Liebig's condenser in which the delivery tube can be inserted will be found the most convenient arrangement to employ. In this way by distillation I was enabled to detect the presence of carbolic acid in creasote, where I had mixed only one part of the former with a hundred parts of the latter, which would be more than sufficiently delicate for any case likely to occur in commerce, for where such adulteration was practised it is probable that a much larger proportion of carbolic acid would be used to render the fraud sufficiently remunerative. In the same way I have readily succeeded in detecting the presence of carbolic acid in the oil of cloves, where I had purposely added a small proportion of that acid, as it is stated that this very objectionable fraud is occasionally practised of adulterating the essential oil of cloves with carbolic acid.

Those few applications that I have referred to are, I should trust, sufficient to indicate the practical utility of this test, which, being at the same time so simple and easily performed, will be found, I have no doubt, useful for the objects stated, as well as for others to which it may be applied.

PELLETIERINE, AN ALKALOID OF POMEGRANATE BARK.*

BY M. TANRET.

It is usually recognized that the bark of the pomegranate, both stem and root, is active as a febrifuge in the fresh state, whilst that after drying and being kept some time it loses part of its virtue. The most natural explanation of this difference of action would perhaps be that the active principle of this bark is very liable to alteration. In previous researches, however, no such body had been met with, but the author has been successful in discovering in the bark a volatile alkaloid, which he has recently brought under the notice of the Academy of Sciences. This alkaloid he proposes to call "pelletierine," in honour of the learned man who contributed so largely to the history of the alkaloids.

In preparing pelletierine pomegranate bark (from the stem and roots) is reduced to a coarse powder; this is moistened with tolerably thick milk of lime, and afterwards lixiviated with water, and the liquor vigorously shaken up several times with chloroform. The chloroform is then separated by means of a funnel having a stop-cock and shaken with sufficient acid to render it neutral or slightly acid. In this way solutions of sulphate, hydrochlorate, nitrate, etc., of pelletierine can be obtained, which may be crystallized by evaporation in a vacuum over sulphuric acid. To isolate the alkaloid it may be set free by treating the saline solutions with carbonate of potash and agitating with ether or, better still, chloroform. The ethereal or chloroform solution then being distilled at a gentle heat the alkali is left as a residue.

One kilogram of dry commercial bark yielded to the author by this process four grams of crystallized pelletierine sulphate. With fresh bark the yield would probably be greater.

Pelletierine is of an oleaginous consistence and is colourless when obtained by evaporation of its ethereal or chloroformic solution in a vacuum, but when the solution is distilled in the open air the alkaloid becomes slightly yellow. A match dipped in pelletierine burns like one saturated with an essential oil.

Pelletierine is volatile, and has a slightly stupefying aromatic odour. It gives off vapour at the ordinary temperature, and the oil spots that it forms on paper disappear after exposure to the air for a short time. It boils at about 180° C., becoming strongly coloured in the air, but it commences to distil at a much lower point. The alkaloid is very soluble in water, alcohol, ether, and especially in chloroform, which readily removes it from aqueous solutions.

Pelletierine is a powerful alkali, saturating acids to form salts. Upon bringing near to it a rod dipped in hydrochloric acid white fumes are formed as with ammonia. It does not precipitate solutions of the metals of the earths and alkaline earths, but it does precipitate solutions of most of the true metals. Thus it gives a white precipitate with salts of lead, mercury, zinc, and silver, the last two being redissolved in excess of pelletierine. With nitrate of cobalt and with sulphate of copper it gives blue precipitates which are not redissolved in excess. It does not precipitate chloride of platinum, but it precipitates the chlorides of palladium and of gold, the last precipitate being reduced by heat. Further, like other alkaloids, it is precipitated by tannin, bromine water, iodo-iodide of potassium, iodide of mercury and potassium, iodide of potassium and cadmium and phosphomolybdic acid. The precipitate formed with tannin is soluble in an excess of the reagent; that formed with bromine water is soluble in an excess of pelletierine.

The author has prepared the sulphate, hydrochlorate and nitrate of pelletierine in crystals. These

* *Comptes Rendus*, vol. xxxvi., p. 1270.

salts are extremely hygroscopic. Obtained by evaporation of their solutions in a dry vacuum they are colourless. If the neutral solutions are evaporated in a stove they become coloured yellow, and at the same time by loss of part of the base they acquire an acid reaction. The salts have a slight odour, and their taste is bitter and aromatic.

THE TURPENTINES AND RESINOUS PRODUCTS OF THE CONIFERÆ.

BY DR. JULIUS MOREL,

Professor of Chemistry in the Industrial School, Ghent.

(*Continued from page* 984.)

XX. GUM SANDARACH.*

Synonyms.—L.: Vernix; Juniperi lacryma; Serapioni Sandarax seu Sandaracha; Sandaracha album; Sandaraca vera*; Resina Juniperi; Sandarus.—E.: Sandarach; Juniper Resin; Gum Juniper; Pounce (in powder).—F.: Résine Sandaraque. —G.: Sandarac.

Botanical Origin.—Callitris quadrivalvis, Vent.

Cupressus fructu quadrivalvi, foliis Equisetis, ad *instar articulates*, Shaw, Afr., no. 79 (*cum ic.*).
Thuja articulata, Vahl, Symb., ii. 96, t. 48; Desf., Fl. Atl., ii. 353, t. 252; Hist. Arbr., ii. 576; Loisel, Nono. Duham., iii. 15, t. 5.
Frenela Fontanesii. Mirb., Mém. Mus., xiii. 74.
Cupressus articulata, Forb., Pinet. Wob., 191.
Callitris quadrivalvis, Vent., Nov. Gen. Decad. 10; Rich., Conif., 46, t. 8, f. 1; Loud., Encycl. of Tres, 1072, f. 1995; Spach, Hist. Vég. Phan., xi. 344; Endl., Syn. Conif., 14; Carr, Man. des Pl., 320; Tr. Gén. Conif., 81; Gord., Pinet., 38 (excl. *Thuja inæqualis*).

Formerly it was alleged that sandarach was yielded by a large variety of the common juniper (*Juniperus communis*) or oxycedrus (*Juniper oxycedrus*); but Schæsbœ, a Danish traveller, asserts that the common uniper does not grow in Africa. The error can only be explained by supposing that the *Callitris quadrivalvis* had been mistaken for a juniper.

The *Callitris quadrivalvis* is a plant that does not attain a large size. It is met with abundantly in the mountains of North-West Africa, in Algeria and the Atlas region. The product comes to us principally from Morocco, by way of Mogador and Cairo.

Extraction.—Sandarach exudes naturally through the bark of the stem. Nevertheless in every place where the collection of the resin is now carried on incisions are made in the stem and especially in the lower part of it. The proportion of resinous juice exuding under these conditions is much larger. The juice hardens rapidly upon the plant.

Characters.—Sandarach occurs in commerce under the form of grains or tears, the tears being generally much elongated. Some pieces have a length of 2 to 3·5 centimetres, but the greater part do not exceed 0·5 to 1·5 centimetre. The tears are usually cylindrical, rarely pyriform, most frequently separated, but sometimes agglutinated together to form a plaited mass. In colour the resin varies from pale yellow to pale red-brown. The best sorts consist of picked tears having a beautiful yellowish tint, and very clear and transparent. The surface of the tears appears to be covered more or less with powder, but this character is not to be attributed, as alleged by Herlant,* to the friction of the fragments one against another, but as has been ascertained by a microscopical examination by Dr. Julius Wiesner,† to the unequal contraction of the resin while drying, resulting in a mass of fissures that form, as in the case of several kinds of copal, facets that gradually separate from the mass and constitute the "powder" of many authors.

Sandarach is slightly harder than mastic (the resin of *Pistacia lentiscus*); it scratches that substance, as well as mica. Its hardness corresponds to that of copal kauri. At the ordinary temperature it remains hard, but at 100° C. it softens, and about 150° C. it melts and swells.

According to Brisson the specific gravity of sandarach is 1·092; Pfaff gives it as 1·09, and Flückiger as 1·066. Its fracture is clean or slightly curved, and the surface of the fracture is always shiny. At the ordinary temperature the odour is very weak, aromatic, and terebinthinate; but it becomes more pronounced upon heating the resin.

This resin does not soften in boiling water. It is completely soluble in alcohol and in ether, and the ethereal solution treated with alcohol does not become turbid. The alcoholic solution treated with acetate of lead gives a precipitate that is not completely redissolved at the boiling temperature. The same alcoholic solution treated with ammonia remains clear. Sandarach is slightly soluble in chloroform. A saturated alcoholic solution of hydrochloric acid and also sulphuric acid colour the resin dark brown; nitric acid colours it pale brown. Further, sandarach is partially soluble in benzol, rectified petroleum, and oil of turpentine; caustic soda and acetic acid do not exercise any action upon it; it is very slightly in carbon bisulphide and boiling linseed oil; and under the action of ammonia it swells and afterwards dissolves.

Alcohol, ether containing alcohol, and ether dissolve sandarach completely, the solution giving with acetate of lead a voluminous precipitate, which is not dissolved by boiling. Ferric chloride colours the alcoholic solution greenish-brown; ammonia gives with the same solution a clear liquid. It is slightly soluble in chloroform, and the bromine test is decolorized by the chloroformic extract. A saturated alcoholic solution of hydrochloric acid dissolves it with a brown colour; concentrated sulphuric acid dissolves it with a yellow-brown colour, the solution becoming turbid upon the addition of alcohol or water. Solution of carbonate of soda colours it yellow at the ordinary temperature; when heated to boiling it dissolves a great part of the resin. If this solution be treated with acetic acid the resin separates in the form of flocks. With chloride of calcium no reaction is obtained. Hirschsohn failed to detect in sandarach the presence of nitrogen, sulphur, cinnamic acid or umbelliferon. The solution in petroleum spirit was colourless; it coloured solution of iodine violet-red without producing the least turbidity. The residue from the evaporation of the solution in petroleum spirit presented no reaction with chloral hydrate. Sulphuric acid and Fröhde's reagent dissolved this residue with a citron yellow colour, the edge of the solution becoming rose.

Sandarach occurs in commerce under two forms:

* Herlant states that according to Dodonæus the name "Sandarach" was applied by the ancients to three different substances: one the subject of this notice; the second realgar; the third, known under the names "cerinthus" and "erithæa," was used to feed bees whilst working. The cerinthus was the plant now known as *Cerynthus major*, L.

* 'Etude sur les Produits Résineux de la Famille des Conifères,' p. 38.

† 'Die chemisch-technisch verwendte Gummiarten, Harze und Balsame,' 1869, p. 129.

the first, presenting all the characters above described, is sold as "picked sandarach" (*sandaraca electa*); the second, common sandarach (*sandaraca in sortis seu naturalis*) is met with as dark coloured but transparent tears, mixed with much impurity, such as earthy and ligneous particles.

Chemical Composition.—Sandarach is composed of three different resins. Resin α ($C_{40}H_{62}O_5$) is soluble in 60 per cent. alcohol, in ether, and in oil of turpentine; the alcoholic solution reddens blue litmus. Resin β ($C_{20}H_{31}O_3$) is soluble in absolute alcohol, in ether, and in oil of cumin; it is insoluble in rectified petroleum and in oil of turpentine. Resin γ ($C_{20}H_{30}O_3$) dissolves in absolute alcohol, and in ether of 87 per cent., but is insoluble in volatile oils. Undervorben has isolated these three resins in the following manner. Sandarach was dissolved in absolute alcohol and the solution treated with caustic potash; a precipitate was formed which was a combination of resin γ with the potash. The supernatant liquid separated by filtration was treated with hydrochloric acid, which caused a precipitation of two other resins. These were washed and dried and then treated with boiling 67 per cent. alcohol, which dissolved the resin α and left the resin β intact. The potassic combination of resin γ, treated with hydrochloric acid, yielded a precipitate of the pure resin. It has not yet been demonstrated that the odour of sandarach resin should be attributed to a particular essential oil; such an oil is believed to exist in fresh sandarach, but the product occurring in the drug warehouses certainly does not contain it. Submitted to distillation sandarach yields an empyreumatic liquid, resembling the product of the distillation of amber, and the aqueous portion of which contains acetic acid and succinic acid.

Adulterations.—Sandarach is frequently substituted for mastic, but they may be distinguished by the mastic crackling and softening under the teeth, whilst the sandarach fractures clean. Further, mastic occurs in rounded and transparent tears, and dissolves completely in ether and oil of turpentine, and incompletely in cold alcohol; whilst sandarach resin is completely soluble in alcohol, and incompletely soluble in ether and oil of turpentine.

It has also been alleged that sandarach has been often adulterated with pieces of gum arabic; but Wiesner, who has devoted considerable attention to the examination of this product, has never met with any traces of such admixture.

Uses.—According to Gubler the Arabs used sandarach resin as a remedy against diarrhœa, and to lull pain in hæmorrhoids. The Chinese* employed it as a stimulant in the treatment of ulcers (as promoting the growth of flesh), as a deodorizer, and to preserve clothes from the attacks of insects. In Europe it is used very little in medicine. It is most frequently employed as an ingredient in varnish, to increase its hardness and glossiness. It is used also as a fumigant, and in powder to dust over paper of which the surface has been scraped, in order to prevent the ink from running. Rarely it enters into the composition of plasters.

With sandarach resin may be connected another resinous substance that was exhibited in the Paris exhibition of 1867, from South Australia, under the name of "pine gum."* It is the resin of *Callitris Reissii*, Miq. (*C. robusta*, R. Br.; *Frenella robusta*, Cunningh.) This product resembles sandarach, and might become an important article of commerce. Mitchell states that the plant is met with in the sub-tropical parts of New Holland. Reiss has met with it at Rocky Bay and Woodman's Point, and Baxter has found it in King George's Sound. This resinous substance occurs under the form of slightly yellowish tears, thicker and longer than those of ordinary sandarach. In consequence of unequal contraction it presents, like sandarach, numerous facets, and consequently the surface appears to be covered with a white powder. By examining this resin under the microscope Wiesner ascertained that the finer fissures were derived from the larger ones. In its transparency and hardness the resin of *Callitris Ressii* corresponds to sandarach. Its odour is very agreeable and balsamic, and its taste is bitter and aromatic.

(*To be continued*).

* According to Soubeiran, 'La Matière Médicale chez les Chinois,' 1874, p. 134, "This sandarach would be yielded by the *Callitris sinensis*."

* Dr. Julius Wiesner, *loc. cit.*, p. 133.

THE CITRIC ACID MANUFACTURE IN THE UNITED STATES.†

BY A. C. WEHRLI, PH.G.

The use of citric acid in medicine and pharmacy is well established; although there are not many salts and preparations of citric acid officinal, some of them are very extensively used. The use of this acid at present as a refrigerant is indicative of the time when the acid in the free state was not known, and man used it as nature gave it for a refreshing drink from the juices of fruits, in which condition only was it known till the knowledge of chemistry liberated it to enjoy a wider range of usefulness. Citric acid takes precedence over many others for the introduction of inorganic substances to the human system, such as iron, bismuth, magnesia, etc., because of its vegetable origin, and easy assimilation by the system, and thus do vegetable substances become mediators between the animal and mineral kingdoms, a process pre-eminently employed by nature in the elaboration of animal tissue in which inorganic elements enter, a process man is not slow to imitate in the administration of medicines. Being of vegetable origin, and so extensively used, the possibility of its being poisonous is seldom considered by many; that such is the case is held by high authority, when taken in large quantities, its effects then being similar to oxalic acid, it causing a softening of the tissue with which it comes in contact, although no conclusive evidence exists regarding such an action on the human system. We are led, however, to believe that such might be the case, when we observe the peculiar effect that even a small quantity has on some persons, causing severe headache, etc. Its distribution in the vegetable kingdom is very extensive, so much so that we are surprised at the comparative high price of the manufactured article, when it is known that annually tons of the fruits, such as limes, lemons, and sour oranges, go to waste in the countries which produce them, not only in Italy and Sicily, but in the southern part of the United States, where they are now so extensively cultivated, as in Florida and Mexico. It was probably from this fact that the manufacturing firm of Powers and Weightman have of late availed themselves of the opportunity to utilize the damaged fruits (the result of windfalls, etc.) which are grown in that country, thereby stimulating a new enterprise in the South, for which they received a medal, which was awarded May 12, 1875, by the Franklin Institute of Philadelphia—"For the introduction of an industry new in the United States, and perfection of result in product obtained in the manufacture of citric acid."

† An Inaugural Essay presented to the Chicago College of Pharmacy. From the *Pharmacist*, May, 1878.

Although citric acid is not made exclusively from fruits grown in this country, its manufacture from this source seems to compare favourably with that from Italy and Sicily. At the Centennial Exposition of 1876, at Philadelphia, were exhibited lime, lemon and sour orange juices, both from this country and Europe. The juice is prepared by pressing the fruit in the same way as apples for cider, and then concentrated in copper boilers to one-sixth its original volume, and shipped in vessels containing about 120 gallons. As thus shipped, they are dark brown, syrupy liquids, with specific gravities ranging from 123 to 128, containing from 28 to 32 per cent. by weight of acid. The object of concentrating the liquid is obvious, not only to lessen the cost of shipping, but to prevent decomposition, which a dilute solution is prone to. The source of citric acid then is almost exclusively from the juice of the lime, lemon and sour orange. Some other fruits contain it also in large quantities, but still not in paying ones. The fruit of *Sambucus racemosa rubra*, or red elder berry, growing sparingly in this country, has been proposed in France as a source for this acid. One hundred pounds of currants or gooseberries yielding one pound of citric acid, being just one per cent., its production from this source could never be feasible, as its abstraction from these would entail the use of more complicated processes and apparatus, on account of containing other acids. The fruit of *Viburnum macrocarpon*, or large American cranberry, is probably consumed to a greater extent in this country than any other acid fruit. On account of its flavour, agreeable acidity, and property of forming jellies, its cultivation in this country has assumed large proportions, an interest rather monopolized by the North-west, especially Wisconsin and Minnesota, where vast marshes are literally covered with it. Requiring no care or attention, it grows spontaneously, and yearly the picking affords employment to a large number of people. There are two species of this genus yielding acid fruits, *Vaccinium oxycoccus*, or small cranberry, and the *V. macrocarpon*, or large American cranberry; both are perennial trailing herbs. The fruit of the former is never used, that of the latter is, and is distinguished in the market by names suggested by its shape, as bell, bugle and cherry cranberry. That its fruit can be developed on soil where nothing else can is explained by the fact that the berries contain, according to Prof. Horsford, besides 88 per cent. of water and 11 per cent. of woody fibre and acids, only 17-100 per cent. of inorganic material; requiring, therefore, little for their development but air and water. Although requiring little or no care in their production, it would still not pay to use them as a source for this acid, because commanding such a high price as an article of food. Judging from some reports, it would require but the shadow of a cranberry marsh to become wealthy. For the sake, however, of determining the amount of citric acid in these, as compared with an equal quantity of limes, lemons, and sour oranges, they were subjected to the following examination. Of course, the amount of citric acid in the limes, lemons, and sour oranges, as found in this market, and indeed everywhere, is never constant. Especially is this the case with sour oranges, which gradually lose their sour taste, becoming sweet. Lemon juice enters into several officinal preparations as mistura potassa citratis and syrupus limonis. The small deviation in strength is of no importance:

Table of Results.

	Citric Acid in 1 f. ounce.	Citrate of Calcium, 1 pound.	Represents Citric Acid.	
Cranberries .		72 gr.	56·6 gr. =	0·80 per ct. of fruit.
Lemons . .	34·74 gr.	300 ,,	236 ,, =	3·37 ,, ,,
Limes . . .	30 ,,	326 ,,	256 ,, =	3·65 ,, ,,
Sour Oranges.	10 ,,	128 ,,	100 ,, =	1·43 ,, ,,

To determine the amount of acid in cranberries, the acidity of one pound was exhausted with water evaporated to a low bulk and pectinaceous matter precipitated with alcohol, the filtrate freed from alcohol by evaporation, and then diluted with water, and exactly neutralized with sodic hydrate, to this was added an aqueous solution, chloride of calcium, giving no precipitate in the cold, indicating the absence of tartrates; on boiling, however, the characteristic precipitate for citrates was obtained; the resulting citrate of calcium was collected on a filter, and to the filtrate was added strong alcohol and a little calcium chloride, giving no precipitate, indicating the absence of malates, malate of calcium being soluble in water, but not in even a very dilute alcoholic liquid; the precipitate of calcium citrate, purified by dissolving in solution chloride of ammonium, from which it is precipitated on boiling, dried, and weighing 72 grains. On consulting the chemical formula of calcium citrate ($Ca_3\,2C_6H_5O_7\,2H_2O = 534$) it is found that 72 grains will yield 56·6 grains citric acid, being 0·8 per cent. of the weight of fruit used.

The absence of every other acid but this was surprising, especially the absence of malic, which is seldom absent from acid fruits; therefore this acid was separately tested for by other processes, with the same result.

From this it would seem that the cranberry, like the lemon, is one of the few acid fruits containing only citric acid. The amount of citric acid in the other fruits was determined as above; an equal weight of lemons, yielding 300 grains of calcium citrate, equivalent to 236 grains of citric acid, being 3·37 per cent. of the weight of the fruit. The same weight of limes yielding 326 grains of calcium citrate, equivalent to 256 grains of citric acid, or 3·65 per cent. of the weight of the fruit. Sour oranges yielding 128 grains calcium citrate, equivalent to 100 grains of citric acid, or 1·43 per cent. of the weight of fruit. Although limes, as a general thing, contain the largest amount of citric acid, when equal weights of the fruits are taken, still in equal bulks of the juice it contains less than lemons, as was found when tested by acidemetry. Using the volumetric solution of hydrate of sodium, limes, lemons, and sour oranges were found to contain, respectively, 30, 34·74 and 15 grains of citric acid to the fluid ounce of juice.

The process employed for the manufacture of citric acid is essentially that used by Scheele, its discoverer, almost a century ago, *i. e.*, that of throwing down the citric acid as insoluble calcium citrate, and decomposing this with sulphuric acid, liberating citric acid, which is filtered off from the insoluble calcium sulphate, evaporated and crystallized. When made on a large scale, leaden vacuum pans are used for concentrating the acid solution, thus avoiding the high heat to which the acid would otherwise be subjected, which would result in the decomposition of some acid into other products.

Up to within two or three years the American market was wholly supplied from English manufacturers, who manufactured it exclusively from Sicilian lemon juice. At present the home product is fast superseding the English acid in this market, and has had the effect of considerably reducing the price from an average price of 1·15 dollar, as it was five years ago, to 70c., as it is to-day. Both the English and American acids being made by the same process, little difference could exist as to their purity; but as the acid, in different states of purity, is extensively used in calico printing, some of this might easily find its way into the drug market.

The comparative purity of citric acid is seldom doubted, yet the British Pharmacopœia includes a number of tests for its purity, the impurities, if any, being tartaric acid, sulphuric acid, slight traces of copper and lead, the tartaric acid being an intentional adulteration; the sulphuric acid being that retained by the citric acid in process of manufacture, which causes the crystals to absorb moisture on exposure to air, by which fact its presence can be recognized; the slight traces of copper or lead being from the vessels in which it is evaporated. Although not attacking these metals at ordinary temperatures, at elevated temperatures a small portion is liable to contaminate them.

To determine if these impurities are present, six samples of both English and American manufacture were subjected to the following tests: One ounce of each of the acids was separately dissolved in four fluid ounces of water, then made nearly neutral with solution of sodic hydrate, the solution concentrated, a small quantity of alcohol added, and then a concentrated solution of acetate of potassium. Tartaric acid, if present, would then have been precipitated as acid tartrate of potassium (cream of tartar), but from no solution was a precipitate obtained, indicating the absence of tartaric acid. 240 grains of each were then separately dissolved in four fluid ounces of water, neutralized, and the solution treated with neutral acetate of lead so long as a precipitate was formed, the supernatant liquid poured off, and the precipitate boiled with dilute nitric acid, in which it was soluble, with the exception of the faintest trace, proving the absence of sulphate. For the detection of lead, the aqueous solution was treated with H_2S. In every case a black discoloration was produced, which on standing produced a black precipitate; this, when treated with nitric and then sulphuric acid yielded, on evaporation, after heating thoroughly, a white precipitate, insoluble in acids, weighing but the fraction of a grain, being the sulphate of lead from eight troy ounces of citric acid.

This proves to my mind that citric acid is quite pure; that it is so will be more satisfaction to some, probably, than had many impurities been found.

MATÉ, OR PARAGUAY TEA.*

BY ALONZO ROBBINS, PH.G.

Ilex Paraguayensis, Yerba Maté, or Paraguay tea, is a small tree belonging to the family of the Celastrineæ. Under the name of maté the prepared leaves of this tree have been employed as a beverage in South America from the earliest period, and in some portions of that country even now, to the almost entire exclusion of China tea. Maté having attracted considerable attention in Europe within the last few years, the writer embraced the opportunity afforded by the Centennial Exhibition to obtain authentic specimens, which were exhibited by the government of the Argentine Republic, and furnished by the provincial commission and private individuals of the province of Corrientes and the adjoining territory of the Missions in that republic. Although maté is but little known and of comparatively small importance in the United States, its immense production and use in South America render it deserving of greater attention that has been hitherto given to it. As several papers more particularly referring to its general use and commercial importance have been recently published, the direction of this paper will be principally confined to its proximate composition and the difference therein which the several samples mays how.

According to Dr. Mantegazza, maté is prepared as follows: The entire trees are cut down, and the small branches and shoots are taken with the leaves and placed in the tatacúa, a plot of earth about six feet square, surrounded by a fire, where the plant undergoes its first roasting. From thence it is taken to the barbacúa, which is a grating supported by a strong arch, underneath which burns a large fire; here it is submitted to a particular torrefaction, determined by experience, which develops the aromatic principle. Then it is reduced to a coarse powder in mortars formed of pits dug in the earth and well rammed. It is next put into fresh bullock skins, well pressed, and placed in the sun to dry. Other writers have given accounts of its preparation differing in the minor points, but all agreeing in the main.

The following is a description of the samples and their history so far as it was possible to ascertain it:

No. 1. Exhibited by M. Vera; packed in bag made of wolf skin, weight about 4 kilos, colour bright greenish-yellow, odour not as aromatic as some of the other samples, almost entirely free of twigs, and appears to have been prepared from very young leaves dried with little if any artificial heat.

No. 2. Exhibited by T. B. Appleyard; size of package and general appearance and character of this sample very much like No. 1.

No. 3. Exhibited by I. Arrillaga; weight about 8 kilos, packed in the entire skin of a tapir; this maté was rather coarse, containing many twigs, some of which were charred slightly; colour a dull browish-green, odour very aromatic and balsamic. This sample is believed to have been prepared by the Guarani Indians of the northern part of the Missions.

No. 4. Exhibited by the Provincial Commission; weight 15 kilos, packed in the entire skin of a tapir, general appearance and character of this sample like No. 3.

No. 5. Exhibited by the Provincial Commission; weight 10 kilos, packed in the entire skin of an animal. This sample was very unevenly powdered, and much of it quite coarse; it also contained a large proportion of twigs somewhat charred, and much sand; in colour it resembled No. 4; the odour was also similar to that sample, but much weaker; its general appearance indicated the most primitive mode of preparation. This sample was from the department of Itaty on the Parana.

No. 6. Exhibited by the Provincial Commission; packed in small skin bag, weighing 3 kilos. This maté was coarsely powdered, very dark in colour, odour quite aromatic and balsamic, and contained many fruits and twigs. It was also from Itaty.

No. 7. Exhibited by the Provincial Commission; packed in skin bag, weighing 65 kilos. This maté was finely powdered, of a bright colour, aromatic odour, and contained only a small proportion of twigs. This sample was from the northern part of the territory of the Missions, which furnishes the most celebrated maté. This territory is formed by that part of the extinct empire of the Jesuits, which was inherited by the Argentine Republic. Among the forest trees which grow admirably in the Missions that which produces the Yerba Maté merits a special mention. Near the river Uruguay it forms extensive forests, which are the source of a most important industry, whose principal centre is in the Villa de San Xavier.

The appearance and character of the samples indicate that there are at least three sorts of powdered maté. First, that made from the young leaves; samples Nos. 1 and 2 appear to be of this sort. Second, that prepared by the original primitive method of the natives, and which exceeds both of the other kinds in aromatic properties; of this sort Nos. 3, 4, 5, and 6 appear to be samples. Third, that prepared with more care and with the aid of modern furnaces for its torrefaction, and mills for its pulverization; of this sort No. 7 appears to be a sample.

The following experiments were all performed with the utmost care, the method of examination adopted was uniformly applied to all the samples, the air-dried maté was in each case powdered and kept in a well stoppered bottle, to be drawn from as required. The results shown by the first table were obtained by subjecting ten grams of maté to the separate action of each of the different solvents and processes as there shown. The results shown by the second and third tables were obtained by treating ten grams of maté successively with the solvents in the order there given, the difference being that in the second table the maté is last treated with boiling water, and in the third table that solvent is the first to which it is subjected.

* From the *American Journal of Pharmacy*, June 1878. Read at the Pharmaceutical Meeting, April 16, 1878.

TABLE No. I.

10 grams of Maté treated separately with	SAMPLES.						
	No 1.	No 2.	No 3.	No 4.	No 5.	No 6.	No. 7
Boiling Water	3·37	3·65	3·52	3·17	3·09	3·31	3·16
Petroleum Benzin . . .	0·58	0·45	0·41	0·57	0·36	0·45	0·41
Chloroform	0·90	0·75	0·71	0·89	0·51	0·66	0·73
Alcohol, sp. gr. ·822 . .	3·05	3·62	3·83	3·12	3·01	3·24	3·26
Alcohol, sp. gr. ·941 . .	3·49	3·77	3·84	3·23	2·98	3·33	3·36
Tannin	1·55	1·60	1·60	1·60	1·28	1·00	1·30
Caffeina	0·03	0·02	0·06	0·10	0·08	0·16	0·14
Total Ash	0·65	0·58	0·55	0·50	1·09	0·73	0·64
Ash soluble in Water .	0·18	0·15	0·20	0·16	0·12	0·17	0·18
Ash insoluble in Water .	0·47	0·44	0·35	0·34	0·54	0·56	0·47
Ash soluble in HCl . .	0·35	0·40	0·32	0·31	0·53	0·44	0·40
Sand	0·11	0·04	0·03	0·03	0·41	0·12	0·06
Moisture in air-dry Maté	0·75	0·85	0·80	0·75	0·62	0·75	0·71

TABLE II.

10 grams of Maté successively treated with	SAMPLES.						
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
Petroleum Benzin. . .	0·58	0·45	0·41	0·57	0·36	0·45	0·41
Chloroform	0·22	0·24	0·22	0·27	0·21	0·25	0·22
Alcohol, sp. gr. ·822 . .	1·57	2·32	2·49	1·70	1·78	1·90	2·02
Alcohol, sp. gr. ·941 . .	2·12	1·82	1·87	1·84	1·81	1·73	1·68
Boiling Water	0·27	0·24	0·21	0·22	0·20	0·25	0·24
Ash	0·32	0·38	0·29	0·24	0·92	0·40	0·38

TABLE III.

10 grams of Maté successively treated with	SAMPLES.						
	No. 1	No. 2	No 3	No. 4	No. 5	No. 6	No. 7
Boiling Water	3·37	3·65	3·52	3·17	3·09	3·31	3·16
Petroleum Benzin . . .	0·59	0·50	0·53	0·61	0·40	0·43	0·46
Chloroform	0·16	0·17	0·16	0·20	0·15	0·17	0·19
Alcohol, sp. gr. ·822 . .	0·39	0·44	0·52	0·48	0·38	0·31	0·41
Alcohol, sp. gr. ·941 . .	0·19	0·17	0·32	0·18	0·29	0·16	0·21
Ash	0·36	0·36	0·31	0·28	0·92	0·44	0·40

Treatment with Boiling Water, Table No. I.—10 grams of powdered maté were boiled half an hour with 100 c.c. of water, the decoction poured off, and the process repeated four times with the same quantity of water; the decoctions were mixed, filtered, and evaporated on a water-bath to dryness. The extract obtained was of a brown colour in mass, yellow in powder, of slight odour and mild bitter taste. It contained caffeina, tannin, gum, starch, and pectin.

The extract yielded to boiling water by 10 grams of maté after treatment as in Table No. II., was, when powdered, of the colour of unburnt umber, inodorous and tasteless; it consisted principally of starch and pectin.

Treatment with Petroleum Benzin, Table No. I.—10 grams of powdered maté were exhausted by percolation with petroleum benzin, and the benzin allowed to evaporate spontaneously; the result was a thick greenish-black oily extract; the exhausted maté after drying was free of the benzin odour, and retained but little of its own natural odour; the extract after a long time was not entirely free of the odour of the benzin. This extract was found to contain chlorophyll, resin, wax, and fatty matter, and probably a small quantity of volatile oil, though none could be separated; it contained no tannin or caffeina.

After the preparation of a fluid extract of maté by percolation with alcohol, sp. gr. ·941, the residue was dried and 1000 grams of it exhausted by percolation with petroleum benzin; upon spontaneous evaporation of the percolate 43 grams of dark green extract remained; a portion of this having the consistence of castor oil was separated, and a thicker portion, which adhered to the bottom of the dish, was washed with aqua ammoniæ as long as it removed anything, and then washed with dilute hydrochloric acid. There now remained 3·70 grams of a black mass, very adhesive and elastic, and burning with the well-known odour of caoutchouc. This experiment proves that the substances soluble in petroleum benzin are not removed from maté by alcohol of the specific gravity ·941, and a comparison of the figures in the petroleum benzin line in the tables also shows that boiling water fails to remove the same substances.

Treatment with Chloroform, Table No. I.—10 grams of powdered maté were percolated with chloroform until exhausted, and the chloroform evaporated spontaneously; the extract obtained was of a soft waxy consistence, fragrant odour and dark green colour: it contained wax and fatty matter, chlorophyll, resin and caffeina, but no tannin.

The extract obtained by chloroform from 10 grams of maté after treatment as in Table No. II., was pulverulent, of a dark green colour and slight fragrant odour; it contained resin and caffeina, but no tannin.

The extract yielded to chloroform by 10 grams of maté after treatment as in Table No. III., was pulverulent, of a greyish olive colour, and almost odourless; it contained resin and chlorophyll, but no tannin or caffeina.

Treatment with Alcohol, sp. gr. ·822, Table No. I.—10 grams of powdered maté were exhausted by percolation with alcohol, and the alcohol driven off on a water-bath. The extract obtained was of a soft consistence, heavy narcotic odour, and deep green colour; it contained fatty matter, chlorophyll, resin, tannin, and caffeina. A portion of the residue of the maté, after percolation with alcohol, was dried and percolated with petroleum benzin; the percolate was colourless, and upon evaporation no extract whatever was obtained, proving that alcohol of sp.gr. ·822 dissolves all the constituents of maté which are soluble in petroleum benzin. Another portion of the residue from percolation with alcohol was percolated with chloroform; a brownish-green percolate was obtained, which upon evaporation yielded a small quantity of hard, green, wax-like matter, readily fusible, and when burnt giving off the odour of caoutchouc.

The extract yielded to alcohol by 10 grams of maté after treatment with petroleum benzin and chloroform as in Table No. II., was of a soft consistence, greenish-brown colour in mass, and transparent bright yellow colour in thin layers, the odour fragrant and very agreeable, the taste bitter and acrid; it contained resin and tannin, but no caffeina.

The extract obtained by alcohol from 10 grams of maté after treatment with boiling water, petroleum benzin and chloroform, as in Table No. III., was of a dark green, almost black, colour, easily powdered, yielding a pale greyish-green powder, nearly inodorous, and of a slight bitter taste; it contained tannin, but was entirely free from caffeina.

Treatment with Dilute Alcohol, sp. gr. ·941, Table No. I.—10 grams of powdered maté were exhausted by percolation with dilute alcohol and the resulting tincture evaporated to dryness on a water-bath. The extract obtained was of a brown colour, readily powdered, yielding a light yellow powder, of slight odour, and bitter astringent taste; it contained resin, caffeina, and tannin.

The extract yielded to dilute alcohol by 10 grams of maté after treatment as in Table No. II., was of a dark brown colour, readily powdered, yielding a brownish-yellow inodorous powder, of slight bitter, astringent taste; it contained tannin and gum, but no caffeina.

The extract obtained by dilute alcohol from 10 grams of maté, after treatment as in Table No. III., was of a light brown colour in mass, dull yellow when powdered, inodorous and almost tasteless, the presence of tannin shown, but it was entirely free of caffeina and resin.

Tannin.—For the estimation of the tannin the following process was employed (for additional details of similar process, see 'Proceedings of the American Pharmaceutical Association,' 1876, page 513, and *American Journal of Pharmacy*, 1877, page 388). Of each sample of maté, finely powdered, 10 grams were taken and separately treated; first by percolation with petroleum benzin; this removed most of the green colouring matter and none of the tannin, as the percolate upon evaporation and treatment with water failed to give to the proper reagents any indication of the presence of tannic acid. The maté was removed from the percolator, and after drying repacked and treated with alcohol of seventy-five per cent. until the percolate passed free of colour; then the residue was removed to a flask and boiled with several successive portions of alcohol of the same strength, the several tinctures mixed, when cold filtered and the filter washed with alcohol. The alcohol was then driven off on a water-bath, and the solution made up to the previous measure with distilled water, and a slight excess of basic acetate of lead added, which threw down an abundant bright yellow precipitate. This was well washed with distilled water, decomposed by sulphuretted hydrogen, and after heating on a water-bath to remove excess of the sulphuretted hydrogen, the sulphide of lead was removed by filtration and the filter well washed with distilled water. The filtrate was a clear solution of an intense yellow colour, and upon being evaporated on a water-bath to dryness yielded a light-brown amorphous mass, fusible by heat, and which, when powdered, was of a buff colour; its solution strongly reddens litmus paper. The quantity obtained from each sample is shown in Table No. I. It will also be observed that those samples containing the most tannin contained the least caffeina. The following is a description of the behaviour of this peculiar tannic acid with different reagents:—

With ferric salt it gives a bright green at first, turning to brown on standing, and a brown precipitate; with ferrous salts no change at first, becomes green on standing and deposits very dark olive precipitate; with fixed alkalies transparent dark yellow colour unchanged by heat, no precipitate; lime water gives a transparent pure yellow, and on standing a greyish-brown precipitate; aqua ammoniæ gives a transparent intense yellow, almost brown, no precipitate; acetate of copper gives a light green precipitate, not soluble in excess of precipitant; sulphate of copper gives no precipitate in the cold, but when heated a brown precipitate is given; ammonio-sulphate of copper slowly precipitates in the cold, and at once if heated; nitrate of silver is reduced by the aid of heat to the specular form; auric chloride is decomposed in the cold; barium nitrate gives a faint but immediate yellowish-white precipitate; stannous chloride gives a white precipitate; tartrate of antimony and potassium produces no precipitate; sulphate of quinia and sulphate of cinchonia both produce white precipitates; gelatin gives no precipitatate; acetate of lead gives a yellowish-white precipitate; permanganate of potassium in solution is immediately decolorized; molybdate of ammonium produces a brownish-red, which is changed to yellow by oxalic acid; morphia gives a slight precipitate on standing; strychnia gives a white precipitate; aconitia gives no precipitate; veratria with hydrochloric acid gives a white precipitate; salicin and santonin give no precipitate; piperina with hydrochloric acid, colour lightened but no precipitate; sulphuric acid, aided by heat, changes a concentrated solution to a deep red.

Caffeina.—The following process was employed for the determination of the quantity of caffeina: 10 grams of powdered maté and 4 grams calcined magnesia were boiled for half an hour with 500 c.c. distilled water, and filtered while hot, the residue and the filter returned to the flask, 500 c.c. water added, and again boiled for twenty minutes; then filtered and boiling water poured on the filter until the filtrate passed colourless and tasteless. The filtrate was then evaporated at a moderate heat over a naked fire until reduced to 200 c.c., and then 10 grams of powdered glass and 1 gram calcined magnesia were added, and the evaporation continued on a water-bath to dryness. The dry residue was then finely powdered and placed in a small flask with 30 grams chloroform and boiled for a few minutes, and then filtered through a funnel, the neck of which was closed with cotton, and over this was placed a layer of powdered glass. The residue in the flask was treated with fresh portions of chloroform until the caffeina was all dissolved out. The chloroform was then allowed to evaporate spontaneously in a weighed capsule, yielding the caffeina in fine silky form on the bottom and sides of the capsule—perfectly white if the chloroform solution had been allowed to cool before filtration, but if filtered hot the caffeina was very slightly tinted of a greenish colour. The amount of caffeina obtained from each sample will be found in Table No. I.

The Ash.—The determination of the total, the soluble and the insoluble ash was made as follows: 10 grams of maté were burned and the resulting ash weighed, then boiled in a little distilled water, and filtered while hot through a weighed filter, and the filter washed with boiling distilled water. The filtrate, upon evaporation and ignition, gave the weight of the soluble ash, which was verified by drying the filter and its contents, and subtracting the weight of the filter from the total weight. The insoluble ash was then treated with hydrochloric acid, and after washing by decantation, the insoluble portion was dried, ignited, and then weighed, the loss in the weight being taken as the quantity soluble in the acid. The portion insoluble in the hydrochloric acid was principally sand.

Owing to the usual mode of preparing maté, it is rendered certain that the ash is not all from the constituents of the leaves themselves, but partly from earthy matter introduced during the process of preparation.

Pharmaceutical Preparations.—The following preparations of maté are suggested: The simple infusion which is the form in which it is always used in South America; a solid extract prepared with alcohol of sp. gr. ·822, and a fluid extract prepared with alcohol of sp. gr. ·941, in such proportion that when finished its weight will be equal to the weight of maté used in its preparation. A considerable quantity of fluid extract prepared by this formula has been used in debility and in various derangements of the nervous system, generally with satisfactory results.

The reputed therapeutical properties of maté have been fully stated in a number of previously published papers, some attributing the most deleterious effects to its continued use, and others lauding it to the utmost limit of credibility, almost equalling the marvellous statements made of the action of the somewhat similar substance, coca. In regard to maté, however, the writer is fully convinced that it does really possess properties which render it worthy of careful therapeutical investigation.

The thorough desiccation it undergoes in its preparation, and the compact and hermetical character of the packages in which it is contained, tend greatly to the preservation of whatever virtues it may have originally possessed.

SULPHOSALICYLATE OF QUINIA *

Cahours in 1843 recognized the fact that salicylic acid combined with the vapour of sulphuric anhydride. Mendius in 1857 studied this combination, and named it sulphosalicylic acid. Recently Schiff and Remsen have also found that this compound may be prepared by the action of concentrated sulphuric upon salicylic acid. Equivalent quantities of sulphuric acid (98 parts) and of salicylic acid (138 parts) are gently heated together,† producing the new compound in form of a solid deliquescent mass, soluble in water, alcohol, and ether, from which solutions it is deposited on evaporation in long, prismatic needles. Ferric chloride imparts to the solution an intense red-wine colour, differing in this from salicylic acid, which strikes an intense violet.

The best starting point for the preparation of sulphosalicylates of definite composition is the barium salt, which is easily obtained by saturating the hot compound

* From *New Remedies*, April, 1878.

† $C_7H_6O_3 + H_2SO_4 = C_7H_6SO_6 + H_2O$
Salicylic acid + sulphuric acid = sulphosalicylic acid + water

acid with barium carbonate, filtering and—if the salt is desired in a solid condition—cooling or evaporating the solution, when barium sulphosalicylate will crystallize out in hard, shining monoclinic prisms, but little soluble in cold, quite soluble in hot water, and insoluble in alcohol. Its formula is $C_7H_4BaSO_6+3H_2O$; but by varying the temperature, or by concentrating the mother waters left after the first crystallization, two other modifications of barium sulphosalicylate may be obtained, differing in crystalline shape, and probably in water of crystallization.

To prepare sulphosalicylate of quinia, a boiling hot solution of barium sulphosalicylate is exactly decomposed with a boiling solution of neutral quinia sulphate, whereby barium sulphate is precipitated. This is filtered off, and the filtrate (which generally has a roseate tint) cooled, when it becomes covered with a crust of crystals of the new quinia salt. By evaporating the mother waters and cooling, successive crops of crystals may be obtained.

Quinia sulphosalicylate is but little soluble in cold water, although, after having been in contact with it or some time, it dissolves completely. In boiling water it is much more soluble, insoluble in absolute alcohol or ether, but soluble in ordinary alcohol and in chloroform.

INDICATORS IN ALKALIMETRY.*

BY J. T. DUNN, B.SC.

The substance which is almost universally used as an indicator in alkalimetrical and acidimetrical work is litmus. Litmus, however, is by no means free from imperfections, and from time to time different substances have been proposed as substitutes for it. I have thought that a comparison of the principal of these substitutes might not be altogether uninteresting.

The chief requirements in an indicator for alkalimetry are, that the change in colour or other physical character accompanying the passage from the alkaline to the acid condition, or *vice versâ*, shall be easily distinguishable and well marked; that the indications shall be delicate, and shall not be interfered with by boiling, or by the presence of alkaline salts. It would also be desirable if the indicator were unaffected by carbonic acid, and the change could be seen by artificial light.

The indicators which I have examined besides litmus are aurin (rosolic acid, or corallin), phenol-phthalein, fluorescein, cochineal, logwood, hæmatoxylin, alizarin, ferric salicylate, potassic sulphindigotate, and Prussian blue broken up by caustic potash.

This last was suggested at a meeting of this society, some years ago, by Dr. Wright, as a test for free acid, since the brown fluid which is got by suspending a little of the mixture in water turns blue on addition of acid; and it certainly is a very delicate test for acid; but on attempting, at Professor Marreco's suggestion, to use it as an indicator, I found that at each successive alternate drop of acid and alkali the reaction became less and less delicate and sharp. This was found to be due to the presence of sodic sulphate, for when the indicator was heated with a large excess of sodic sulphate in a faintly acid solution the blue colour gradually changed to brownish-black from the precipitation of ferrous and ferric hydrates, and the fluid filtered from these was found to contain sodic ferricyanide. This, of course, totally unfits it for use in alkalimetric work, but the reaction is so curious as to be worth mentioning.

As to the nature of the changes in the various indicators produced by acid and alkali:—Aurin is, in neutral or alkaline solution, a deep red colour, and is changed by acid to a light yellow or nearly colourless fluid. Phenol-phthalein in neutral or acid solution is colourless, and is changed to a deep purple-red on addition of alkali. Fluorescein possesses in alkaline solution a splendid yellow-green fluorescence, which is destroyed by acid. The changes experienced by cochineal and logwood are well known. Hæmatoxylin is almost exactly the same as aurin in its indications, and so also is alizarin. The deep blue ferric salicylate is broken up by alkali, giving a brownish fluid containing suspended ferric oxide; acid, however, does not always restore the blue colour, so I proceeded no further with this one. The last on the list, the sulphindigotate, was also discarded, because the change from blue to green which accompanies the passage from alkaline to acid is by no means so distinct as is desirable.

Next as to the delicacy of the indications. Aurin, hæmatoxylin, logwood, and cochineal are about equally delicate, 200 c.c. of water tinged with each being changed in tint by a single drop of decinormal acid or alkali. Fluorescein and phenol-phthalein are a little less delicate, two drops being required in each case, while alizarin took three drops and litmus required five drops to change it from distinct red to distinct blue.

To test the action of boiling and sulphate of soda on the indications, I dissolved 50 grams of soda ash in a litre of water, took successive portions of 25 c.c., and titrated them with standard acid in the usual way, using the different indicators. Aurin and hæmatoxylin were unaffected, save that the aurin red colour became a little more pink in tint, rendering the change even more conspicuous than in water alone. With phenol-phthalein the final point of the reaction was very difficult to determine, as the pink colour when first produced rapidly fades away, and even when a permanent coloration is reached it is deepened by addition of more alkali, the deepening going on until four or five drops of normal alkali have been added in excess. The changes with fluorescein, cochineal, and alizarin are rendered very much less sharp and distinct, and the logwood assumes a yellowish-brown colour which requires a large amount of acid or alkali to produce any effect on it.

In the case of phenol-phthalein and logwood, to ascertain whether the indistinctness of the reaction was due simply to the presence of sodic sulphate or to the boiling of the solution, portions of the solution of soda ash were taken, an excess of acid added, the liquid boiled to expel CO_2, and allowed to cool; then the indicator was added; and the excess of acid determined by standard caustic soda. In the case of phenol-phthalein, the end of the reaction was just as indeterminate as before, but with logwood it was sharp and distinct, showing that only boiling the solution affects the logwood reaction.

All these indicators are more or less affected by carbonic acid, most of them quite as much so as litmus. Cochineal is perhaps least of all affected, and next to that fluorescein; but both of them are quite sufficiently affected to prevent the use of carbonate instead of caustic alkali in acidimetric work where we wish from any cause to avoid boiling.

On the whole, the only one of these indicators which seems to possess much advantage over litmus is aurin. Hæmatoxylin might be added, but it is no better than aurin, and much more expensive. Aurin is quite as conspicuous in its indications as litmus, or even more so. It is much more delicate; it shares with litmus the disadvantage of being affected by carbonic acid, but it possesses one great advantage over litmus in that it can be worked in gaslight quite as well as in daylight. Litmus, it is well known, can scarcely be used in gaslight, as the change of colour is rendered very indistinct. This can be got over to a certain extent by using sodium light, viewed in which the red litmus looks perfectly colourless and transparent, while the blue appears black and inky looking. But even this is not very sharp, and the trouble of conducting the process in a place where there shall be no other illumination but that of a sodium flame is very great, so that on this account aurin is distinctly preferable to litmus.

A good many preparations of slightly varying composition are sold under the various names of spirit aurin, soluble aurin, corallin, rosalic acid, etc. There is not much difference amongst them, but on the whole I think the "soluble aurin" gives the best indications.

* Paper read before the Newcastle-upon-Tyne Chemical Society.

The Pharmaceutical Journal.

SATURDAY, JUNE 22, 1878.

Communications for the Editorial department of this Journal, books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

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ADVANCE OF THE METRIC SYSTEM.

THE mail has this week brought evidence of decided, if but small, progress made on the other side of the Atlantic by the advocates of the Metric System, in a copy of an order issued under the sanction of the Secretary of the Treasury at Washington, for the adoption by the Medical Officers of the United States' Marine Hospital Service of the Metric System of Weights and Measures for purveying medicines, and for other medical and pharmaceutical purposes. Already, for several years past, the metric system seems to have been partially used in this department, in the purveying of drugs, but in future it is to extend to prescribing and dispensing, the order providing that hereafter "in expressing quantities by weight the terms gramme and centigramme only will be used, and in expressing quantities by measure the term cubic centimetre."

The news will, we believe, be acceptable to a large number of our readers, who would gladly see a little more favour shown to the metric system by the authorities in this country, and the way thus prepared more rapidly for a reform in the present anomalous state of the law, which is held to allow a person to keep the weight and measures current throughout the European continent but not to allow their use for business purposes. It will be interesting, therefore, to watch and learn at some future time, say after twelve months, the amount of obedience that this order obtains from the medical gentleman and pharmacists to whom it is addressed; for it is generally admitted that one great obstacle to the wider acceptation and adoption of the metric system is the reluctance to incur the initiatory trouble involved in the expression of weights and measures in the terms of an unfamiliar system, instead of those of one which, although more complicated, has become familiar by long usage. With every desire to see the object of the order attained, we cannot ignore the fact that public opinion is still far from being ripe for compulsory legislation on the question either in this country or in the States, and it remains to be proved how far the compulsion involved in the expression of the wish of the heads of a department will be successful in overcoming the prejudices, or convictions, which may be held by some of the professional gentlemen under their superintendence.

An appendix issued with the order will, however materially facilitate its working. It contains first a series of simple rules, drawn up by Dr. OSCAR OLDBERG, Chief Clerk and Acting Medical Purveyor of the Marine Hospital Service, for converting apothecaries' weights and measures (official in the United States' Pharmacopœia) into their respective equivalents in metric terms. In these the gramme is for convenience taken to be equivalent to 15 grains, and the cubic centimetre to 15 minims, the fraction, amounting in one case to 2·9 per cent., and in the other to 8·2 per cent., being ignored as unimportant in all ordinary cases. In writing prescriptions, also, it is recommended that the metric quantities obtained by the application of these rules should be expressed in as simple decimal terms as may be practicable without materially changing the dose or the character of the formula.

There are also tables of approximate equivalents of apothecaries' weights and measures in metric terms, running from one sixty-fourth of a grain and one sixty-fourth of a minim to sixteen ounces and sixteen fluid ounces respectively, and a Posological Table in which the doses of all the official medicines are expressed in the terms of both systems.

For transactions on a larger scale, such as preparing requisitions for medical supplies, it is suggested that convenient "round numbers" might be found in 500 grammes (= $17\frac{1}{2}$ oz.) instead of the avoirdupois pound; 30 grammes (or about 20 grains less) instead of one ounce; 500 cubic centimetres (or about 17 fluid ounces) for 16 fluid ounces (the U. S. P. pint); and 30 cubic centimetres for one fluid ounce. The undeniable possibility that, especially during a time of transition, the terms of gramme and grain may be mistaken one for the other through careless writing is acknowledged. It is therefore recommended that in prescribing by gramme the quantity should be indicated by prefixing the common Arabic numeral, and that if abreviated the underscored form Gm. should be used. Thus while ten grains is written "gr. x.," using the Roman numerals, ten grammes would be represented by "10 Gm." When it is desired to use the word centigramme it is recommended to write it in full, but it is obvious that the more simple way would be to represent 10 centigrammes by "0·10 gramme."

ALLEGED DANGER OF CARBOLIC ACID DRESSINGS.

IN the last report of the Berlin University Surgical Clinique there is an account of a child three years old, which died from an acute carbolism after the application of carbolic "antiseptic" dressings consequent upon an osteotomy on the leg. The use of carbolic acid dressings, however, has now been altogether discontinued with children at the Berlin Surgical Clinique.

At the late meeting also of the German Surgeons Congress in Berlin Dr. KUESTER delivered an address on the toxic effects of carbolic acid dressings, in which he stated that within the last three years he had seen five cases of such poisoning, four of them terminating fatally. He expressed his belief that, from the uncertainty of the symptoms shown in such cases, many might have been mistaken as cases of collapse or shock. From experiments made on dogs he found that 0·076 per cent. of the body weight constituted a lethal dose of carbolic acid. But small animals and persons in weak health or faint from loss of blood were liable to be affected by smaller doses. Dr. Kuester found the antidote of Sonnenburg, sulphate of soda, to be of value only in lighter cases, and such as were of a less acute character. In Germany where the antiseptic method of Professor Lister has been followed much more extensively than in England, especially in the London Hospitals, the Germans themselves say that it is the lower sanitary standard of their hospitals which compels them to cling to it and seek a compensation in it for other drawbacks. A sort of reaction against the use of carbolic acid seems to be imminent, like that which has set in against excessive use of chloroform in the London hospitals. Professor Koenig, of Goettingen who advocated at the same meeting permanent irrigation in all cases of an already established sepsis of wounds, recommends exclusively a solution of salicylic instead of carbolic acid.

ANTISEPTIC SOLUTION OF BENZOIC ACID.

A handy preparation for dressing and disinfecting wounds, suggested by the experiments of Professor Salkowski, of Berlin, on the strongly antiseptic properties of benzoic acid, has been found very valuable and pleasant for its deodorizing effects in practice on shipboard by Dr. Senftleben. It is a solution of half an ounce of pure acidum benzoicum e resina in ten ounces of rectified spirit. This preparation may be used like the alcohol phéniqué of the French, but it is of far more agreeable smell and taste. It may be mixed with water for making lotions, gargles, mixtures, and will probably be found very effectual in naval and military practice. It may also become an article of the toilet, for like salicylic acid benzoic acid is innocuous, but its antiseptic action is by some considered to be stronger, and it volatilizes practically almost as readily as carbolic acid, but with a very different odour.

MEDICINE CHESTS OF AMERICAN SHIPS.

The United States enjoy the advantage of having a medical superintendent or "supervising surgeon-general" of the mercantile marine hospital service, who is an officer immediately subordinate to the minister, the Secretary of the Treasury at Washington. In his last yearly report for 1875, this active and zealous officer says, "The medicine chests used by vessels contain many medicines which are obsolete, such medicines having been susperseded in the healing art by others of more definite applicability; and in cases where more modern remedies have been introduced into medicine chests, they are for the most part of no use, or harmful in inexperienced hands, for the reason that the printed directions furnished to vessels have not been revised, and are consequently below the present standard of medical knowledge." Without going further into the matter of ships' medicine chests, or criticizing the "scale" for them prescribed by the British Board of Trade we may venture to point out the absence of some of the more modern available preparations, as salicylic acid, magnesia citrate, etc., which might be entrusted to the judgment of captains for administration at least as well as bichloride of mercury, calomel, or antimonium tartaratum.

THE MEDICAL ACTS AMENDMENT BILLS.

The second reading of the Government Medical Acts Amendment Bill in the House of Commons is fixed for Monday next, to which date the second reading of the other Bills on the same subject has been deferred. It is understood that all four of them will then be referred together to a Select Committee.

THE ANTAGONISM OF DIGITALIS AND ACONITE

In the *British Medical Journal* Dr. Milner Fothergill's report upon the antagonism of digitalis and aconite has been concluded, the following results being arrived at :—Digitaline and aconitine simultaneously administered exhibit no antidotal power, but if the digitaline be administered for five to nine hours before the aconitine, a distinct protection is afforded; if given at less than five hours beforehand, digitaline only intensifies the poisonous action of aconitine. Other conclusions arrived at are that atropine in four grain doses administered up to sixteen minutes after a poisonous dose of aconitine effectually antagonizes the action of the latter, but that small doses of aconitine do not appear to exercise any influence over poisonous doses of atropine. A recent instance of poisoning near Kidderminster, in which a man died from the effects of drinking a liniment composed of linimentum aconiti and linimentum belladonnæ, fully endorses these experiments. Atropine does not, however, exercise any antagonistic influence over poisonous doses of chloral.

The report upon the physiological action of the chinoline and pyridine series of compounds contains some very interesting conclusions, so far as the experiments have gone, but since some of them are merely tentative and may require to be modified on further investigation, it will be best not to allude to them at present. It is satisfactory to find, however, that the tendency of the present day is to apply scientific investigation to medicine, and no longer to rely solely upon empirical treatment. The number of substances whose medical properties are being examined is increasing year by year, although the experiments are often conducted at considerable risk to the investigators; thus last year the properties of casca bark, and more recently those of the Jamaica nightshade (*Urechites suberecta*) and duboisia have been experimented upon, all of them being extremely active poisons.

Provincial Transactions.

CHEMISTS AND DRUGGISTS' TRADE ASSOCIATION OF GREAT BRITAIN.

A meeting of the Law Committee of this Association was held at the office, 23, Burlington Chambers, New Street, Birmingham, on June 14, 1878, at 1 p.m.: Mr. S. U. Jones, President, in the chair.

After the Medical Act, 1858, Amendment Bill and the Medical Act, 1858, Amendment, No. 2, Bill had been carefully considered, it was moved by Mr. Holdsworth, seconded by Mr. Southall, and unanimously resolved:—"That the President be requested to address a communication to his Grace the Duke of Richmond and Gordon requesting him to receive a deputation from the Chemists and Druggists' Trade Association of Great Britain, with a view to submit to his Grace's consideration some alterations in the Medical Act, 1858, Amendment Bill as amended in committee on re-commitment."

It was also moved by Mr. Jervis, seconded by Mr. Holdsworth, and unanimously resolved:—"That the President, together with Messrs. Greenish and Hampson, and the Solicitor of the Association, be appointed to wait on his Grace the Duke of Richmond and Gordon, and on the member of the House of Commons who has charge of the Medical Act, 1858, Amendment Bill, and failing a satisfactory answer from them, the members of the deputation be empowered to take such steps as they deem advisable."

Communications were read from several members asking for legal advice in various matters, and the Secretary was instructed to forward the information requested.

LEICESTER CHEMISTS' ASSOCIATION.

At a meeting of the chemists of the town of Leicester, held at the rooms, 4, Halford Street, on Thursday, June 13, 1878, Mr. Henry Cooper, Ph.C., in the chair:—

It was proposed by Mr. Berridge, seconded by Mr. E. H. Butler, and carried:—That this meeting fully approves of the resolution of the Council of the Pharmaceutical Society passed as its meeting on June 5, 'To appeal against the decision of the Judge of the Bloomsbury County Court in the case of the Society *v.* The London and Provincial Supply Association,' and trusts that no effort will be spared to bring the appeal to a successful issue."

Proposed by Mr. E. H. Butler, seconded by Mr. Thirlby, and carried:—"That this meeting desires to support the Executive Committee of the Trade Defence Association in their endeavour to obtain, in the Duke of Richmond's Medical Acts Amendment Bill, the repeal of clause 20 of the Apothecaries Act."

Proposed by Mr. W. B. Clark, seconded by Mr. Hodgson, and carried:—"That this meeting approves of the action of the Trade Association in defending the interests of chemists in prescribing, and will support the Defence Fund."

A vote of thanks to the chairman, and his reply thereto, concluded the meeting.

PHARMACEUTICAL SOCIETY OF VICTORIA.

The twenty-first annual meeting of the Pharmaceutical Society of Victoria was held on Wednesday, March 13, in the hall of the Royal Society. Mr. William Johnson, the president of the Society, occupied the chair. In his opening address the chairman alluded to the efforts made by the council of the society to pass a Pharmacy Bill through the Legislature, and the anticipation that it would have to be brought forward as a private bill had made them very careful of the society's funds. Having in view the examinations required by the present Act, the council had some thought of establishing a pharmacy school, but the number of members was at present too few to render it practicable. They had then endeavoured to come to an understanding with the University, and had been met in a very fair spirit.

The honorary secretary read the annual report, which congratulated the society on its continued progress. During the past year the Society had lost its President, Mr. W. F. D'Arcy Irvine, and Mr. C. A. Atkin having declined the post, Mr. W. Johnson was unanimously elected president. The library had been enriched by the addition of many new and valuable works on materia medica, chemistry, and pharmacy. Since the last annual meeting 40 new members had been elected. The balance-sheet showed that the receipts amounted to £181 3*s.*, and there was the sum of £379 19*s.* 2*d.* in the bank to the credit of the society.

On the motion of Mr. Holdsworth the report and balance-sheet were adopted.

Mr. Brind suggested that the council of the Society should devise some means whereby the law relating to the sale of poisons should be carried into effect.

Mr. Bosisto brought up the report of the sub-committee appointed to consider the subject of a school of pharmacy, which showed the expenses attendant on such a school would be much greater than was anticipated, and that the number of apprentices was not sufficient to warrant the expenditure. It was understood that the University contemplated making arrangements for instruction in pharmacy, in connection with the medical school. The sub-committee recommended that a deputation should wait upon the vice-chancellor and Professor Halford with the view of obtaining a conference between the council of the society and the University. The report was adopted unanimously.

On the motion of Mr. Best it was resolved that in future the legal age of 21 years adopted by the Pharmacy Bill, as required for full membership, be adopted by the Pharmaceutical Society, in lieu of 25 years as heretofore.

Messrs. Blackett, Baker, Rocke, and Fullwood were elected members of council. Messrs. Kingsland and Rawle were re-elected as auditors.

Proceedings of Scientific Societies.

ROYAL INSTITUTION OF GREAT BRITAIN.

The Deterioration of Oil Paintings.*

BY R. LIEBREICH, M.D., M.R.C.S., M.R.I.

Oil paintings are subject to various kinds of changes, which may be considered as diseases, requiring different treatment according to their different nature. A science needs to be formed, a pathology and therapeutics of oil paintings. The pathology would have to describe and explain those diseases and their progress, and to develop the methods by which a correct diagnosis could be arrived at in each individual case. The therapeutics would teach the remedies which might be applied either to cure or to alleviate the disease, or at least to stop its progress. A hygiene would follow, which would have to teach how to avoid pernicious influences, and which, besides, while giving precepts for the technical process of painting, would have to forestall those constitutional diseases which, even in cases where no noxious influences can be traced, are the causes of decay, after a comparatively short period of existence. As medical science is above all things based on anatomy and physiology, so the exact knowledge of the structure of a picture would have to be acquired previously to any study of its disease. Unfortunately, direct investigation alone can procure no such exact knowledge; on the contrary, we are obliged to

* Lecture delivered at the Royal Institution of Great Britain, Friday, March 1, 1878.

enter upon a minute historical investigation of the material as well as of the technical methods adopted by artists of different schools and different periods.

The excellent works of Cennino Cennini, Mérimée, Sir Charles Eastlake, Mrs. Merrifield, and others, have already furnished most valuable material; but still the field for investigation remains unlimited; for, in order to enable us to secure the conservation of each valuable painting, we ought to know exactly how it was made. The artists of the present time would spare infinite trouble to the investigators of future times if, along with their works, they would leave the account of their practice in the case of each picture. A treatment without exact knowledge of the normal condition, as well as of the nature of the disease, is, as we shall see, as dangerous for the picture as it would be in the case of living beings.

Professional restorers of pictures admit this danger in a general way; each of them, however, is convinced that he himself, by his personal knowlege, skill, and care knows how to avoid it. The public pays too little attention to the subject, and therefore it occurred to me that it might be useful to give a short account of what we know about this question, of the changes to which oil paintings are exposed, as well as of the means either to avoid or to cure them.

We have to consider, first, the material on which the artist has painted, that is, as far as oil painting is concerned, principally wood and canvas.

Secondly, the priming, that is, the substance with which the surface was prepared in order to be made fit for painting.

Thirdly, the painting itself, that is, the pigments and vehicles used for it, and the liquids that were added during the painting, the mediums, meguilp, siccative, varnish, essential oils, etc.

Fourthly, the coat or coats of varnish spread over the picture.

The wood on which a picture has been painted may either warp, or get chinks in it, or become worm-eaten, or even altogether rotten. Against warping, the remedy usually applied is moisture. If the panel is very thick it is first made somewhat thinner; then the back is moistened and the picture is left to lie on its back for twelve to twenty-four hours, after which time it will be found to have bent straight. Of course this must not be continued longer than necessary, otherwise the convex surface, instead of becoming plane, would become concave. When straight, the picture is kept so by beads which have to be adapted in a particular way, a certain degree of shifting being allowed for the expansion and contraction of the wood.

Cracks in the wood are drawn together by inserting pieces of wood of a special shape.

Sublimate solutions are employed to destroy worms.

Trifling losses of substance are replaced by cement. Small portions of rotten wood, not extending too near the painting, are cut out and replaced by wedge-shaped pieces. If, however, the greater part, or the whole substance of the panel, is rotten, the picture must be separated from it and transferred to new wood, or rather to canvas.

This was first tried by Hacquin in Paris, and was performed successfully upon many pictures, and, among others, upon one of Raphael's Madonnas, in the Gallery du Louvre, and upon Sebastian del Piombo's "Resurrection of Lazarus," now in the National Gallery. The process no longer appears so very marvellous; it is generally executed in the following way:—

First of all the surface of the picture is pasted over with gauze and paper; after that the wood is made straight by moistening, or, if necessary, by making incisions with the saw, into which cuneiform pieces of wood are driven. By means of a tenon-saw the panel is to be sawn into little squares, which must be removed by a chisel, and in this way the thickness of the wood is reduced to half an inch; it is then planed until it becomes no thicker than paper, and the rest is removed by means of a knife and with the fingers. The painting being thus severed from its basis, it can be fixed on canvas, if the priming is sufficiently preserved. In the opposite case, a mixture made of chalk and glue, or something of the kind, must be put on first, and very evenly smoothed after being dry. This done, the new canvas has to be fixed upon it by means of a mixture of glue, varnish, and turpentine, and the substance of the picture pressed tightly and evenly against it by means of warm irons.

In order to avoid deterioration, the most minute precepts have been given for preparing the panel. It has to be taken from the best oak, or nut-trees, or cedars. The wood is to be cut into boards during winter-time, and kept till autumn before being dried; it can then be prepared only in the following spring, etc. It would certainly be preferable to give up wood panels altogether for large pictures, and only to think of means to make the canvas stronger. For small pictures, panels offer certain advantages, and can be more easily preserved from decay.

In the canvas we meet with the results of injuries or spontaneous decay. A rent may be mended by rags of linen stuck at the back of the picture. Even a hole may be filled up by pieces taken from other decayed paintings. If the picture is considerably damaged, it will be best to line it. But if the whole canvas is rotten and tattered, it will be preferable to sacrifice it by pulling off the threads one by one, after having secured the painting itself by pasting paper on the front of it. This done, the painting is transferred to another canvas in the same way as those removed from wood.

There are different modes of priming, which may be brought under two principal heads: the distemper and the oil priming.

1. The canvas is distempered by a mixture of chalk or plaster and paste, or glue, which may be laid on raw, unbleached canvas, or this latter may be beforehand prepared with glue or paste. Several coats of this mixture must be put on in succession, one being perfectly dry before the next can be applied. Many of the older oil paintings are painted on such ground. It has the advantage of being quicker prepared, of absorbing the excess of oil, of permitting the colour to enter into the priming, and to dry quicker, and, moreover, of containing a white absolutely innocuous to the other colours.

The inconveniences, on the other hand, are: that it more easily breaks, and under the influence of humidity separates from the canvas.

2. The oil priming consists of several coats of oil colours. As each of these must be perfectly dry before the next is laid on, and as, moreover, time must be given to the whole to dry completely before painting upon, in order to avoid the sinking in of the colours, the whole preparation is much slower than the distemper. Nevertheless it is now generally adopted.

Rey, in France, has pointed out a process which is a compromise between the two methods; he begins by distempering, and after several coats of distemper, having dried one after the other, he puts a coat of oil which, as it were, changes the distempered ground into an oil-colour ground.

With oil priming it is of importance that the principal colour be white-lead, to which are added comparatively small quantities of yellow, black, or other colours. For a whole century a school, that of Bologna, predominated in Italy, which abandoned this principle. During the second half of the 17th and the first half of the 18th century, most of the Italian masters of other schools followed its example. Probably for the purpose of obtaining more easily the desired effect of the chiaroscuro they painted on a brownish-red priming, which consisted of bolus mixed with umber. Not one of those pictures has kept its original colouring. Not only has the priming caused all the dark parts to grow much darker, but it has destroyed, or nearly so, all the glazing, so that only those colours can be recognized which either contain white, or are glazed on white. I can show you numerous instances of this, for, on account of the extreme fertility of this school, there is little difficulty in procuring pictures of masters of that time or of their pupils.

Wood priming does not require the same elasticity as that of the canvas, which ought to be capable of being rolled. Therefore the priming of the wood shows less variations. It is generally composed of chalk or plaster, tempered with starch, paste, size, or glue, and more or less thickly laid on. In some pictures of different centuries we find, either between the wood and the priming, or between the priming and the painting, canvas, and exceptionally even paper.

The diseases of the priming are not of a very complicated nature. They manifest themselves principally in three different ways: 1, by cracks in the priming itself; 2, by the severance of the priming from the painting; 3, by the severance of the priming from the wood or the canvas. The third disease is by far the most frequent, especially among pictures on canvas distempered with paste. If small pieces only are scaling off or blistering, they are fixed again to the ground by letting a solution of size pass between the detached part and the canvas, and pressing both gently together. If the deterioration extends over a considerable surface, the picture has to be lined. While this is being done, and while the gluing substance penetrates into the picture, the detached parts are pressed on again with slightly heated irons. If the whole priming threatens to come off, it will be better to take the picture entirely from the panel or canvas, and to transfer it to a new canvas.

I shall show you examples illustrating the before mentioned points, and among them two pictures; one in oil, taken off from canvas, the other in tempera, taken off from wood. Both of them, strange to say, have escaped destruction without having been transferred to a new canvas, and without being covered with paper, as is usually done, before taking them off. They show you the painting by itself from both sides. I have, of course, used every precaution in bringing them safely over from Florence, where I happened to discover them carefully stowed away among heaps of old pictures.

We come now to the most important part of the picture, the painting itself. We meet very often with the idea that the old masters had been in possession of colours, that is pigments, the knowledge of which has been lost, and that this accounts principally for the difference between the oil painting of the 15th and 16th centuries, on the one hand, and that of the 18th and 19th on the other. But this is a great mistake. We know perfectly well the pigments used by the old masters; we possess the same, and a considerable number of new ones, good as well as bad, in addition. In using the expression of good and bad, I am principally thinking of their durability. From this point of view the pigments can be placed under three headings:—

1. Those that are durable in themselves, and also agree well with the other pigments with which they have to be mixed.

2. Such as when sufficiently isolated remain unaltered; but when in contact with certain other pigments change colour, or alter the others, or produce a reciprocal modification.

3. Those which are so little durable that, even when isolated from other pigments, the mere contact of the vehicle, the air, or the light, makes them in time fade, darken, or disappear altogether.

The old masters used, without reserve, only those belonging to the first of these three categories. For those belonging to the second they imposed on themselves certain limits and precautions. Those belonging to the third they did not use at all.

That some of the modern masters have not followed these principles, is not owing to a lost secret, but to the fact that they disregarded those well-known principles, and even consciously acted against them. In Sir Joshua Reynolds's diary, for instance, we read that in order to produce certain tints of flest, he mixed orpiment, carmine-lake, and blue-black together. Now, orpiment is one of the colours of the second category, carmine-lake one of the third. That is to say: orpiment, as long as it remains isolated, keeps its brilliant yellow or reddish-orange colour; but when mixed with white-lead it decomposes, because it consists of sulphur and arsenic, and it, moreover, blackens the white-lead, because the sulphur combines with it. Carmine-lake, even if left isolated, does not stand as an oil colour, and therefore has been superseded by madder-lake.

Unfortunately some of the most brilliant colours are perishable to such a degree that they ought never to be used; yet, it seems to me, that just in one branch of art in which of late remarkable progress has been made, I mean landscape painting, the artists, in order to obtain certain effects of colour not easily to be realized, do not always resist the temptation to make use of a number of pigments the non-durability of which is proved beyond doubt. However that may be, I think it pretty certain that the pigments in themselves play only a subordinate part in the deterioration of oil paintings, and that the principal part belongs to the vehicle with which the colours are ground, and to the liquids which are added during the painting. I hope, therefore, you will excuse my making some elementary explanations about these liquids.

(To be continued.)

Parliamentary and Law Proceedings.

Poisoning by Strychnia.

An inquest was held on May 29, at West Barkwith, before Dr. Mitchinson, coroner, on the body of Charles Pacey, aged two years. On the previous Monday, the child drank from a medicine bottle on the table, which the mother believed to contain a solution of quinine. This had been given to her some time previously by the clergyman's wife (Mrs. Thompson), when she was suffering from debility. The child became ill and died. Dr. Harrison, who was called in, took possession of the bottle from which the child was supposed to have taken the poison, and telegraphed to the London chemists (Messrs. Keene and Ashwell of New Bond Street) who had prepared the medicine for Mrs. Thompson. In reply, they informed him that it was a solution of strychnine which had been furnished to a lady six or seven years ago. The jury returned a verdict that the child died from the effects of strichnine poisoning taken accidentally, and that no blame was to be attributed to the mother; but at the same time they wished to express their strong dissatisfaction that the chemists should have sent out so strong a poison without putting a poison-label upon the bottle. Mrs. Thompson was under the impression that it was simply a solution of quinine.

The *British Medical Journal* commenting on this case says:—"Several persons appear here to be in fault. The practice of handing about medicine from one person to another, without any adequate knowledge of the contents of the solution or its suitability for the individual, is in itself reprehensible. On the other hand, it is wrong to dispense such a medicine as that described in the present case without a very strong indication of its poisonous character; and, in our opinion, not only should the word "poison" always be very clearly inscribed, but such solutions should only be dispensed in coloured fluted bottles."

Poisoning by Colocynth.

On Thursday, June 13, W. Buckle, Esq., deputy coroner, opened an inquest, at Peterborough, on the body of a young woman named Mary Ann Everitt, aged 22 who died suddenly on the previous day, after having taken a quantity of colocynth.

Evidence having been given as to the deceased taking the drug, a boy named Smith, seven years of age, not sworn, said: Mary Ann Everitt sent me to a chemist's, next to the Cathedral Yard. I brought some scent back, and gave it to her. She sent me for some scent first, and then wrote a letter. I went to a place against Nichols' first, but they said they could not let a little boy have it, and she must come for it herself. I then went somewhere else. No one else was present when I gave it to her.

Henry Noble, assistant to Mr. Pearson, chemist, Market Place, said: The little boy came to the shop yesterday for threepennyworth of bitter apple. I gave it to him, as it is generally used for putting in furs to keep the moths away. (Mr. Pearson here explained that it was not in the schedule of poisons that was printed and posted up in the shop to guide the apprentices.) The written ord·r was put in, and Sarah Jane Everitt recognized it as her sister's writing. The order was: "Will you oblige me by sending me 3*d*. of bitter apple."

Dr. Thomson said: When called in I found Mary Ann Everitt on a sofa upstairs, apparently suffering from a powerful dose of some irritant poison. She had violent spasms of the stomach, abdominal muscles, and heart. I at once said she had taken poison. Her sister said, "Yes, she has taken something." The deceased called to me: "Oh, do give me something, do hold me, I shall die." I asked her to tell me what she had taken or she would die. She said she must not. I asked her to tell me who had given it to her, but she said she could not tell me who told her to take it. I ordered applications and drove off for the stomach pump and other antidotes. When I returned I saw it would be fruitless and she died about two minutes after I got back. Her sister gave me a powder, which I believe to be the powder of colocynth, a drastic purgative commonly called bitter apple, ignorantly resorted to for producing criminal abortion. If the stomach was empty the powder would act very quickly and very violently. From what I have seen and heard I believe powdered colocynth to be the cause of death, but to speak with certainty a *post mortem* examination would be necessary, when it would probably be shown the cause for taking the drug. She looked like a woman in perfect health, robust and strong. A neighbour named Bellamy, who was present at the time, told me that she had reason to believe that the deceased might be pregnant. My opinion, from the symptoms, is that death was caused by colocynth, but to speak positively either to that or pregnancy, a *post mortem* examination would be necessary.

At an adjourned inquest, Dr. T. J. Walker said that with Dr. Thomson he had made a *post mortem* examination of the body of deceased, and confirmed the suspicion of pregnancy. Having heard Dr. Thomson's evidence and a description of the symptoms during life, and having examined the body, he thought the deceased died from a narcotico-irritant poison. A less quantity than 2 drs. of colocynth has caused death. Very few medical men have experience of death from poisoning by colocynth. He was not aware that colocynth is ever used as a means of producing criminal abortion.

The jury returned a verdict of "Accidental death," the deceased having died from taking an overdose of narcotico-irritant poison.—*Peterborough Advertiser*.

Another Violet Powder Case.

On Thursday, the 13th inst., Mr. Humphreys held an inquiry at the Marquis of Lansdowne Tavern, High Street, Kingsland, as to the death of a child, aged ten days, the daughter of a costermonger, living at 6, Wellington Street.

Elizabeth Branch, 18, Brown Place, Shacklewell, deposed that she nursed the mother of the deceased, who was too ill to come out. Shortly after the birth of the child she used some violet powder upon it which she was told to use by the mother. The following day she noticed a redness all over the child's body, and on the third day sores. She then thought of the violet powder poisoning case that she had read in the papers, and at once discontinued it, using powdered starch. She asked Dr. Brown to look at the child, and he said she had done quite right in not using the violet powder, and took a packet away with him.

The mother of the child said she bought the powder of Mr. Read, chemist, at the corner of the street.

Dr. Henry Brown stated that the deceased when born was a very fine healthy child. On the third day he found her covered with sores all over the body, and on the previous Friday the child died. He had since made a *post-mortem* examination, and found all the organs healthy. Death was due to inflammation of the stomach and body caused by the use of the violet powder.

The coroner said the case was one of extreme importance, especially to the people who sold the powder. He would send the powder to Dr. Tidy for analysis; and in the meantime the inquest would stand adjourned.—*Times*.

Poisoning by Carbolic Acid.

An inquest was held by Mr. Coroner Harrison, at Belgrave, near Leicester, on Saturday last, on the body of an elderly man, named Thomas Warner. He was in the employment of Mr. Frederick Hawkes, living in the Loughborough Road, Belgrave, and on Friday was ordered to clean out the wine cellar at his master's house. While in the cellar he found a bottle, which he fancied contained brandy. He drank some of it hastily, and had swallowed a considerable quantity before he discovered that it was carbolic acid and not brandy. He was found in great pain, and notwithstanding that medical aid was at once called in he died shortly afterwards in the Leicester Infirmary, where he had been removed. The jury returned a verdict of "Death from misadventure."

Indictment of a Chemical Manufacturer for Nuisance.

In the Queen's Bench Division of the High Court of Justice on Wednesday, before the Lord Chief Justice and Justices Mellor and Lush, the case of the Queen *v.* Wallis and another was heard. This was an indictment for a nuisance. The defendants were chemical manufacturers in the Wandsworth Road, and in consequence of the nuisance to the neghbourhood arising from the manufacture they were indicted. When the case came on first for trial the jury were unable to agree to a verdict, and they were discharged. On the second trial the defendants pleaded guilty, relying, when they came up for judgment, on their having abated the nuisance.

Mr. M. Howard, Q.C., with whom was Mr. Smith, now prayed judgment on the affidavits that had been filed for the prosecution.

Mr. Grantham, Q.C., appeared for the defendants.

The plaintiffs (the Local Board of Works) had filed upwards of eighty affidavits to show that the nuisance had not been abated, but continued up to within the last few weeks. The nature of that nuisance was to be inferred from the fact that 250,000 gallons of gas liquor were brought upon the premises weekly to be used in the manufacture, and that the works were going on continuously, Sundays included. The gases evolved in the manufacture were stated by numerous medical men practising in the neighbourhood to be of the most poisonous character, and that they were continually being called in to treat persons suffering from their effect.

Mr. Grantham, Q.C., for the defendants, said he had filed eighty-two affidavits (some of them by the plaintiff's witnesses) showing that the nuisance had been abated. The defendants had expended over £6000 within the last twelve months to effect that object.

The Lord Chief Justice, in giving judgment, said the Court were not satisfied one way or the other whether this nuisance, which undoubtedly was of a serious character, was at that moment abated. The defendants must pay the costs up to the present time immediately, and then the Court, not being thoroughly satisfied as to the fact that the nuisance had been abated, were disposed to give some further time to the defendants to prevent its continuance. The matter would therefore stand over until the fifth day of next November sittings.

Dispensing Memoranda.

[107]. Hoffman's Anodyne.—The following extract from 'First Lines of the Theory and Practice of Philosophical Chemistry,' by John Berkenhont, M.D. (London, 1788), may be of interest to your readers :—

"*Liquor (Mineral-Anodyne) of Hoffman.*—This German physician not having left behind him his receipt for making this famous anodyne liquor, which is not in the smallest degree anodyne, we know nothing certain either of the ingredients or their proportion. Some writers tell us it was made by distilling nitrous acid with spirit of wine, and adding to the liquor thus obtained a small portion of oil of cloves. If this be true, it was a kind of nitrous ether, or rather sweet spirit of nitre; but in the 'Chemical Dictionary,'* we are told that it is made by mixing an ounce of the spirit which rises first in the distillation of vitriolic ether, with the same quantity of the ether which follows, and twelve drops of the oil which rises after the ether has passed. If this be the proper receipt this anodyne liquor is no more than the spiritus vitrioli dulcis of the shops."

Kingston-on-Thames. Edward Whaley.

[115]. Raisins, B.P.—The sultanas are generally used, as they are free from seeds. Raisins are ordered in B.P., "to be freed from seeds," the reason of which is that the seeds contain an acid (? astringent) principle.

"Tenens."

[117]. Tinct. Cardamomi.—In answer to J. W. Barnes, I should certainly use tr. card. simp. when tinct. cardam. is prescribed if I did not know the prescriber to mean tr. card. co. I should say that the party that used tr. card. co. could not understand much about dispensing.

G. T. Stephens,

[117]. Tinct. Cardamomi.—If J. W. Barnes had Tinct. Cardomomi ordered in a prescription he would be justified in using the official preparation. Generally when the prescriber means the non-official preparation he writes Tinct. Cardam. *Simp.*

"Tenens."

[118]. Pulv. Scammony.—When pulv. scammony is ordered, what should be dispensed—pulv. radicis scammon. or pulv. gum. scammon?

Borgue.

[119]. In the B.P., under Acid. Sulph. Aromat., Acetum Scillæ, and Infusum Cinchonæ, after macerating or infusing for a certain time, the directions are, filter or strain, but it does not say anything about making up to any particular quantity, like it does the tincture. I want to know whether they should be made up or not. I have asked several in the trade; some say they should and others say not, therefore I shall feel extremely obliged if some one will give me a positive answer.

T. J. Rayson.

* He does not state whose dictionary he quotes.

[120]. Will any reader say if the following prescription should be clear when sent out, and how should it be prepared?—

℞ Ferri Citrat. . . . . ℈ij.
Tr. Nucis Vom. . . . . ʒss.
Tr. Quinæ . . . . ad ℥ii.

W. F. C.

Highgate, N.

[121]. Tinct. Eucalyptus Globulus.—What is the best formula for tincture of *Eucalyptus globulus*? Some tinctures that I have had mix perfectly clear with water and others again form quite opaque solutions, owing, I suppose, to difference in the strength of the spirit used.

E. Coates.

Obituary.

Notice has been received of the death of the following:—

On the 5th of February, 1878, Mr. Henry John Lutwyche, Chemist and Druggist, Cardiff. Aged 35 years.

On the 13th of February, 1878, Mr. Thomas Siddall, Chemist and Druggist, Easingwold, Yorks. Aged 59 years.

On the 10th of March, 1878, Mr. Thomas Kirby, Chemist and Druggist, Liverpool. Aged 47 years.

On the 19th of March, 1878, Mr. Matthew Redhead, jun., Chemist and Druggist, George Street, Liverpool. Aged 33 years.

On the 4th of April, 1878, Mr. Charles Isaac Farmer, Chemist and Druggist, Ashford, Kent. Aged 49 years.

On the 25th of April, 1878, Mr. Evan Jones, Chemist and Druggist, Bangor. Aged 58 years.

On the 30th of April, 1878, Mr. Edward Rainey Pharmaceutical Chemist, Spilsby. Aged 46 years. Mr. Rainey had been a Member of the Pharmaceutical Society since 1854.

On the 5th of May, 1878, Mr. William Iverach, Pharmaceutical Chemist, Kirkwall, Orkney. Aged 67 years. Mr. Iverach had been a Member of the Pharmaceutical Society since 1852.

On the 6th of May, 1878, Mr. Alfred John Orme, Chemist and Druggist, Birmingham. Aged 30 years. Mr. Orme had been an Associate of the Pharmaceutical Society since 1870.

On the 7th of May, 1878, Mr. Charles Wicker, Chemist and Druggist, Frimley, Surrey. Aged 69 years.

On the 11th of May, 1878, Mr. Edwin Paul Evans, Pharmaceutical Chemist, Cleobury Mortimer. Aged 66 years. Mr. Evans had been a Member of the Pharmaceutical Society since 1842.

On the 13th of May, 1878, Mr. George Jolly, Chemist and Druggist, Poulton-le-Fylde, Lancs. Aged 41 years.

On the 16th of May, 1878, Mr. George Cowl, Chemist and Druggist, Blackpool. Aged 49 years.

On the 19th of May, 1878, Mr. Conrad William Wright, Chemist and Druggist, Bristol. Aged 24 years. Mr. Wright had been an Associate of the Society since 1874.

On the 23rd of May, 1878, Mr. Thomas Wells, Chemist and Druggist, Pimlico. Aged 41 years. Mr. Wells had been a Member of the Pharmaceutical Society since 1871.

On the 16th of June, 1878, Mr. Daniel Gillett, Chemist and Druggist, Seacombe. Aged 33 years.

On the 13th of June, Mr. Edmund Roberts, Chemist and Druggist, Newnham. Aged 27 years.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Proposed Admission of Women to the Society.

Sir,—In your editorial columns to-day you propose the acceptance of Mr. Vizer's idea of an informal poll of the members on the question of admitting women to the membership of the Pharmaceutical Society. I hope if this course is carried out that some pains will be taken to put the true issue before the members, as nine out of ten of the writers argue as if the question was whether women ought to be admitted to practise pharmacy as assistants, or on their own account. The pleasant little skit in your correspondence columns bears only on the same point, as "Annie, M.P.S.," need not be a member to do all she speaks of doing. The question of the right of women to pass the examinations and open shops is not in our hands to decide. The Legislature has decided that for us, and the question is simply: Certain ladies have passed and are registered as pharmaceutical chemists: is it right, just, or expedient that they be admitted as members of the Society? Whether they be admitted or not will not influence their position in any way; nor, I believe, will it influence in the least degree the small number who are likely to present themselves.

The question is: Is their demand just, and if so, is it expedient to refuse it? My only desire in writing is to get the true issue put plainly before the members. As many members do not know the address either of Mr. Wade or Mr. Vizer, they should be published with the question to be answered.*

JOHN S. LINFORD

Sir,—Will you permit a non-pharmaceutical reader to enter an indignant protest against the letter in your last number headed "The Adventures of a Lady Pharmacist"? The honourable and hard-working women who are endeavouring to earn a livelihood as pharmacists might surely have been spared the insults scarcely veiled beneath the sarcasm of the writer who, whatever he is, is certainly no gentleman. Surely he cannot have been silly enough to imagine that his letter would be taken by your readers as a serious production. The opponents of the admission of women must resort to better arguments than the covert sneers of this letter, which, I doubt not, would be disowned by all the best on their own side. The impression produced on one who contemplates the affray from without is simply that such unfair weapons would not be taken from the armoury unless it were found that the legitimate ones had lost their power, and that those who use them know that they are fighting a losing battle.

AN OUTSIDER.

Counter Prescribing.

Sir,—As there is a great deal of discussion at the present time regarding the right a chemist has of prescribing, I should like to say a few words regarding the difficulties which beset chemists trying to do without it.

I opened a business in a populous neighbourhood some four years ago, and one day had a prescription brought to me to dispense written by an M.R.C.S., L.S.A., M.B., containing an ingredient I had never heard of, so I accordingly wrote to the medical man asking him in what book or pharmacopœia I should find it. He kindly replied, and sent me the formula, being a private one, and told me that the mistake had been the person had gone to the wrong shop.

Shortly afterwards another of my customers called in and informed me that he should have all he wanted from me, except physic, which his doctor, an M.D., M.R.C.S., L.M., L.S.A., had particularly requested him to go to a chemist about half a mile off for.

I also lost the dispensing for several other customers by another practitioner, an M.D., making up his own own medicine at a private surgery. Now I think if chemists are deprived of prescribing altogether that there will only be two things open to them, viz., to leave the business or with very great inconvenience to themselves begin their studies afresh and go in for the examinations of apothecaries, which with many, especially the older members of the trade, would be very hard.

H. H.

* Mr. J. Wade, 174, Warwick Street, Pimlico, S.W., and Mr. E. B. Vizer, Church Road, Cliftonville, Brighton.

The Victoria Pharmacy Act.

Sir,—In the January number of your valuable journal you devoted an article to our Pharmacy and Poison Acts. Your summary is remarkably good and gives a very clear outline of these enactments, but there are one or two points which it would seem are a little misunderstood. As one of those who had a principal part in elaborating the regulations for the examinations, etc., I would ask to be allowed to make a few observations. With respect to the preliminary examination, I wished to adopt that of the Pharmaceutical Society of Great Britain in its entirety, but was overruled; indeed I strenously urged that apprentices should pass the matriculation examinations of our University before being indentured and I still think that course would have been better than the one decided upon. However, I do not think that in practice we shall find the omission to which you draw attention productive of much harm, as the schools of the colony are so excellent that youths who have been sufficiently educated in the subjects included in a liberal education would not be likely to be ignorant of "simple and compound proportion."

The Board of Pharmacy will, until some school of pharmacy is established similar to and emulating that at Bloomsbury Square, demand that candidates attend lectures and pass the examinations at the University, which are very stringent and well-conducted; we considered that these examinations and the subsequent examination before the Board would make our examination equivalent to your "Major." You mention, as if with emphasis, that it is especially mentioned that "the candidate must be able to spread plaster with neatness and dexterity," that part of the regulations was copied from those of the Pharmaceutical Society of Great Britain as given in the Calendar for 1877, which I have not at hand. You express your regret that the title of Pharmaceutical Chemist has been "again appropriated for use by persons passing an examination which will be a test of the lowest measure of qualification considered consistent with the public safety." I think you underestimate the value of our examinations. However, the reason why we did not adopt two grades was because we considered, after much discussion, that the title chemist and druggist was vague, not sufficiently defining what was meant by a chemist as distinguished from an analytical or pure chemist, but we certainly intended that our curriculum, which can be improved and extended without the necessity for fresh legislation, should be such that the title of pharmaceutical chemist would be obtained only by those who are worthy of it. In the early days of the Pharmaceutical Society of Great Britain, the Major examination was very different from what it is now, and we do not doubt but that, as experience is gained, we shall remedy any shortcomings and, if need be, make our examinations more severe, certainly not forgetting the "Major" as a model, which it will behove us to keep before us, if we find that ours falls short of that standard. I may mention that the Council of our admirable University intend to establish a chair of Pharmacy. When all arrangements are settled I shall have much pleasure in forwarding you full particulars.

C. R. BLACKETT,
President of the Pharmaceutical Society, Victoria, and Member of the Board of Pharmacy, etc.

Melbourne, April 15, 1878.

The Sale of Patent Medicines.

Sir,—I think the practical suggestion offered by "W. T. R." "that the trade demand of the makers of patents that they should not supply their preparations to any of those people who notoriously undersell us" is hardly practicable, owing to the following considerations. The makers of the numerous proprietary articles are not all chemists, hence they have not all an interest in the trade. It is of very little moment to the proprietors who retails their medicines, whether he be a chemist, bookseller, or tea dealer, so long as they get the same price wholesale from each.

Would not the concession, if made, be prejudicial to their own interests, as their preparations would be less within the reach of the public than at present, which with a return to the original and proper retail prices might retard in some measure the sale?

A. J. S.

Future of the Stamped Nostrum Trade.

Sir,—Your correspondent, "Northumbria," announces his intention to appoint a grocer or stationer as his agent in all cases where chemists refuse to sell his preparations.

All very well; indeed I should not be surprised were he to utilize the peregrinations of old Middensquint, ragman and bone merchant.

To this course there is, so far as I know, but one objection, and that is his look out.

Grocers, stationers, hawkers, and ragmen in their anxiety to give nothing for something, may on their own account start as proprietors, and then we shall have back door visitors offering new remedies for old clothes.

Just think of it: Middensquint's balsam for a threadbare coat; box of headache pills for a bulged hat; "pick-me-up" for a petticoat; court plaster for a gent's trousers; strapping ditto for a boy's; fly-papers for stays; and a brace of amadou corn discs for a pair of well worn boots!

Ictus Equi.

York, June 18, 1878.

The State of the Drug Trade.

Sir,—Like every well wisher of our business, I have perused with great interest and pleasure the letter in last week's Journal from the pen of Mr. J. Wade: and its influence has been the more refreshing from its having appeared at a most critical time, just when we are experiencing the greatest depression in trade.

In January last I addressed some words to you on the subject of "low prices." A few letters have since that time appeared in the Journal, and several private communications have reached me in reference to it. Some of those were accompanied by price lists, to show me how cruelly were my correspondents suffering from the circulation of these degrading periodicals.

It was hoped that at the annual meeting something practical would have been done; that some promise would have proceeded from the Council, to the effect that the business should not be allowed to go to ruin, whilst there was such mental power and such ample pecuniary means to prevent it. But we were doomed to disappointment: no promise of help came. In London, as in many parts of the country, there are a few—alas how few!—of us maintaining the original and proper prices of the patent medicines and other articles: but at a severe strain and loss, we are clinging to the wreck, hoping ere it is to late, aid will surely come.

I think with Mr. Wade, that if the Council would but give its time and attention for the next twelve months to the welfare of our business—leaving education—we should not have at the next May meeting the general and piteous cry, "What has the Society done for us?"

A plan has been proposed, which if taken up earnestly would be very serviceable. It is simply for the Council to issue price lists, suited to various localities, so that if a chemist having agreed to conform to certain prices was known to undersell, on his failing to give a satisfactory explanation thereof, he would be known as one who had broken faith with his neighbours.

Of course it is well understood, we have in our ranks those whose tendency has been, and is likely to be, devoid of that principle which actuates the man "who loves his neighbour as himself." It will be hard to deal with these persons: nothing can at present be done with them but to leave them to their own unhappy unsatisfying reflections.

In conclusion, let me remind those on whom rests the responsibility of having well nigh ruined our business, that they cannot console themselves with the feeling that what they have done has been called for by the public. My own experience has taught me, that all our customers require of us is, not to be supplied with medicines and other articles at reduced prices, but fair and honorable dealing.

J. R. Summers.

86, *Curtain Road, London, E.C., May* 28, 1878.

Production of the Poison Register.

Sir,—I trust every chemist will keep his poison register to himself, answering only such necessary preliminary inquiries as a coroner's officer or any authorized official may make for the purpose of elucidating any mysterious death by poison, and giving full information only after receiving a summons from a coroner or magistrate.

While upon the poison subject, I wish to say that I regret very much to see from time to time reports of cases of deaths from poisons sold by registered chemists without a proper register of the sales. I think it is especially incumbent upon all chemists to observe rigidly the regulations of the Poisons Act, that being as far as I know the only Act of Parliament that acknowledges the legal existence of chemists.

It is very much the habit of many of our trade to say of this Act, "Thank you for nothing," but I have no sympathy with this feeling.

If we are at any future time to ask for further legislation acknowledging our status as pharmacists, questions will very naturally be asked as to how we carried out this our only Act, and if chemists are negligent in this matter how can they be trusted with higher and greater privileges?

I find no difficulty in getting compliance with the regulations; I explain the penalty of non-registration, and positively decline to sell except the regulations are observed. With a fresh customer it takes two minutes, with an old one not half a minute to register a sale, and as my entries average from 600 to 800 per annum I think I know something about the trouble of the matter.

James Slipper.

London, June 19, 1878.

Dispensing Charges.

Sir,—Whilst deploring the sale of patent medicines, proprietary articles, and "Easton's Syrup" by drapers, which last act is certainly amenable to the law, I cannot help thinking more has to be laid to the charge of our own brethren than even these. The following case will, I think bear out what I say.

A prescription was brought to me last Wednesday night, of which the following is a correct copy:—

℞	Ferri et Quin. Cit.	℥j
	Tr. Nucis Vom.	℥ij
	Sp. Chlorof.	℥iij
	Aq.	ad ℥viij

Whilst preparing it, the gentleman remarked that he usually got it nearer the Marble Arch, and paid "one shilling," as he said, not expecting for a moment I should do it at the price. Some of your readers will say he perverted the truth to a considerable extent to save a few pence. Such was not the case however. I know it as a fact that that is the usual price for an 8oz. mixture, no matter how taken, and not by an outsider, but judging from the medals with which the prescription wrappers are studded, one who has earned high distinction at the hands of the Pharmaceutical Society. Now at that rate, I think the profit is about proportionate to selling a patent at $10\frac{1}{2}d.$,—treating the labour as one of love, and not charging for it.

A Kilburn Chemist.

Arsenical Fly-Papers.

Sir,—Some little time ago, a boy, eight years of age, was admitted into St. Thomas's Hospital with marked symptoms of belladonna poisoning. On being questioned he stated that he had swallowed the liquid in which an ordinary fly paper had been steeped. As, however, he had been forbidden under severe penalties to touch a lotion which was in the house at the time, and as it was extremely unlikely that any preparation of belladonna existed in the fly paper, it was considered that he had swallowed a portion of the lotion, and endeavoured to conceal his disobedience by stating that he had drunk the fly paper liquid. Extract of physostigma was administered to the boy, who finally recovered.

The lotion and the paper were placed in my hands for analysis. I succeeded in detecting atropine in the lotion, which was apparently the green extract of belladonna rubbed down with water, and to my surprise found a considerable quantity of arsenic in the fly paper.

My particular object in writing this letter is to call attention to the fact that fly papers commonly contain arsenic. This may be well known to the majority of your readers, but it was certainly unknown to myself and to several to whom I have spoken on the subject. In fact, one stated that he had last week informed a lady customer that fly papers were only fatal to insect life. In order to ascertain whether fly papers generally contain arsenic, and if so to what extent, I procured six samples, bearing the name of six different makers. In five of the six I found arsenic, and on estimating the amount obtained the following results, being in each case the mean of two experiments:—

No.	Amount of Arsenic As_2O_3 in each Paper.
1	1·92 grains.
2	2· ,,
3	2·95 ,,
4	6·25 ,,
5	5·36 ,,

The sixth kind examined was Papier Moure. This contained no arsenicum in any form whatever, although it is stated in Beasley's 'Druggist's Receipt Book' and in Cooley's 'Encyclopædia' to be largely impregnated with arsenic. It was very bitter to the taste and as it contained no strychnia I inferred that it contained some preparation of quassia. I endeavoured to isolate quassiin from a number of the papers, but towards the end of process lost the whole and I have not had time to repeat the operation.

In all the arsenical fly papers the arsenic existed chiefly as free arsenic As_2O_3, for the aqueous solutions were faintly but distinctly acid, and though nitrate of silver gave reactions for arsenites, ammonio-nitrate of silver gave very much more decided reactions.

Now according to the strict letter of the law, it is unlawful for any but registered chemists and druggists or pharmaceutical chemists to sell this preparation of arsenic, and even the registered chemist is acting illegally who sells an arsenical fly paper without labelling it poison, placing his own name and address upon it, registering the sale, taking care that the purchaser is known to him, and if not, insisting that he (the purchaser) be introduced by some one known to both.

I have no wish to cause additional restrictions to be imposed on the chemist in the carrying on of his business, but supposing that a chemist sold some of No. 4 paper without registering the sale, etc., and further, supposing that a child swallowed the liquid with fatal results, and that an inquest was held, there is much probability that the coroner would severely censure the seller, although he (the seller) might be perfectly ignorant of the poisonous nature of the fly-paper. Independently of this consideration I think that there are few men who would wittingly take the responsibility of selling a number of sheets, some of them containing over six grains of arsenic, to be moistened with water and distributed in open plates and dishes throughout dwelling houses.

I consider, therefore, that it behoves all chemists in business to ascertain the nature of the fly-papers which they sell, and to cease retailing those which may be found on examination to contain a poison which might be fatal to human life.

SYDNEY PLOWMAN.

St. Thomas's Hospital, June 19, 1878.

THE NEW PRONUNCIATION OF LATIN.

Sir,—De Quincey, in one of those amusing essays of his, in which wisdom and high philosophy are so admirably combined with humour, describes in serio-comic style the indignation he felt when, as he passed along country roads, he was assailed by the barking of the miscellaneous curs that issued from the various farms. He, a man who knew Latin well, and could write it purely, to be insulted by mongrel brutes, whose reputed acquaintance with the Latin tongue had become a current phrase! Sundry authors, more straightforward than complimentary, have asserted that the Latin that chiefly flourishes amongst chemists is of the dog Latin sort, and possibly the chemist might point to the medical man, and say, "Arcades ambo," for the percentage of medical men who could frame a good Latin sentence, or even write out in full the terminations of words in ordinary prescriptions is not considerable. Latin, however, is not everything, though it has been lauded as the language of "humanity," yet I would fain see a wider appreciation of the merits of this noble language among pharmaceutists; it might be a relief from the toils of the counter to turn the pages of Virgil, Horace or Ovid. But in saying this I am not professing admiration of those purists (or quibblers shall we say?) who object to hear abbreviations of familiar Latin words, and would wish their students to ask in full for Unguentum Antimonii Potassio-Tartratis, instead of shortening this to Ung. Antim. Pot. Tart., and so on. But it affords matter for some speculation what attitude the chemists who are to form the next generation will assume with regard to the new Latin pronunciation which is vexing the souls of professors, as well as pupils in schools and colleges. Apprentices are entering our businesses who have been initiated in the new method, and I can fancy that in some instances they must feel a little awkward, seeing that the estimable principal of the establishment pronounces Latin as he was taught to do in his boyhood, that is to say, almost exactly as English is pronounced in England. The advocates of the old mode can certainly plead that long usage sanctions their way, but on the other hand it must be granted that the Continental mode, which is supported by the best authorities (for even abroad opinions differ), is likely to be the nearest to the utterance of the ancient Romans. Ultimately, as I presume, whether few or many Latin words are uttered behind our counters, they will be pronounced in the way that is presumed to be correct. The characteristics of this new style make it seem strange to English ears. "C" is generally as "k," and "g" is hard as in "get"; "j" or "i" (where that vowel has the power of a consonant) as "y" in "yard," and "v" like "w," though this is debateable. "A" has mostly the broad sound of "a" in "father." We ought all at least to understand what this new pronunciation is, even if we decline to follow it.

J. R. S. CLIFFORD.

THE EFFECT OF CHLORAL HYDRATE ON A HEN.

Sir,—The following facts may amuse if not interest your readers. A carrier taking some syrup of chloral to a customer, broke the bottle, the contents falling on some bread. On arriving at home he thoughtlessly threw the bread to a fowl (a laying hen), shortly afterwards he found it asleep, or, as he thought dead, he however took it into his house and placed it near the fire where it remained perfectly still, to all appearances dead, for rather over forty-eight hours, during which time it layed two ordinary eggs, one each day and appeared not to have suffered at all from its long sleep beyond a slight awkwardness in the movement of its legs for about fifteen minutes. I cannot say the quantity of chloral taken, the syrup contained a dram of chloral to each fluid ounce, the quantity of bread consumed by the fowl was about three ounces, which was completely saturated with the chloral. I can vouch for the truthfulness of these statements.

J. L.

May 31, 1878.

TO THE BENEVOLENT.

Sir,—Kindly allow me to acknowledge in your columns, that in addition to subscriptions amounting to £37 12*s.* 6*d.* already acknowledged in the Journal, I have received on behalf of Mrs. Dixon the following:—Brother, Berwick-on-Tweed, 2*s.* 6*d.*; R. G. Parnell, £1 1*s.*

Southampton. ROBERT CHIPPERFIELD.

"*Druggist.*"—Section 16 of the Act provides that the provisions respecting examination shall not extend to or interfere with the business of wholesale dealers in supplying poisons in the ordinary course of wholesale dealing.

"*Inquirer.*"—Consult the Calendar of the London University.

E. H. Orange.—Dr. Dymock's paper on Chaulmogra Oil appeared in the *Pharmaceutical Journal* for March 25, 1876, p. 761.

G. W. J.—No licence is required for the sale of quinine wine if made according to the B.P., and not sold as a proprietary or patent medicine. Otherwise a licence is necessary corresponding with the conditions under which the wine is sold.

J. G.—(1) Strictly speaking the preparation is subject to the regulations. (2) Lockyer's 'Science Primer of Astronomy,' 1*s.*, published by Macmillan.

"*Devonia.*"—*Lathyrus Nissolia.*

Associate, G. F.—(1) See *Pharm. Journ.* [3], vol. v., p. 401. (2) You will find recipes in Cooley's or Beasley's 'Receipt Books.' (3) The fact should be communicated to the Secretary.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. Jolly, Crook, Fisher, Romans, Whaley, Ferguson, Jackson, Atkinson, Baiss Bros., Perry, Griffith, Leigh, Young's Paraffin Company, Aggrieved A.P.S., W.P.

"THE MONTH."

Of all the months in the year June and July are most prolific in medicinal plants, and the pharmacist's botanical harvest may then be said to commence. Belladonna, dulcamara, digitalis, red poppy, valerian, aconite, hemlock, white horehound, and elder are all in blossom and ready to be gathered. Biennial henbane, too, is now in excellent condition, judging from a magnificent specimen recently forwarded to the museum of the Society by Mr. Chapman, of Ipswich. This specimen is no less than four and a half feet high, about three feet in diameter, and branched all round the stem. "It grew about fifty yards from the sea, among thistles and sea poppies, in a mixture of sand and shingle and without any tree or other shelter."

Matricaria chamomilla, *Linum catharticum*, *L. usitatissimum*, horseradish, fool's parsley, masterwort, lovage, angelica, alkanet, *Acorus calamus*, *Ptelea trifoliata*, and *Pyrethrum roseum* are all now to be seen in blossom. An account of most of these was given last year.

At Kew, in addition to these, the indigo plant (*Indigofera tinctoria*), *Capsicum annuum*, *Theobroma Cacao*, the niger seed plant (*Guizotia oleifera*). *Dorstenia Contrayerva*, *Ricinus communis*, and *Coriandrum sativum* are also in blossom. At Regent's Park the coca plant and *Asclepias curassavica* are still in flower. In this garden, as also at Edinburgh, the *Rheum officinale* has been flowering freely, its pale gracefully drooping spikes of flowers contrasting well with the red ones of *Rheum Emodi*. Close by, *Veratrum viride* is also now to be seen in blossom; its green flowers appear at first sight to have no pistil, but upon opening the group of stamens three minute carpels, almost distinct from each other, may be found hidden beneath them.

In the country there may now be found in blossom two or three singular plants, belonging to the umbelliferæ, which are worthy of examination.

One of these, the wood sanicle, is a sad puzzle to young botanists. Growing in damp shady woods, and with a habit something like that of the wood anemone, but with more rigid glossy almost evergreen palmate leaves, and with small heads of flowers arranged in an irregular scanty umbel, the relationship of the plant is by no means obvious at first sight. The small umbels look like capitula, but on closer examination it will be found that a few of the outer flowers in each head are shortly stalked and contain only stamens, while the inner flowers are quite sessile and have both stamens and pistils. The fruit when cut across is seen to be a cremocarp, which at once points out to what family the plant belongs. The cremocarp is covered with small hooked bristles, which are curved inwards. This plant was formerly in high repute as a vulnerary. In fact its properties passed into a proverb in France:—"He who keeps sanicle has no business with a doctor." Nevertheless, according to Dr. Prior, the name is not derived from the Latin for health, but is a corruption of the German for Saint Nicholas, a saint who, according to the legend, obtained by his prayers the restoration to life of two children who had been murdered and pickled in a pork tub by an innkeeper. The plant is still used by herbalists, particularly of the American school, as an outward application to wounds and ulcers, and is also taken internally, together with decoction of comfrey root, for healing internal ulcers or stopping hæmorrhage.

Another curious little plant, the marsh pennywort (*Hydrocotyle vulgaris*), has leaves bearing considerable resemblance in shape and size to those of the navel wort (*Cotyledon umbilicus*). It grows on wet boggy pasture land and creeps along the ground. It is one of the few British plants which have peltate leaves; the margin of these is doubly crenate. The umbels are hidden among the leaves and consist of from 2—5 flowers, which are sessile, or on a short peduncle, and were it not for the fruit being a cremocarp there would be but little to indicate that the plant bears any relation to the umbelliferæ. The limb of the calyx is not developed, and the petals are ovate and entire and valvate in æstivation, on which account the late Dr. Seemann placed the plant in araliaceæ; and the fruit has no vittæ. The plant derives its name of "sheep-rot" from the supposition that it causes the rot in sheep, a fact which has been denied. That it is poisonous to sheep is, however, not improbable. Not long since specimens of this plant and of *Ranunculus flammula* were received from a farmer in the provinces, who alleged that whenever sheep were turned into the field where the specimens grew, they ate these plants and were sure to die.

Gerarde too says there "is a kind of navel-wort that groweth in watery places which is called the husbandman's sheeps-bane, because it killeth sheep that do eat thereof," and adds "that the plant is of a hot and ulcerating quality like to the crowfeet (buttercups), whereof it is a kind." Whether the plant be really poisonous, or whether the sheep die of disease engendered by the boggy soil in which it grows, is open to experiment. It would be interesting to ascertain if a sheep kept in a dry place and fed on the fresh plant would be affected by it. Possibly only some of the sheep will eat it, for Dr. Bancroft speaks of a plant in Australia of which when a sheep has once tasted it, it separates itself from the flock and will eat nothing else, remaining for some days in a kind of intoxication until it dies.

A nearly allied species, *Hydrocotyle asiatica*, L., which may be seen in the Botanical Gardens at Regent's Park, is official in the Indian Pharmacopœia in the form of powder as a stimulant application to ulcers. The properties of our native species seem therefore to demand investigation.

Another interesting plant is the sea holly, *Eryngium maritimum*, which at first sight might easily be taken for a composite plant, the flowers being sessile and forming a kind of capitulum, while its prickly appearance by no means tempts close examination. The plant is easily recognized by its pale bluish glaucous leaves and prickly habit and may be found on almost any sandy place near the seashore. The stamens being incurved and the petals shorter than the spiny calyx teeth, it requires some little trouble to make out the structure of the flower. When examined carefully the separate anthers and fruit (evidently a cremocarp) point out that the plant belongs to the umbelliferæ. The roots were recommended by Dioscorides for flatulence and are still considered to be restorative by the Arabs. The "kissing comfits," spoken of by Falstaff, were supposed to be made of the roots of this plant. According to Culpepper sea holly possesses powerful aphrodisaic properties, and wonderful healing and alterative powers. The other British species of this genus, *Eryngium campestre*, is very rare and local in this country, and has leaves much resembling those of a thistle.

The collection of the roots of the sea holly must have been a somewhat tedious affair, for Culpepper remarks "The root groweth wonderful long, even to eight or ten feet in length." Candied eringo root even now is not altogether an obsolete article.

At the Regent's Park Botanical Gardens a curious variety of the plantain, *Plantago lanceolata*, may now be seen, in which the bracts are developed in the form of a rosette of leaves at the top of the flower stalk, the flowers themselves not being produced. A somewhat similar monstrosity of the *Plantago coronopus* was lately found by Mr. W. W. Reeves in Sussex, and is figured in the *Gardeners' Chronicle* of June 1, page 699, and figures of others similar in character may be found in Gerarde's 'Herbal,' p. 420.

By far the prettiest British species of this family is the *Plantago media*, which although not generally abundant is very common on chalky or calcareous soils. The leaves are smaller than those of the *Plantago major*, and are pressed close to the ground, destroying the grass underneath them, so that in lawns, etc., where it occurs in any quantity it becomes a nuisance. The pretty appearance of the spikes when in full flower is owing to the contrast between the white anthers and the very long lilac-coloured extended filaments. The plantains, more especially the larger species (*Plantago major*), had once a high repute for healing wounds, sores, and swellings, etc.; hence Romeo, speaking of a broken shin, is made to say:—

"Your plantain leaf is excellent for that."

It is very curious how properties of plants become lost sight of, and are brought to light again after many years. The *Medical Press and Circular* quotes the statement of an American homœopathic practitioner to the effect that the common plantain (*Plantago major*) is a sure remedy for toothache. When the plant is in flower, the leaves are gathered, chopped finely, and packed closely in a bottle, and covered with alcohol for a week, a piece of cotton wool is saturated with the tincture, and inserted in the cavity, and four drops of the tincture are put in half a glass of water, of which a teaspoonful is taken. It is also used to alleviate pain in the process of teething, for which purpose it is rubbed on the gums. When inserted in the ear it is said to be equally effectual in earache. This reads almost like an extract from Culpepper, who says: "The roots of plantain and pellitory of Spain, beaten into powder, and put into the hollow teeth, taketh away the pains of them. The clarified juice or distilled water, dropped into the eyes, cooleth the inflammation in them, and taketh away the pin and web, and dropped into the ears, easeth the pains in them, and helpeth and removeth the heat." The small seeds of an allied species, *Plantago Psyllium*, formerly known as flea seed, from its form and colour, are highly mucilaginous, and when swallowed whole form a valuable demulcent, in consequence of the mucilage being gradually liberated. Spogel seeds, from *Plantago Isphagula*, possess similar properties, and are still official in the Indian Pharmacopœia in catarrhal and renal affections, as well as in diarrhœa and dysentery.

The lemon-scented verbena (*Aloysia citriodora*) is well known in this country as a fragrant garden favourite, but few perhaps know to what practical use it can be turned. In a recent work entitled 'Among the Spanish People' it is described as being systematically collected in Spain, where it is considered to be a fine stomachic and cordial. It is used either in the form of cold decoction, sweetened, or five or six leaves are put into a teacup, and hot tea poured upon it. To quote the words of the author, "the flavour is simply delicious, no one who has drunk his pekoe with it will ever again drink it without a sprig of lemon verbena." But not only so, those who use it are promised, "You will never suffer from flatulence, never be made nervous and old maidish, never have cholera, diarrhœa, or loss of appetite."

The flower show at the Botanical Gardens at Regent's Park on the 12th of June, was very rich in orchids, such a grand bank of plants not having been seen for a long time. The pelargoniums also formed a very effective group. Fine foliaged plants, new plants and varieties, a fine series of annuals in pots, heaths, and especially the rhododendrons, were the chief groups in the display. Only fine weather was wanting to make the day a great success.

'Medicinal Plants' for June contains figures of the following plants, *Gossypium barbadense*, *Citrus vulgaris*, *Citrus medica*, *Prunus serotina*, *Citrullus Colocynthis*, *Dorema ammoniacum*, and *Statice Caroliniana*. Of these *Prunus serotina* is perhaps better known under its commercial name of *Prunus Virginiana*, and *Statice Caroliniana* under the name of *Marsh Rosemary*, although the latter is almost unknown in this country. In New England it is considered to be a valuable astringent. The plates are good, with the exception of *Citrus vulgaris*, in which beauty is certainly sacrificed to "perspective." The matter is up to the most recent date. Those who study materia medica will find in this work many remarks worthy of perusal, not to be found in the most recent works on that subject.

In the drug market a few unusual articles have been offered for sale. Among these are the bark of *Pterocarpus flavus*, the roots of *Coptis Teeta*, *Pæonia Moutan* and Indian Jalap; the leaves of *Caroba* and *Cnicus benedictus*. The bark of *Pterocarpus flavus* occurs in long thin flat pieces, minutely striated externally and smooth on the inner surface, with a light yellow, flaky fracture and a bitter taste. In China it is used, according to Porter Smith, as a tonic, diuretic and antirheumatic. It is also used to dye silk of a yellow colour. The root bark of the Moutan peony occurs in reddish-brown or blackish quilled pieces two or three inches long, with small scattered warts, rough scars here and there, and a radiated, starchy, pinkish, short fracture. It has a powerful odour, resembling that of *Hemidesmus Indicus*. The taste is astringent and slightly pungent. In China it is largely prescribed in congestions, menstrual disorders, hæmorrhages, and for worms. *Coptis Teeta* is official as a tonic in the Pharmacopœia of India, and is remarkable for the quantity of berberine (8½ p. c.) which it contains.

In the *British Medical Journal*, Dr. J. A. Francis, of Southsea, points out that the proper spelling of the plant already mentioned in this and other journals under the name of Roromiko, is Koroniko. He fully endorses all that was stated about it in the *Evening Standard* of May 10, and states that the drug is more certain in its effect than the ordinary astringent mixture. It is used in the form of a strong infusion of the leaves. The plant has some resemblance to the common broom.

In the *Philadelphia Medical Times*, Dr. Keen recommends a new form of lint known as paper lint. It is prepared by Messrs. Wyeth and Co., of Philadelphia, in sheets eighteen inches long by twelve inches wide, which are as thick as patent lint, and consist of pure paper felt. It has, however, the disadvantages of being easily torn and not fitting very closely to very uneven surfaces. These defects Dr. Keen thinks can be remedied by adding a number of cotton threads to it in the manufacture, and coating the outer surface of the lint with India-rubber. At present when saturated with solution of carbolic or salicylic acids, waxed paper is used to cover it. Its absorbent power is stated to be greater than ordinary lint, while it costs only one quarter the sum. As a cheap substitute for lint, this new article seems worthy of the attention of institutions where cost of material has to be taken into account.

Some valuable remarks by Dr. Buch, concerning the injurious effect of salicylic acid upon the teeth, have appeared in the *St. Petersburg Medicinische Wochenschrift*. He states that having been in the habit of brushing his teeth with a solution of 1 part of the acid in 1000 parts of water, he found that in a few weeks his teeth felt softer than usual and seemed as if there were grit or sand between them. On examination he discovered that the surface of the teeth was rendered soft and granular by the action of the acid. He therefore strongly cautions the public against the use of salicylic acid as a wash for the mouth and teeth.

After these results it becomes almost necessary to inquire whether salicylate of sodium possesses the same property, so that those who have to take either the acid or its salts may be cautioned to rinse the mouth after taking each dose.

A fresh application of salicylic acid has been made known by Dr. Fergus of Marlborough College. He finds it very useful as a topical application in diphtheria and gives in the *Lancet* the following formula for its use:—Salicylic acid, 50 grains, rub it with six grains of glycerine, and two drachms of a concentrated solution of acetate of liquor (*sic*) ammoniæ. The liquid is perfectly clear and the application causes neither pain nor irritation.

Dr. R. H. Goolden, writing to the same journal, calls attention to the valuable cholagogue properties of the sulphate of manganese, and points out that although its properties were described some years ago in Dr. Pereira's work on materia medica, the remedy is by no means so well known as it deserves.

In the Lombardy *Medical Gazette* an account is given of a case in which hydrophobia was cured by two Russian doctors by the use of oxygen gas. After the patient had consumed three cubic feet of gas the spasms were subdued, and although they returned the next day a second administration for the space of forty-five minutes caused the symptoms to disappear altogether.

The recent researches of Bert show that oxygen under a pressure of five or six atmospheres becomes diffused through the tissues and the organic oxidations are diminished, leading to an immediate reduction of the temperature of the body. Thus it becomes evident that the therapeutical properties of oxygen under varying conditions are by no means fully known. Had Jules Verne been aware of the facts now related his fertile fancy might perhaps have made still more amusing the delightful story of 'Dr. Ox's Experiment.'

In this age of discovery we need perhaps to be reminded that there is nothing new under the sun. According to the *Medical Examiner*, Dr. Huillet, late of Pondicherry, after perusing some Hindoo manuscripts preserved in that city, has come to the conclusion that a certain Dahwantori, who flourished several thousand (!) years before Hippocrates, was well acquainted with vaccination. In the manuscripts alluded to the effects produced by inoculation with the matter taken from a man or a cow are described, and the secondary disease so produced is stated to be identical, except in being harmless.

Dr. Sherwell, of Brooklyn, finds linseed taken internally a useful remedy in various affections of the skin, as *Pemphigus foliaceus*, *Pityriasis rubra*, *Lichen planus*, and *Lichen ruber*. He directs his patients to carry some in their pockets, and from time to time to take a little in the mouth, and chew it thoroughly before swallowing. He states that the general condition of the patient improves almost as much as if cod liver oil had been taken, and that the state of the skin becomes ameliorated.

Coloured photographs are no longer a dream but an actual fact. M. J. Albert, photographer to the Court at Vienna, has invented a method of photographing in natural colours. The process depends upon analysing white light with the three primary colours, yellow, blue, and red, and in the recovery of the colours ready for the press. A plate is chemically prepared so as to receive only the yellow light and the tones of the colours of the object to be reflected, and the first photograph is taken on this and a negative of that plate is put under the press, the cylinder of which is covered with yellow paint, so that none but the tones of the yellow colours are seen in the impression. After that the object is photographed on a plate made to reflect only the blue tints. This plate is treated in the same way as the first, except that the cylinder is covered with blue paint. In the same manner the tones of the red colours are received on a third plate. By printing the individual colours of yellow, blue, and red over each other a picture is produced true to nature, the colours affording the natural tints by being printed over each other. Already this new discovery has been proposed to be turned to account in works on surgery for photographing skin diseases.

A new application of the telephone has been suggested by Sir Henry Thomson. It is well known that in operation for stone it is very necessary not to leave even a small piece of it in the bladder. It is proposed to use the microphone to ascertain the presence of fragments in the bladder. There are, however, difficulties in the way of its application at present, which possibly a better knowledge of the powers of the instrument may hereafter overcome.

Captain N. J. Holmes has filed a specification* setting forth the merits of a new signalling and rescue light for maritime purposes. He prepares crude phosphide of calcium by heating phosphorus with finely divided chalk, thus obtaining a mixture of the phosphide with some phosphate of calcium, which generates phosphoretted hydrogen when treated with water. The phosphide is enclosed in certain metallic drums so constructed that water is automatically allowed to flow in, proper escape being allowed for the gas which is liberated and which immediately ignites on issuing into contact with the air. One advantage of this light for signalling and other purposes is that it is inextinguishable by wind or rain. Moreover, inasmuch as the water

* No. 3142, 1877. Filed February 16, 1878.

allowed into the apparatus admits of measurement, known volumes of gas are obtainable and may be adapted according to the purpose intended.

G. Brügelmann* states that when the nitrates of calcium, strontium, and barium are heated in porcelain flasks to a temperature beyond that at which decomposition occurs, the corresponding oxides are obtained in a crystalline form (of the regular system). The crystals of lime are cubes and take up water and carbonic anhydride much less readily than amorphous quicklime.

The current number of Virchow's *Archiv* contains a paper by Guttmann and Fraenkel concerning the antiseptic properties of peroxide of hydrogen. They observe that it preserves urine and meat infusions from putrefaction, keeping them free from bacteria for months, and further that it prevents the fermentation of grape sugar solutions. These observations allow of but one critical remark: they are correct, but they are not original. In a report read by Mr. Kingzett at the Pharmaceutical Conference of 1876, he described† similar experiments in explanation of the disinfectant and antiseptic properties of the products of the limited oxidation of essential oils. The *Lancet*, however, seems to have been unaware of this fact, and in a long leader does honour to Guttmann and Fraenkel for their originality of conception and capability of research. This is but a common instance of the manner in which all chemical work done at home is neglected by the medical journals of this country, but it would be better for chemistry, and medicine too, if our contemporaries condescended to do credit to English scientific workers and their labours.

In a paper on the proximate composition of certain volatile oils,‡ by G. Bruylants, it is shown that oil of tansy contains 1 per cent of terpene ($C_{10}H_{16}$), boiling at 155° to 160°; 70 per cent of aldehyde ($C_{10}H_{16}O$), isomeric with laurel-camphor; and 26 per cent. of an alcohol ($C_{10}H_{18}O$) boiling at 203° to 235°.

Valerian oil also contains a terpene and a similar alcohol, together with its formic, acetic, and valeric ethereal salts, and the ether $(C_{10}H_{17})_2O$. The compound $C_{10}H_{18}O$ is isomeric with borneol, and by suitable treatment gives a terpene, which, when oxidized with chromic mixture, yields camphor, $C_{10}H_{16}O$.

R. Hennig§ describes a preparation of artificial champagne as follows:—A wine of the Rheinpfalz, Rheingau, or Neckar, is freed from albuminoids by tannic acid, excess of which is then removed by precipitation with gelatin, after which the wine is left at rest for eight days. It is then filtered through kaolin and charcoal, and flavoured by the addition of sugar, tartaric acid, glycerine, and cognac or spirits of wine. An agreeable aroma may be imparted to the wine by the use of some extract, such as extract of violet or orange-blossom water. The flavoured wine is again filtered and saturated with carbonic acid, under a pressure of five atmospheres. The same author states that genuine French champagne contains 0·6 free acids, 8·5 alcohol, 8·5 sugar, 0·8 to 1·0 glycerine, and 12·5 per cent. of extractive matters.

The poisonous influence of cashew seeds exhibited on horses in the wet season of Jamaica is said to be due not to any specific poison contained in them, but to the state of fermentation to which the seeds are subject. This process continues in the horses' stomach, producing tympanitis and its consequences.*

E. Schmidt† has re-examined the alkaloids of the seeds of the *Veratrum Sabadilla* and has obtained a crystalline base, together with a second resinous one, which he supposes to yield a third base which is amorphous. The crystalline substance he regards as the principal constituent, and he assigns to it the formula $C_{32}H_{50}NO_9$. This substance melts at 205° and yields amorphous salts. He supports his formula by analyses of the sulphate, hydrochloride, a gold salt, and a platinochloride.

In a paper recently read before the Manchester Literary and Philosophical Society, by Mr. Schunck, "On Indigo-blue from *Polygonum tinctorium* and other plants," the author mentioned a fact of great interest to physiological chemists. He had prepared an alcoholic extract of dried woad leaves in which the indican (the principle which yields indigo-blue and a kind of glucose on hydration) had, on long standing, become partially decomposed, and on evaporation of the extract a quantity of tyrosine was obtained. On a previous occasion the author had met with leucine, and he is of opinion that both are products of decomposition of indican under conditions yet to be ascertained. Of course it may be that the tyrosine was pre-existent in the plant, or what is not more unlikely that both the indican and the tyrosine had been produced by the breaking up of some albuminous substance by hydration and oxidation. Tyrosine and leucine are both known to be produced in such decompositions and are accompanied by indol (as shown by Nencki), a substance related to indican.

It may be of interest to those readers of these columns who smoke, to learn that the annual consumption of tobacco now amounts to 2,000,000,000 lbs., and *Cope's Tobacco Plant* remarks that if the leaves were made into a roll two inches in diameter, the tobacco-serpent following the direction of the equator, would wind around the earth thirty times. Truly this world of ours is under a cloud, but it is getting in years too, and it may be that tobacco is balm to its old age. The world *is* getting old, for Sir William Thomson has said so. He estimated that probably not more than one hundred millions of years have passed since the surface of this earth was habitable, and yet the age of man is but threescore years and ten! However, a critic (Mr. T. Mellard Reade) has characterized‡ Sir William's estimate as a "tremendous superstructure of inference."

The *Lancet* of the 22nd inst., calls attention to an outbreak of trichinosis in Vienna, caused by the consumption of some American hams recently imported into that city, and infested with trichinæ. Now, as such hams are being largely used in this country it is most important that such a danger should be emphatically pointed out. Better still would it be to devise some process for turning out the trichinæ or destroying them in their very habitation.

Under the title of *The Electrician* a new paper has recently made its appearance as a weekly journal of electricity and chemical physics. However worthy of success it may be, one is reminded of the fact that there is a *late* electrician. Still it starts with the

* *Ann. Phys. Chem.* [2], ii., 466—475.
† *Pharm. Journ.*, September, 1876, and *Moniteur Scientifique*, July, 1877.
‡ *Deut. Chem. Ges. Ber.*, xi., 449-456.
§ *Chem. Centr.*, 1878, 110-112.

* *Journal of Applied Science*, June 1, 1878.
† *Arch. Pharm.* (3), x., 511-532.
‡ *Geological Magazine*, May, 1878.

advantages incident to the introduction of the telephone, the microphone and electric street-lamp lighting and that is something!

Speaking of the microphone reminds us of Mr. Seabroke's letter recently published in *Nature*, in which he writes "I doubt whether 'microphone' is a proper term for describing the instrument. In gently brushing the stand of the instrument, sound is heard in the telephone, but it does not at all follow that what we hear is a magnified reproduction of the brushing sound; for if the rapidity of the vibration or motion produced by brushing is insufficient to produce sounds, still they may move the charcoal sufficiently to produce articulations of current, each of which may be able to set up vibrations in the telephone plate in its own period, or a modification of it giving what I call the jarring sound. If therefore we have this sound, we know that either the microphone is exposed to sounds so loud as to produce complete breaks of contact or there is a motion going on affecting it of sufficient rapidity to be audible."

Students of the microphone might perhaps make something out of the following fact, which must have been observed by many. If when stretched at length in a bath, one throws back the head far enough to allow the ears to be submersed in the water, keeping the mouth above it, then each expiration in breathing is heard with the distinctness and roar of thunder. In such case it appears every man is his own microphone, and science has at last very properly gone in for a bath. It has taken such rapid strides of late years that in its haste it has become heated and unclean! It is curious to remark that man is microphonetic by nature, his words and deeds invariably sounding greater to his own ears than to those of others.

With reference to a mixture of citrate of iron and quinine with aromatic sp. of ammonia, No. 78, commented on very recently in "The Month," a correspondent, again brings the subject under discussion by stating that if the citrate of iron and quinine be dissolved in the aromatic sp. of ammonia, and the bromide of potassium previously dissolved in the water be gradually added, the mixture can be dispensed without a separation of the quinine. It is only necessary to repeat here that if the ferri cit. c. quin. be of the B.P. standard and the sp. am. arom. of the proper strength, a separation of the quinine will take place, and when this does not occur the quality of the preparations or the accuracy of the dispenser should be doubted.

A remedy for the insolubility of salicylic acid in water, No. 108, has been suggested since the remarks in the last month; that is, the addition of borax in the proportion of two grains to each ounce of the solution. But this addition, although it results in the formation of a clear solution, cannot be recommended for adoption by the dispenser; still it may very properly be brought under the notice of the writer with the view to obtain his sanction to such an addition. It is extremely desirable that the ingredients of a prescription should be so arranged as to result in an elegant combination. Any suggestion in this direction is of value, and may very properly be brought under the notice of the medical profession, but the prescription as written must not be tampered with for the sake of elegance, excepting with the concurrence of the writer, and the addition of borax to a solution of salicylic acid in order to make the combination an elegant one should not be adopted without medical sanction. At the same time such suggestions in the pages of the dispensing memoranda appear in their proper places, are not without value, and may bear fruit in the future of pharmacy.

Reference has also been made by a correspondent to the remarks on syr. ferri superphosph. co. Inquiry has since been directed to the author of that paper with this result. Syr. ferri superphosph. was exhibited as a new remedial agent in the exhibition of 1851, and has been since that time in constant use, and also largely exported to the United States. On it was founded Parrish's preparation which has since aquired European celebrity, but no preparation save the one alluded to has ever been called syr. ferri superphosph. That which the writer of the prescription has written is commented on; what he intended, if there is reason to believe that it is different to that which he has written, should be ascertained from him personally. The object of the remarks in "The Month" on dispensing is to embody in its pages *general principles* for the guidance of dispensers. The preparation alluded to appears to be by no means so obscure as might be concluded from the correspondents' observations.

The first prescription calling for notice is that of No. 112, containing iodide of iron and iodide of potassium; for this an excipient capable of making a plastic mass is required. Crumb of bread will make this very readily into a satisfactory mass, which may then be rolled into pills. If the bread be too new the mass may be rather soft. It should be chosen firm, if not disposed to be crumbly. About 20 grains will be sufficient for the sixty pills. Glycerine of tragacanth, so generally useful, if employed here will make the mass too soft. Crumb of bread is readily obtainable and a very valuable excipient in cases of compounds otherwise very intractable.

Formerly when there existed three pharmacopœias in the United Kingdom, prescriptions were frequently met with such as that of No. 113, pil. rhei co. xij, without the size of each pill being indicated, all the pill masses of the Edinburgh Pharmacopœia being made into certain sized pills, for instance that of pil. rhei co. into 5 grain pills. From this circumstance originated a practice, at one time very common but now rarely met with in England, of ordering a pill without giving the size.

The prescription No. 114 may be dispensed perfectly transparent and without deposit, but of a dark colour, by dissolving the sulphate of iron in the inf. cascarillæ, adding the sp. æther. nit. and subsequently the acid. hydrocy. dil. The mixture is darker than the infus. cascarillæ would be, from the action of the tannin of the inf. cascarillæ on the ferri sulph., but there is no deposit. It is presumed that fresh infusion which has stood long enough to become clear will be used in the preparation of this prescription. There is a certain amount of deposit from inf. cascarillæ after being made, and if the mixture be prepared previously to this being deposited a flocculent matter will necessarily subside from the infusion itself.

Inquiry No. 115 refers to B.P. raisins. What kind of raisins is it correct to use in those B.P. preparations where raisins are ordered? Referring to the botanical description in the B.P., the raisins are thus described, "The ripe fruit of *Vitis vinifera*, Linn. —the grape vine. Dried in the sun or with artificial heat; imported from Spain." In commerce there are four kinds of raisins commonly met with—Muscatel, Valencia, Elemi, and Sultana; the two latter are from Smyrna, and this circumstance at once excludes them. The choice now lies between Muscatel and Valencia. Either may be used, but the Valencia are generally employed. As raisins have no medicinal properties and are only required for the saccharine matter they contain, it may be questioned if the Elemi raisins from Smyrna are not the best suited for pharmacy. These raisins are specially prepared and are sent to this country chiefly for export to Australia and other colonies. They are more luscious than the Valencia raisins and are generally met with in a better condition, being subjected to a special process before being dried, which preserves them during a sea passage of many months on their way to Australia. The Elemi raisins are very like Valencias; they have seeds about the same size; but the B.P. instructions if rigidly adhered to exclude them from use. It is not correct to say that sultanas have no seeds, but as compared with those of other raisins they are very small.

No. 116 refers to the dose of Ol. Santal. Flav. It is usually given in doses of ten to fifteen minims, but on this subject little need to be added to the practical remarks of Mr. Henry Brown. In whatever dose the ol. santal. flav. is prescribed it is not for the dispenser to use liq. potassæ to form an emulsion. The suggestion of liq. potassæ intrudes a medical opinion which the pharmacist is not competent to give. He may use mucilage and syrup for the suspension of the oil and suggest liq. potassæ to the writer of the prescription.

No. 117 contains the question, When tr. cardamoms is ordered in a prescription, which is correct to dispense, tr. card. simp., or tinct. cardam. comp., not knowing the prescriber's intention? The tr. cardam. (simp.) occupied a place in the Ph. Lond. 1836, and the Ph. Edin. 1841, but was omitted in the B.P. 1867. When it did occupy a place in the pharmacopœia it was not such a favourite as the compound tincture, and ten years having now elapsed since the B.P. 1867 was issued omitting the simple tincture, there is fair presumption that when tr. cardam. is written that the compound tincture is intended; at the same time it would be more satisfactory to determine the point definitely by reference to the writer, a procedure which would remind him to add the "co." in future prescriptions if he intends the compound tincture to be used. It will be a red-letter day for pharmacy when simple and compound tinctures of the same drug, with little save colour to distinguish one from the other, cease to exist, and when the preparations allowed to remain are invigorated by an occasional judicious pruning.

The question is asked in No. 118. When pulv. scammonii is ordered, what should be dispensed, pulv. rad. scammon., or pulv. gum. scammon.? Referring the inquirer to his pharmacopœia he will there find that scammony is a gum-resin obtained by incision from the living root of *Convolvulus Scammonia*, chiefly from Smyrna and Asia Minor. The juice collected in shells is suffered to concrete; this is scammony, and it only requires to be reduced to powder to form what, by-the-bye, should be written for the sake of consistency either pulv. scammonii or powdered scammony. The rad. scammoniæ is only employed for the production of resin. scammon. Scammony enters into four preparations of the British Pharmacopœia, whilst the resin has a place in two and in one in the appendix. The scammony root is official in the B.P., but only for the preparation of the resin.

Question No. 119 has reference to certain B.P. preparations, whether they should, when prepared, be made up to a particular quantity or otherwise. When directed, as in all tinctures, the yield should be made up to the prescribed quantity, but in some other preparations and in all infusions it is not so ordered, the directions are to strain or filter, and in no case should the product be made up to a given quantity unless specially ordered and when such directions are appended to the preparations. On this point the pharmacopœia instructions are quite clear. It is an important point, and it is difficult to understand how those instructions could have been so misunderstood as to occasion a doubt in the mind of any one whose attention had been directed to the subject.

The prescription No. 120 should be prepared by dissolving the ferri citras in about the same quantity of water and then mixing it with the tinct. quinæ, to this mixture the tr. nuc. vom. should be added. The result will be an opaque mixture which on standing separates into two nearly equal portions, the upper clear and dark, the lower turbid. It should have a label to shake the bottle previous to taking each dose; if taken in water it becomes clear. In its present form it is not an elegant mixture. If made with an equal quantity of water into a 4-oz. mixture it could be sent out more clear, tolerably stable, and more elegant; but this alternative must receive the sanction of the writer.

In No. 121 the best form is required for tr. eucalyp. glob. Squire gives a formula supplied by Savory and Moore—leaves 1, bark 1, proof spirit 10. Dose 1 to 4 drachms. In a lecture on Eucalyptus Globulus (*Pharm. Journ.*, May 4, 1878), Professor Bentley, in alluding to preparations of different parts of the plant, says:—"The bark is also said to possess similar properties in this respect to the leaves. Several preparations, such as tinctures, etc., of the bark and leaves are now exhibited, but the best form of administration is probably the alcoholic tincture." It will be observed that the alcoholic tincture is recommended by the lecturer, whilst in the formula quoted proof spirit is given as the menstruum; this difference is sufficient to account for the more or less opacity of a tincture when mixed with water. If the leaf of the eucalyptus be held up to the light, its numerous glands charged with oil will be readily observed, and the presence of so much volatile oil in the leaf would indicate rectified spirit as the best menstruum for the tincture.

When the medicinal agent is an essential oil or resin, whether in leaves or bark, rectified spirit is a more suitable solvent than proof spirit, and when one tincture of such a drug on being mixed with water becomes more milky than a second sample, the probability is that the one is made with rectified the other with proof spirit. The time will probably arrive when the hard and fast line between rectified and proof spirit will give way to relative proportions of each suited to the drug the active principles of which it is employed to eliminate. Our present practice may be the more convenient but it is the less scientific, and a step in this direction is already anticipated by the authors of the Homœopathic Pharmacopœia.

NOTE ON THE ALKALOID SOPHORIA.*

BY H. C. WOOD, M.D.

Some months since I gave notice† of the finding of an alkaloid having toxic properties in the bean of *Sophora speciosa* of Texas. During the past winter I have made some further study of the bean, which, although it does not exhaust the subject, has led to results worthy of publication. Other pressing engagements will prevent my giving more time to the matter, and it affords me pleasure to turn it over to the far abler hands of Professor Wormley, who hopes to make a thorough investigation. This much of apology. In the present state in which it was obtained sophoria is a transparent liquid having a highly alkaline reaction, freely soluble in water, somewhat so in ether, and very freely so in chloroform. When quite pure it is probably colourless, but, like other liquid alkaloids, it is very prone to undergo change, and I have never seen it free from a brownish tint. Its chloride crystallizes very readily, and appears to be a stable salt. With chloride of platinum it gives beautiful and peculiar crystals. When an acid is added to its watery solution drop by drop, very marked turbidity is produced, clearing up as more of the acid is put in. Crystallization is favoured by not allowing the reaction of the solution to become distinctly acid; and there is reason for believing that the crystalline salt is basic, although I cannot speak positively upon this point. The most characteristic test is that with the tincture of the chloride of iron, a deep blood-red colour being produced.

I have tried various processes for preparing this alkaloid, but the only one which has yielded me any results is as follows: The powdered beans are first well moistened with strong alcohol and allowed to stand for two hours, the object being to coagulate the albuminous and gummy principles of the bean as much as possible. In order to avoid the extraction of the very abundant colouring matter of the shell, water not too strongly acidulated with muriatic acid is added in considerable quantity after the second hour, and maceration allowed to continue for a week. The expressed liquid is concentrated on a water-bath, and when cold rendered decidedly alkaline with carbonate of sodium, and agitated with an equal bulk of chloroform. On standing, the mixture separates into two layers, the lower being an emulsion of chloroform. This, after twenty-four hours, is removed by decantation, or with a pipette, and the supernatant liquid treated with chloroform, as before.

The two emulsions of chloroform having being mixed, are thoroughly agitated with a half bulk of water acidulated with muriatic acid. By this procedure the alkaloid is more or less perfectly reconverted into the stable chloride. The chloroform is then by distillation recovered, and the mixture evaporated at a low temperature to the consistency of a thick syrup, care being exercised that the reaction be at all times decidedly acid. To the syrupy liquid strong alcohol is added, and the precipitated gum separated by filtration. The clear liquid is then evaporated upon a water-bath until all the alcohol is driven off and an impure solution of the chloride obtained. This is rendered strongly alkaline with carbonate of sodium, and extracted twice with an equal bulk of chloroform. The chloroform now separates readily, or by means of some of the manœuvres known to every worker in alkaloids, can readily be coaxed into doing so. It is then allowed to evaporate spontaneously. The impure alkaloid left behind is to be purified by solution in a small quantity of water acidulated with muriatic acid, filtering, rendering strongly alkaline with carbonate of sodium and extracting with chloroform. It is probable that this process would be not only simplified but also improved by extracting the first concentrated infusion with strong alcohol, and thereby avoiding the first use of chloroform. The process is, however, here given as it was practised.

When given to frogs this alkaloid produced the symptoms which I detailed in my previous note. I found it to act much less powerfully upon mammals than I expected. Three grains of it hypodermically failed to very seriously affect a dog, but killed a cat in a short time.

* From the *American Journal of Pharmacy*, June, 1878.
† See *American Journal of Pharmacy*, January, p. 33.

A POISONOUS AUSTRALIAN LAKE.*

BY GEORGE FRANCIS.

This year the lakes forming the estuary of the Murray have been very low and the water unusually warm. The river is very low and the inflow to the lakes very slight and having a temperature of 74° F. Lake Alexandrina—on calm days surface 76° depth 73°—during breezy temperature is 72°. A conferva that is indigenous and confined to the lakes has been produced in excessive quantities, so much so as to render the water unwholesome.

It is, I believe, *Nodularia spumigera*, allied to protococcus. Being very light, it floats on the water except during breezes, when it becomes diffused. Thus floating, it is wafted to the lee shores, and forming a thick scum like green oil paint, some two to six inches thick, and as thick and pasty as porridge, it is swallowed by cattle when drinking, especially such as suck their drink at the surface like horses. This acts poisonously, and rapidly causes death; symptoms—stupor and unconsciousness, falling and remaining quiet, as if asleep, unless touched, when convulsions come on, with head and neck drawn back by rigid spasm, which subsides before death. Time—sheep, from one to six or eight hours; horses, eight to twenty-four hours; dogs, four to five hours; pigs three or four hours.

A *post mortem* was made on a sheep that had thirty ounces of fresh scum administered by the mouth: death was long coming on—about fifteen hours; examination made six hours after. Stomachs: none of the green scum left, all absorbed; dry grass food in stomachs. Abdominal cavity contained two pints of yellow serum; heart flaccid, but not pale; great effusion of serum around it. Lungs, liver, kidneys, and substance of brain healthy and normal, but the dura mater congested. Blood throughout veins and arteries and in both ventricles black and uncoagulable, neither did it become scarlet on exposure to the air. Many sheep that died, on being opened, presented the same appearances, all being without any sign of its presence in the stomachs.

This shows that the plant is rapidly absorbed into the circulation, where it must act as a ferment and cause disorganization. The cattle will not touch the puddles where the scum has collected and gone putrid. Thus all they take is quite fresh, and the poisoning is not caused by drinking a putrescent fluid full of bacteria as at first supposed. When this scum collects on the banks and is as rapidly left dry, it forms crusts of a green colour. This has gone out of the Murray mouth into the ocean and been wafted ashore, forming thick beds of green stuff from a few inches to twelve inches thick. When, however, this scum is left in wet pools and puddles it rapidly decomposes, giving off a most horrid stench like putrid urine, or archil in process of manufacture; but previous to its getting into that state it emits the smell of butyric acid, smelling like very rancid butter.

There exudes from this decomposing matter a blue pigment which has remarkable properties. Sample tube 1 contains the fluid as strained off from the scum and will be found full of bacteria. No. 2 is the same with glycerine, and filtered to separate the bacteria.

This fluid is remarkably fluorescent, being red by reflected light and blue by transmitted light. Spectrum a broad and deep band total at top in the red, but shading off to green, quite cutting off orange and yellow.

* From *Nature*, May 2, 1878.

Chemical properties:—Heat destroys colour; sulphuric acid no action; nitric acid reddens; hydrochloric acid, the alkalies, and ammonia, destroy colour; chlorine and ozone bleach; light but little action, yet sunlight gradually bleaches; dries to a mass, retaining colour; soluble in water, glycerine, and weak alcohol. I think this is allied to the colouring matter of some lichens, is a product of decomposition, and not pre-existing in fresh plants. Its fluorescent powers are remarkable, and the most powerful I have ever met with.

THE BOTANICAL SOURCE OF ARAROBA.*

The following information respecting the tree which yields araroba, and the manner in which that substance is obtained from it, is from some notes supplied to the *Journal de Thérapeutique* by Dr. Rameiro A. Monteiro, who has recently visited the district in which the tree is met with.

The tree from which araroba is extracted is known in all the places where the industry is carried on under the name "*angelim amargoso*," or "bitter angelim." Why it is called "angelim" is unknown. It is a neighbour of another tree which yields a product having vermifuge properties, the *Andira anthelmintica*, Benth. (*Geoffræa vermifuga*, St.-Hil.), from which, however, it differs in appearance, although both belong to the Leguminosæ. The term bitter is applied to it because its wood is bitter, like cinchona, and persons who cut down the trees are sensible of a bitter taste which is due to particles which become detached from the inner layers of the wood. There is also an "*angelim doce*" (*Andira vermifuga*, Martius) and an "*angelim pedra*" (*Andira spectabilis*, Sald.), which also belong to the Leguminosæ. The powder obtained from the bitter angelim is invariably called "araroba."

The tree is met with in great abundance in the forests of Camamu, Igrapiuna, Santarem, Taperoa, and Valença in the province of Bahia. It appears to prefer low and humid spots, but it is also met with in the more elevated regions when these are not very arid.

At whatever season the tree is cut, provided it be of the necessary age, araroba is found; no particular time of the year is preferred for the operation, which is carried on without regularity or method. The tree is one of the tallest in the forests in the south of the province; in fact there is only one, popularly called the "oleo" (*Microspermum erythroxylum*) which rivals it in height, and this belongs to the same family. The bitter angelim is erect, smooth, and when it attains its full development it measures 1 to 2 metres in diameter, and 20 to 30 metres from the ground to the small branches. The tree from which Dr. Rameiro cut a section at a height of 2 metres from the ground measured 24 metres 20 centimetres up to the first branches. The bitter angelim has no other known use than to furnish araroba; the old trees are preferred because of their greater richness.

The araroba is contained in clefts or cavities, more or less narrow, in the wood. The clefts traverse the wood in the direction of the diameter, and are prolonged through the whole extent of the trunk, becoming narrower towards the upper part. Sometimes small clefts also occur parallel with the primary ones. In order to extract the araroba it is the practice to hew down the tree, cut it across into small sections, and split these longitudinally, which is favoured by the fibre of the wood and the large clefts, upon the surfaces of which the araroba is deposited.

The araroba is of a yellow colour, comparable to powdered sulphur, though a little darker and devoid of lustre. By the action of the atmosphere it loses little by little its fine colour, so as sometimes to resemble aloes and at others rhubarb, and finally takes a deep purple colour. The powder is found upon both sides of the clefts, and the workmen scrape it off with the sharp edge of an axe. Commercial araroba is therefore very impure, as it is always mixed with a considerable quantity of ligneous particles, which in the green state are easily removed with the araroba. Some that Dr. Ramiero himself removed carefully was found to be free from woody particles.

The workmen employed in the extraction of araroba suffer from irritation of the conjunctiva, which sometimes passes into inflammation of that membrane, and the face will remain swollen and erythematous for some time; but for the irritation caused by araroba to produce these effects it requires that its action shall be prolonged during a day or more.

It is quite certain that araroba is not found in the medulla, as has been generally supposed, but is deposited as a concretion in the clefts before mentioned.

Araroba has long been employed in the treatment of ringworm (*Herpes circinatus* and *Herpes tropicus*), but how long is not known. It is also said to be employed in killing fish, by throwing it into the lakes and rivers.

Dr. Rameiro did not ascertain the exact period of the year when the bitter angelim flowers, but he learned that the flower is dark purple and the fruit is a pod. The tree is not cultivated.

* 'Répertoire de Pharmacie,' vol. vi., p. 248, from the *Journal de Thérapeutique*.

STRYCHNIA INCOMPATIBLE WITH BROMIDE OF POTASSIUM AND CERTAIN OTHER SALTS.*

BY A. B. LYONS, M.D.

Having occasion recently to dispense a mixture in which strychnia was combined with bromide of potassium, I observed that when the bromide was dissolved in a clear neutral solution of the strychnine the fluid at once became turbid from the separation of a bulky precipitate, which failed to redissolve on the addition of a few drops of dilute acid. The precipitate, which under the microscope was seen to consist of minute acicular crystals, proved to be a salt—doubtless bromide—of strychnia.

When the proportion of strychnine did not exceed one in two thousand the crystals separated from the solution only after some time, unless enough of the bromide were added to make a nearly saturated solution. It is easy to see what danger might arise from this behaviour of a solution containing any considerable quantity of strychnia.

In fact my attention was called to the subject by a case of serious poisoning by the last dose in a bottle prepared after the following prescription:—

℞	Strychnine	grs. ij.
	Bromide of Potassium . . .	ʒij.
	Syrup, Water, āā	℥iv.
M.		

This prescription, when first prepared *secundem artem*, forms a clear mixture, which, however, in a short time becomes turbid and eventually deposits a considerable portion of the strychnia. Hence, if the mixture were not well shaken whenever used the last dose might well be a dangerous one. I found by experiment that bromide of sodium, iodide of potassium, and even chloride of sodium would cause a separation of strychnia from its solutions. Even so small a quantity of common salt as 10 per cent. produced a decided precipitation in a solution of strychnine containing one grain to the ounce.

Nitrate of potassium and sulphate of sodium seemed to have no effect when dissolved to saturation in strychnine solutions of this strength.

The practical conclusion to the physician will take shape in a rule something like this: Never prescribe strychnine in solution in combination with any considerable quantity of iodide, bromide or chloride, and if such a combination is prescribed at all be sure to direct the patient always to shake the vial well before taking a dose of the mixture.

* *Detroit Medical Journal.* From the *Canadian Pharmaceutical Journal*, April, 1878.

EMULSIONES OLEOSÆ.*

BY LOUIS VON COTZHAUSEN, PH.G.

In oil emulsions oil and water are mixed uniformly by means of gum, a mixture of gum and sugar, the yolk of eggs or alkalies. If properly made, there is neither any uncombined oil nor a separation into layers perceptible. They are universally considered more palatable, more acceptable to the stomach, and of a nicer appearance than shake-mixtures, and thus combine the virtues of efficacy and elegance. There are few preparations to which as little attention is devoted by the average druggist, in which he is less particular and skilled, and which he considers of minor importance, not considering that a poorly-made emulsion will certainly injure his reputation considerably, showing either his incompetency or his carelessness, or a little of both; while, on the other hand, if properly made) an oil emulsion will prove a splendid card for the pharmaceutist who dispenses it. We should always endeavour to give our preparations an elegant appearance, as long as it will not interfere with their therapeutical effects, but never follow the example of those who (for instance by filtering cloudy solutions containing insoluble ingredients) sacrifice the medicinal virtues rather than dispense an unsightly preparation. Physicians quite frequently objecting to the presence of acids in solutions, or of gum or any other emulsionizer in mixtures containing oil and water, prescribe shake mixtures. In such cases, of course, we are not authorized under any consideration to endeavour to improve upon their recipe by additions of our own; while on the other hand, when the practitioner desires an elegant and effective medicine it is our duty to try our best to furnish a perfect preparation. Looking over a prescription file we often notice that the doctor leaves it for us to decide how much of some ingredients is necessary to obtain a certain result, and particularly how much gum or other emulsionizer is required to prevent a separation of oil in a mixture. I happened to be present during a discussion between two druggists, one of whom claimed that an emulsion could be made by triturating the whole amount of oil prescribed, gum arabic and a certain portion of water, thrown together into a mortar at once; while the other considered this ridiculous, stating that every apprentice knew that it was necessary to form a mucilage first with gum arabic, sugar, and some water, and then add the oil and balance of the water gradually. The particular oil they had reference to was Oleum Morrhuæ. This induced me to make the following experiments, emulsionizing cod liver oil, copaiva, castor oil, and oil of turpentine, respectively.

1. In making 5 ozs. of emulsion of cod liver oil, let us follow the directions of the 'Pharmacopœa Germanica,' which orders emulsiones oleosæ to be made with 2 parts of oil, 1 of pulverized gum arabic, and 17 (seventeen) parts of water, unless otherwise directed by the physician. I took ol. morrhuæ, f℥iv; pulv. gum acaciæ, ʒii; aqu. dest., f℥iv, poured the oil and water on the gum in a mortar, triturated them well for a few minutes, when a good emulsion was formed, and then added sufficient water to make f℥v. This emulsion remains unchanged after keeping it six weeks at a constant temperature of 70° F.

2. I then reduced the quantity of water one-fourth, mixing at once—ol. morrhuæ, f℥iv; powd. gum arabic, ʒii; aqu. dest., f℥iii, and then diluted with the balance of water; the result was the same. This is the favourite method of most German apothecaries, and is considered by them better and surer to bring success than the first. I have made very many emulsions by it with various oils during a number of years, and never failed. There are now on hand four emulsions containing 50 per cent. of cod liver oil, castor oil, turpentine and copaiva, respectively, made by the second method about four weeks ago. So far they are still, as in the beginning, elegant in appearance, and show no inclination of spoiling or separating although kept at a constant temperature of 70° F. Emulsions containing 50 per cent. of oil, made by the first method about two weeks ago, likewise appear unchanged so far.

3. A large proportion of gum is not objectionable in most emulsions, as in copaiva emulsions, preventing the latter from having a too strong purgative effect; in others, however (as castor oil emulsion), care must be taken, as a large proportion of gum would counteract the effect of the oil to a certain extent. I therefore reduced the quantity of gum arabic to one-half of its former quantity, thus making the proportions, oil 4 parts, gum arabic 1 part, water 3 parts. Emulsions of cod liver oil, castor oil, copaiva, and oil of turpentine, made in this proportion, at first presented as elegant an appearance as those containing double the quantity of gum, and remained unchanged for three days, then the emulsion of copaiva began to separate into two layers, the lower one being only about one-fifth of the whole mixture; on being shaken they readily reunited, again forming, apparently, a perfect emulsion, which, however, began to separate again in the course of twenty-four hours. The emulsion of cod liver oil began to separate a little at the end of four days, that of castor oil after six weeks, while the turpentine emulsion is still unchanged.

4. An attempt to reduce the amount of gum to one-fourth the original quantity, so as to bring the proportions—oil 8 parts, water 6 parts, and powd. gum arabic 1 part, proved successful with cod liver oil, turpentine, and castor oil, but gave an unsatisfactory result with copaiva, even after considerable constant trituration. The emulsions of cod liver oil, turpentine, and castor oil separated on standing for twelve hours, not showing any separated oil globules floating on top, but two distinct layers, the upper one of which still retained the appearance of a perfect emulson, while the lower one was thinner and lighter in colour; shaking slightly again mixed them perfectly. This proves that ʒi of gum arabic to the ounce of oil will only answer satisfactorily when the emulsion is to be used in a short space of time.

5. An emulsion made by shaking together in a bottle equal parts of cod liver oil and of the officinal mucilage of gum arabic was a perfect success, not separating in the least. After standing for three weeks and two days, a separation into layers slowly commenced.

6. Cod liver oil, f℥i, the yolk of one egg, and f℥vi of aq. dest., mixed intimately by trituration, yielded a yellowish-white perfect emulsion, which could be diluted without separation, and remained unchanged for seven hours. It then separated into two layers, which reunited on shaking. Oil emulsions made by any of the mentioned processes will bear dilution with water, and the addition of syrups or tinctures after being perfectly combined.

7. Parrish's formula for cod liver oil mixture reads as follows: Take of cod liver oil f℥vi, lime-water ℥ix. To the lime-water in a pint bottle add the oil, and shake, etc. I mixed f℥vi of cod liver oil and f℥ix of lime-water, and, after considerable incessant shaking, obtained a very satisfactory emulsion, containing 40 per cent. of cod liver oil, which remained unaltered for five days. It then commenced to separate into two layers, the upper one in this case consisting of a small amount of oil, while the lower one, which was at least $\frac{1}{12}$ of the whole mixture, still appeared to be a perfect emulsion. But very little shaking was required to reunite them.

8. Experiments made with different formulas for "Emulsion of cod liver oil and lactophosphate of lime" gave me the following results: By following the directions of the formula published by Mr. Shinn (*Amer. Jour. of Pharm.*, March, 1873, p. 135) I obtained a nicely flavoured emulsion. An attempt to mix the oil, water, and gum in his proportions by throwing them together into a mortar and triturating them well, proved equally successful; the emulsion in this case, however, separated after standing twenty-four hours, there being a narrow

* From the *American Journal of Pharmacy*, June, 1878. Read at the Pharmaceutical Meeting, April 16, 1878.

layer of oil visible floating on the top of the emulsion. Shaking in this case also reunited them.

Mr. Chiles' formula (*Amer. Journ. of Pharm.*, March, 1873, p. 104) also deserves mention, furnishing if properly adhered to, a very satisfactory result. There is another formula for this preparation, usually used by me, which seems to be preferred by many physicians. It is pleasant, acceptable to the most delicate stomach, and will not separate, if properly made.

The recipe is as follows:

℞ Ol. Morrhuæ . . . . f℥iv.
Pulv. Sacchari albi,
„ Gum Acaciæ . . . . . āā ʒss.
Ol. Gaultheriæ . . . . gttxxvi.
„ Menth. Pip. . . . . . . gttvi.
Aq. Dest. . . . . f℥iv.
Misce, fiat emulsio, cui adde,
Syr. Lactophosphatis Calcii . . . f℥ii.

Mix the ethereal oils with the cod liver oil; make a thick mucilage with the gum, sugar and a small quantity of distilled water; gradually and carefully, with constant trituration, add the oil and the balance of the water alternately.

The syrup of lactophosphate of lime is kept by me in a separate bottle, and added in the proper proportion before dispensing. I have never found any trouble in keeping it on hand during the warm season, except in one case, when the emulsion separated, which was, however, due to imperfect manipulation and too great haste when preparing it, as was proved by later experiments. This emulsion can be flavoured differently, of course, by substituting oil of bitter almonds or any other desirable flavour for the oils of wintergreen and peppermint. The syrup of lactophosphate of lime used by me was made according to the formula published by Mr. Chiles (*Amer. Jour. of Phar.*, 1873, p. 105), and seems very satisfactory.

9. A preparation prescribed much lately is "Emulsion of cod liver oil with hypophosphites." It can be easily made by substituting the proper syrup in the formula given above.

HANBURY MEMORIAL FUND.

Subscriptions Received.

Since the last list of subscriptions was published the Hanbury Memorial Fund has been brought under the notice of the foreign pharmaceutical central bodies. From nearly all of these replies have now been received, and the list will very shortly be closed. Remittances may be sent to 17, Bloomsbury Square, London, W.C., addressed either to Professor John Attfield, Mr. Michael Carteighe, or Mr. Elias Bremridge.

	£	s.	d.
Amount previously acknowledged	345	16	0
Bell, C. B.	0	10	6
Carruthers, Wm., F.R.S.	1	1	0
Christison, Sir R.	1	1	0
Dyson, W. B.	0	10	6
Franks, A.W., F.R.S.	1	1	0
Greenish, Thomas	1	1	0
Hudson, R.	1	1	0
Jeffreys, J. G., F.R.S.	1	1	0
Johanson, Magister	0	10	0
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Lotze, Gustave	1	1	0
Macdonald, A.	0	10	6
Méhu, Dr., and others	1	11	9
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Rammell, E.	1	1	0
Richardson, B. W., F.R.S.	1	1	0
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Thwaites, G. H. K., F.R.S.	1	1	0
Trimen, Dr.	1	1	0
Turner, J.	1	1	0
Tuson, Professor	1	1	0
Tylor, E. B., F.R.S.	1	1	0
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Altenberg, F.	fl.	2	0
Bibus, B. V.		1	0
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Dobler, G.		1	0
Egger, A.		3	0
Ehrmann, Dr. T.		1	0
Fidler, T.		5	0
Finkh, T.	fl.	5	0
Friedrich, E.		2	0
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Grohs, F. A.		1	0
Gross, F.		1	0
Grabensteiner, L.		1	0
Hassenstab, Dr. E.		2	0
Heindl, T. B.		5	0
Herbabny, T.		1	0
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Janofka, E.		1	0
Kluger, Dr. T. B.		2	0
Kulisch, T.		1	0
Kwisda, F.		3	0
Laska, E.		5	0
Lipp, L.		2	0
Mayer, A.		1	0
Menzel, C. sen.		5	0
Menzel, C. jun.		1	0
Molitor, R.		1	0
Moel, A.		2	0
Neustein, Ph.		5	0
Proebstl, F.		5	0
Poerhofer, T.		2	0
Raab W.		2	0
Radda, F.		2	0
Rupp, R.		1	0
Schiffner, R.		10	0
Schlosser, Dr. T.		2	0
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Seewald, Ad.		2	0
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Sichra, A.		1	0
Spirmann, W.		1	0
Steinebach		5	0
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Total value of subscriptions from Austria	£10	0	0
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Lundblad, J. C., M.D., Stockholm	5	0
Wallis, C., M.D., Stockholm	5	0
Medical Society, Stockholm	19	0
Kinberg, J.G.H., M.D., Professor, Stockholm	5	0
Morell, E., Professor, Stockholm	5	0
Lindguist, C., Stockholm	5	0
Sjostedt, G. W., Professor, Stockholm	2	0
Ericsson, C., Stockholm	5	0
Hero, N. G., Stockholm	2	0
Students at the Veterinary Institute, Stockholm	10	0
Sweden Pharmaceutical Society, Stockholm	19	0
Sweden Society of Pharmaceutical Chemists, Stockholm	19	0
Stahre, L., Lecturer of Chemistry, Stockholm	10	0
Rehn, G., Stockholm	5	0
Tengberg, A., Stockholm	5	0
Schillberg, A. J., Stockholm	5	0
Stenguist, Q., Stockholm	5	0
Enett, H., Stockholm	5	0
Nordin, J., Stockholm	5	0
Kinman, G. P., Stockholm	3	50
Lindman, Bl., Contratt Direktar, Stockholm	5	0
Schardt, C. W., Stockholm	5	0
Peterson, N., Stockholm	5	0
Pittz, G., Stockholm	5	0
Norselius, R., Stockholm	5	0
Wœrnbaum, A., Stockholm	5	0
Bœckman, A. Mvan, Stockholm	5	0
Bellguist, G., M.D., Gothenburg	5	0
Forssenius, C., M.D., Gothenburg	10	0
Amneus, A. J., M.D., Gothenburg	5	0
Kullberg, A., M.D., Gothenburg	5	0
Asplund, N. M., M.D., Gothenburg	5	0
Manten, A., M.D., Gothenburg	5	0
Westman, A. H., M.D., Gothenburg	5	0
Ljungberg, G., M.D., Gothenburg	5	0
Carlander, O. I., M.D., Gothenburg	5	0
Lamberg, C., M.D., Gothenburg	5	0
Bjorkbom, O. L., Gothenburg	10	0
Kingstrom, C. G., Gothenburg	5	0
Gren, A. H., Gothenburg	5	0
Murray, A., Gothenburg	5	0
Nilsson, H. W., Gothenburg	3	0
Lundborg, G., Gothenburg	3	0
Mossberg, C. F. W., Gothenburg	5	0
Students at the Veterinary Institution at Skara	3	0
Forssel, N. E., M.D., Skara	5	0
Nylander, O., Skara	3	0
Hofling, G. W., Skara	2	0
Walter, R., Skara	1	0
Strokink, C. G., Skara	3	0
Segerberg, E., Skara	3	0
Kjerrman, R. M., Skara	1	0
Medical Society, Ujisala	19	0
Wiberg, A., Westerock	10	0
Lindgren, J., Leind	10	0
Smith, G., Ystad	15	0
Smith, S., Ystad	5	0
Unge, C. A., Ystad	5	0
Bunth, J., Ystad	5	0
Henschen, P. W., Ystad	5	0
Brun, J., Huditsvall	10	0
Brun, J. A., Huditsvall	10	0
Brun, C. G., Huditsvall	10	0
Stenstrom, A. F., Malitta	5	0
Sandberg, A., Matala	5	0
Bjorklund, F. G., Trolltrattan	5	0
Pyhlsan, J. S., Wenersborg	10	0
Balkerhausen, R., Sundswall	5	0
Bergengren, Al	2 dollars	

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The Pharmaceutical Journal.

SATURDAY, JUNE 29, 1878.

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Instructions from Members and Associates respecting the transmission of the Journal should be sent to MR. ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements, and payments for Copies of the Journal, MESSRS. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

WHAT IS VIOLET POWDER?

THIS is a question which has probably presented itself to many persons within the last few weeks, in consequence of the extraordinary disclosures respecting the presence of arsenic in a preparation sold under this name, by the use of which it appears that a number of infant children have come to an untimely end. Whatever may have been the circumstances under which this lamentable result has been brought about, and however little reason there may be to suspect that the admixture of white arsenic was intentional, there can be no question that the occurrence has excited considerable alarm in the minds of those who are accustomed to use the article commonly known as violet powder, and this has induced the makers of violet powder to announce in various ways that their make of this article is to be accepted without distrust.

At the same time retail dealers have naturally been constrained to inquire and in some instances to examine for themselves what was the nature of the article they sold. This question has also been forced upon our consideration partly by a letter which appears in this week's Journal, partly in consequence of other communications; and it is with no small surprise that we find there is room for some considerable difference in the answer to be given to the question, What is violet powder?

We venture to believe that most members of the trade to whom this question was put would at once have said that violet powder was almost identical with the hair powder of olden times in being merely starch powder containing a little orris root powder as a perfume, or in place of this some essence of violets, and that it was on account of this scenting that the name of violet powder was used. This at any rate is the reply that we should have expected not only from those who are entitled to be called old fashioned, but also from the present students of pharmacy, and we should not have been surprised to find that a candidate who did not give that answer to the question in the examination room was regarded as not being very well acquainted with his business.

But in forming this opinion we should have been entirely in error, and it appears that in answering the question, What is violet powder? we should go wrong altogether if we allowed ourselves to be guided by old-fashioned authorities. It turns out that there is violet powder and violet powder—one kind being what we should have supposed it ought to be, viz., starch powder scented, another kind containing no starch at all, and consisting either of hydrated calcium sulphate or of a mixture of this substance with magnesia or French chalk or both.

In speaking of violet powder as being properly starch powder we refer especially to its application for nursery purposes, and do not lose sight of the fact that when this kind of violet powder is used as a cosmetic or face powder it is found to answer its purpose more satisfactorily when it contains an admixture of about 10 per cent. of powdered French chalk. Neither do we forget that some of the most expensive and highly favoured cosmetic powders employed by actresses and amateurs of the art of being "beautiful for ever" consist wholly or for the most part of hydrated calcium sulphate. No doubt there are good reasons for the use of this substance in the preparation of these artifices for the embellishment of ladies who think they might be fairer than they are naturally, and so far we have nothing to urge against its application.

These facts, however, have not in our opinion anything to do with the question now raised as to the proper composition of the violet powder used for nursery purposes.

Probably much the larger part of the "violet powder" sold is sold in penny packets, and is bought for use in the nursery. Most of this we are informed is of the kind referred to by Mr. KEITH in the Journal of the 15th inst., consisting of hydrated calcium sulphate, and, contrary to the opinion expressed by him, we have reason to believe that such violet powder is being very generally supplied throughout the country. The character of this powder is such as to justify a doubt whether it is so suitable as starch powder for use as a dusting powder to prevent excoriation. When examined under the microscope, with no very high power, it is found to consist of minute angular crystalline fragments, which certainly do not appear to promise a very soothing influence upon an already excoriated skin.

But there is another objection to the sale of this kind of violet powder—for under the light of the recent disclosures we must now recognize the fact that there are two different articles sold under that name. Whatever may be its merit, the buyer has no knowledge that what he is buying is not the same article that was formerly sold under the name of violet powder, and even the retail vendor in most instances is equally in the dark. The penny packets of this violet powder are labelled "Superior Violet Powder for the Nursery, for the Toilet," but they are not described as containing a material different from what was formerly known as violet powder, and generally they do not bear the name of the maker or any other indication of the source from which they are obtained. Most probably they are in many cases specially put up for wholesale houses to meet particular requirements.

We think it desirable that the trade no less than the public generally should be informed of these facts, that they may be in a position to decide for themselves which article they will have, the mineral powder—which appears to have become a considerable article of trade without many people knowing anything of the fact—or the preparation consisting of starch powder, which most people have known by the name of violet powder. If the former has the advantage of being cheaper or in any other way preferable to the scented starch powder to which the name of violet powder properly belongs we think it would be an injustice to prevent its being used or to throw any obstacle in the way of its sale. But let it be sold under its true designation and used with a knowledge of its nature, not under a name which has hitherto always been applied to another material and under a belief that it is something different to what it really is.

This view of the matter is one which we think the members of the drug trade should unreservedly adopt, for in no business is it so specially desirable to prevent any suspicion of the surreptitious substitution of one thing for another under circumstances which do not permit the public to judge for themselves whether they are being supplied with what they ask for or not. In this respect we are glad to see that Messrs. SIDNEY BROWN and CORY are adopting a course that leaves them free from all reproach, by guaranteeing that the penny packets of violet powder bearing their name contain only pure starch scented in the usual manner. By this means the small purchaser will be as well protected as those who are able to purchase the higher priced packets and take care that they are supplied with an article bearing the name of a maker they believe in.

It is not by any means to be wondered at that the services of the public analyst should have been brought into requisition in reference to the sale of the kind of violet powder above referred to, but if the Adulteration Act be of any practical value, we cannot conceive how the cases that have been tried this week near Manchester should have fallen through in the way they have. The uncertainty of the magisterial mind, however, affords even greater chances than the proverbial uncertainty of the law, and the dismissal of the cases brought before the Hyde Petty Sessions last Monday is not an inapt illustration of this fact. We may remark, for the information of some of our readers, that Dr. NEWTON, the Chairman of the Bench, is the same magistrate who became distinguished in connection with some milk of sulphur cases a year and a-half ago. Since that time, however, he may have learnt to look more kindly on hydrated calcium sulphate than he was then disposed to do, but we fear that there is not much improvement in the decisions arrived at under his presidence.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

June 19, 1878.

Present—Mr. Williams, President; Messrs. Allchin, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Taylor and Umney.

Messrs. Gilmour, Mackay and Stephenson were present as a deputation from the Board in Scotland.

Dr. Greenhow attended on behalf of the Privy Council.

MAJOR EXAMINATION.

Five candidates were examined. *Two* failed. The following *three* passed, and were declared qualified to be registered as Pharmaceutical Chemists :—

Hall, Richard Arthur ....Leigh, Lancashire.
Hugill, John Howden ....Edmonton.
Tharle, Charles Albert............Ventnor.

MINOR EXAMINATION.

Sixteen candidates were examined. *Seven* failed. The following *nine* passed, and were declared qualified to be registered as Chemists and Druggists :—

Bignold, Walter ....King's Lynn.
Brown, Thomas ....Hull.
Brown, Thomas Land............Ripon.
Gulliver, George Ekins ....Holdenby.
Hayllar, James.....................Luton.
Mason, William Drury ....Louth.
Smailes, Robert ....Grantham.
Taylor, John........................Bolton.
Williams, Robert Edwin..... ...Cheltenham.

MODIFIED EXAMINATION.

Two candidates were examined. *Both* failed.

June 20, 1878.

Present—Mr. Williams, President; Messrs. Allchin, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Taylor and Umney.

Messrs. Gilmour, Mackay and Stephenson were also present.

MINOR EXAMINATION.

Twenty-two candidates were examined. *Fourteen* failed. The following *eight* passed, and were declared qualified to be registered as Chemists and Druggists :—

Allen, Henry.......... ....London.
Booth, Charles William ....Brighouse.
Clough, Alfred ....Northwich.
Crowther, William Charles......Tickhill.
Evans, David ....Porth.
Naylor, Thomas Hamilton......Newcastle-on-Tyne.
Smith, Frederick Adolphus......Macclesfield.
West, William Painter............Liskeard.

June 21, 1878.

Present—Mr. Savage, Vice-President; Messrs. Allchin, Benger, Brady, Carteighe, Corder, Gale, Hanbury, Linford, Martindale, Moss, Taylor and Umney.

MINOR EXAMINATION.

Twenty candidates were examined. *Seventeen* failed. The following *three* passed, and were declared qualified to be registered as Chemists and Druggists :—

Higgs, Alfred Henry ....Bristol.
James, Joshua ....Cardigan.
Place, Thomas ....York.

PRELIMINARY EXAMINATION.

The undermentioned certificates were received in lieu of the Society's Examination:—

Certificates of the College of Preceptors.

Egg, George Frederick............London.
Elkins, Frank Ashby ....Northampton.
Scott, Walter H. ....Beverley.

Certificate of the Royal College of Surgeons of England.

Dawson, William ....Kennington.

Certificates of the University of Cambridge.

Griffith, Matthew Henry........Weston-super-Mare.
Harrison, James Hughes..........Sheffield.

Certificates of the University of London.

Randall, Frank William...........Southampton.
Ransom, Francis ....Hitchin.

Certificate of the University of Oxford.

Drew, Henry William ....Southwark.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

A meeting of this Society was held on Thursday, June 20; Dr. Gladstone, President, in the chair.

The minutes of the preceding meeting were read and confirmed. The following gentlemen were duly elected Fellows of the Society:—E. R. Budden, C. T. Macadam, W. R. Criper.

The eleven following papers were read—

Contributions to the History of the Naphthalene Series. No. II. β-naphthaquinone. By J. STENHOUSE and C. E. GROVES. In a previous paper the authors mentioned that nitroso-β-naphthol when converted into the corresponding amido-naphthol and then submitted to oxidation, yielded a crystalline compound of the nature of a quinone; this substance was named β-naphtha-quinone. The authors have obtained by acting on this body in a state of purity with nitric acid sp. gr. 1·2, red crystals melting at 158°. This crystalline substance has the composition $C_{10}H_5(NO_2)O_2$, mononitric β-naphthaquinone; it is reduced by hydriodic or sulphurous acid, forming two new substances probably the corresponding nitrohydroquinone and the amidohydroquinone. By treating β-naphthaquinone with dilute sulphuric acid a dark coloured compound was obtained, which on reduction yielded white acicular crystals, and on oxidation orange-coloured prisms, the three substances evidently standing in the same relations with one another as green quinhydrone, quinol or hydroquinone and quinone in the benzene series. The new quinone has the formula $C_{20}H_{10}O_4$, which the authors substantiated by analysis and quantitative experiment; it is very stable. The hydroquinone obtained by reducing the quinone forms colourless needles, oxidizing with comparative ease, and becoming dark coloured on exposure to the air, its formula is $C_{20}H_{10}(OH)_4$; it may be regarded as a tetrahydric alcohol of the hydroquinone or quinol species derived from α-dinaphthyl, $C_{10}H_7C_{10}H_7$, by the displacement of four hydrogen atoms and four OH groups and is a member of a new class of bodies, the diquinols. The authors propose to call it dinaphthyldiquinol and its quinone dinaphthyldiquinone. Benzoquinone and α-naphthaquinone also yield diquinones and diquinols, which the authors are studying.

On Pyrotritartaric and Carbopyrotritartaric Acids. By G. HARROW. The author has saponified diacetosuccinic ether with dilute sulphuric acid; he obtained a crystalline substance mixed with an oil. The oil was separated by distillation and dried; it boiled 208—209°, had the formula $C_9H_{12}O_3$, and was decomposed by dilute soda into alcohol, and an acid $C_7H_8O_3$ melting at 135°; this acid proved to be the pyrotritartaric acid of Wislicenus and Stadnicki (uvic acid of Böttinger). The silver and sodium salts were prepared and studied. The crystalline substance consisted of an acid melting at 230° C., crystallizing from hot water in long needles and having the formula $C_8H_8O_5$, and an ether of this acid, crystallizing in silky plates, which melts at 81°—82°. The monobasic and dibasic silver and sodium salts of this acid were prepared, it proved to be carbouvic or carbopyrotritartaric acid. On heating dry carbouvic acid CO_2 was evolved, uvic acid being left. The reactions which occur on saponifying diacetosuccinic acid are then—

(1) $C_{12}H_{18}O_6+H_2O=C_8H_8O_5+2C_2H_5HO$;
(2) $C_{12}H_{18}O_6+H_2O=C_9H_{12}O_3+CO_2+C_2H_5HO+H_2O.$

In conclusion the author discusses the constitution of carbouvic and uvic acids.

On the Action of Alkaline Hypobromite on Ammonium Salts, Urea and Oxamide. By W. FOSTER. In the first part of the paper the author gives a *résumé* of our knowledge as to the action of hypobromite on ammonium salts and urea, detailing some experiments of his own which, in the main, confirm the results of previous observers, the reactions varying to a certain extent with the strength of the hypobromite solution; he then proceeds to investigate the action of alkaline hypobromite on oxamide. As a mean result, he finds that oxamide gives off 74·87 per cent. of its total nitrogen when it is acted on by the ordinary hypobromite solution. He then endeavoured to ascertain the precise condition of the suppressed nitrogen, but without complete success; the experimental evidence is in favour of the nitrogen remaining as a nitrate, whilst general considerations point to the formation of cyanate. The author suggests as the formula of oxamide

$$C_4\left\{\begin{array}{l}(NH)_3\\ NHHO.\\ (HO)_3\end{array}\right.$$

Action of the Halogens at High Temperatures on Metallic Oxides. By C. F. CROSS and S. SEGUIRA. The authors have investigated the action of the halogens on lead oxides by heating these bodies (1) in a mixture of the halogen and air; (2) in the pure halogen. The products with bromine and chlorine were mostly liquid at the temperature employed; with iodine heavy infusible powders were formed. The authors draw attention to the constancy of the percentage of residual oxygen in the product of each series of reactions, thus:—

	Pure Halogen.		Halogen and Air.	Ratio.
I compounds .	4·12	% of	5·63 %	1 : 1·3
Br ,, .	1·43	residual	2·14	1 : 1·5
Cl ,, .	0·76	oxygen.	1·28	1 : 1·8

The action of iodine in the presence of oxygen upon oxides and carbonates of the alkaline earth-metals is interesting, as instead of (as with lead) oxyiodides being formed periodates are produced; thus calcium and barium periodates were obtained. In the absence of oxygen this fixation of iodine by the alkaline earths does not take place.

On Manganese Tetrachloride. By W. W. FISHER. The author has studied the chlorides formed when binoxide of manganese is dissolved in strong hydrochloric acid at the ordinary temperature, also the action of hydrochloric acid on red oxide of manganese. The results point to the conclusion that the oxides of manganese higher in degree than the protoxide when treated with an excess of strong hydrochloric acid give brown liquids containing a highly chlorinated manganese compound, probably $MnCl_4$, which is readily resolved into manganous chloride and free chlorine, and that on dilution with water hydrated manganese binoxide is precipitated in each instance. Since a large excess of hydrochloric acid or alkaline chlorides seems to render $MnCl_4$ more stable it is probable that this body only exists in a combination analogous to chloroplatinic acid.

On Salts of Nitrous Oxide. By A. E. MENKE.—The author has prepared the sodium salt of nitrous oxide by fusing nitrate of soda with iron filings. Zinc was substituted for iron, but the salt was not formed. The sodium salt is very soluble in water, and crystallizes in white needles; it has the composition $NaNO, 3H_2O$. The silver salt previously obtained by Divers was prepared, and its composition confirmed. Details of the preparation and the reaction of the sodium salt are given.

Notes on Madder Colouring Matters. By E. SCHUNCK and H. ROEMER.—The authors have prepared some quantity of munjistin from 100 lbs. of munjeet. In order to remove any doubt as to the identity of the colouring matter obtained from commercial purpurin with munjistin, they have examined the latter substance with great care. It was obtained in golden yellow scales, melting at 231° C.; it had the same properties and composition as purpuroxanthic acid. Acetic anhydride forms when boiled with munjistin an unstable compound, melting at about 160°. Bromine forms orange-yellow needles, melting at 231°; its composition was that of dibrompurpuroxanthin, the carboxyl group having been eliminated. Boiling potash forms with munjistin purpurin, and ammonia converts it into purpurinamide. By the action of fuming nitric acid orange coloured needles, melting at 251°, very similar to but readily distinguished by their behaviour to ammonium acetate from dinitropurpuroxanthin.

On the Occlusion of Hydrogen by Copper. By G. S. JOHNSON.—The author has made an elaborate series of experiments to determine the causes of the discrepant results obtained by previous experimenters, Graham, Thudichum, etc. The principal facts established are the following: when metallic copper is repeatedly oxidized and reduced by hydrogen in the same tube, progressively decreasing quantities of hydrogen are occluded. Thus, 37 grm. of copper wire gave, at first, 0·010 grm. water, finally, ·004, until a constant minimum is reached. The variation in the quantity occluded does not depend altogether on the physical condition of the surface of the metal. At a red heat copper oxide occludes carbonic anhydride, and will not part with that gas in air at the temperature of occlusion, or when reduced at a red heat by hydrogen. By fusion of the oxide the carbonic anhydride is evolved. In conclusion, the author states that the discrepancy between the results obtained by different experimenters is explained: 1st. By the fact that hydrogenized copper retains nearly all its hydrogen in vacuo at a red heat; 2nd. That the same metal occludes varying quantities of hydrogen under different conditions. The amount occluded is, however, in most cases sufficient to introduce a serious error in organic analysis. The author recommends the plan of Dr. Thudichum for obviating this error, viz., ignition of the reduced metal in CO_2 for some time before use. The pure spongy metal reduced from precipitated oxide might be substituted for the commercial copper.

On the Role played by Carbon in Reducing the Sulphates of the Alkalies. By J. MACTEAR. In 1839, Liebig suggested a process for the manufacture of carbonates founded on a discovery of Gay Lussac, that caustic potash heated with sawdust evolves pure hydrogen, potassic oxalate and acetate being formed; by heating to redness these two salts are converted into carbonates. Liebig substituted sodium sulphide for caustic potash, and found that a similar reaction took place. The process, however, failed commercially. The author has investigated in detail the action of various quantities of carbon on the alkaline sulphates at various temperatures. When sulphate of soda is mixed with an excess of carbon and exposed to a temperature considerably above red heat, out of contact with air, the reaction is:—

$$Na_2SO_4 + 4C = Na_2S + 4CO.$$

When a temperature of dull redness, 1150°–1300° F. is used, the action is—

$$3Na_2SO_4 + 6C = Na_2CO_3 + Na_2S_2 + Na_2S + 4CO_2 + CO.$$

The decomposition of sulphate of potash is similar, but takes place at a lower temperature.

On the Action of Ethyl Chlorcarbonate on some Oxygenated Haloid Compounds of the Fatty Series. By O'NEILL F. KELLY.—Some years ago Wurtz effected the synthesis of several aromatic monobasic acids by submitting a mixture of a monochlor- or monobrominated hydrocarbon and ethylchlor-carbonate to the action of sodium amalgam, $CO·OC_2H_5$ being substituted for the haloid element. The author endeavoured to effect this substitution in di- and tri-substituted haloid hydrocarbons in the fatty series with the following results:—55 grm. of ethylchlorcarbonate and 54 grm. of allylalcoholdibromide were heated with 2·4 kilos. of sodium amalgam for five hours, in a flask to which a reversed condenser was attached. The evolved gases after passing through bromine, were collected over water, and found to consist, at first, of CO and CO_2, but finally of CO_2. Ethylcarbonate, propylenedibromide, and a trace of allyl alcohol were the products of this reaction. Glycerindichlorhydrin and ethylchlorcarbonate were the next substances experimented with. After heating twelve hours with sodium amalgam, the flask was cooled and water added, and the oil which separated washed and dried. On distillation one-third came over between 100°–190°, and consisted of $CO\left\{\begin{matrix}Cl\\OC_2H_5\end{matrix}\right\}, CO\left\{OC_2H_5\right\}_2$, and $C_3H_5OHCl_2$. The portion which came over between 190°–240° after repeated fractionation boiled 225°–230°. It consisted of $C_6H_{10}Cl_2O_3$; some $C_2H_4Br_2$ was also obtained. No allylalcohol was formed. The author has confirmed the results of Hübner and Müller that dichlorhydrin is converted by sodium amalgam, at 100° C., into allylalcohol, epichlorhydrin and ethylchlorcarbonate. These substances when heated with sodium amalgam yielded $CO(OC_2H_5)_2$, boiling at 126°, and a mobile liquid, with a bitter pungent taste, boiling 145°–150°, having the composition, $C_6H_{10}N_3$, yielding, on saponification, allylalcohol.

Laboratory Notes. By H. E. ARMSTRONG.

The Society then adjourned over the recess.

ROYAL INSTITUTION OF GREAT BRITAIN.

THE DETERIORATION OF OIL PAINTINGS.*

BY R. LIEBREICH, M.D., M.R.C.S., M.R.I.

(*Concluded from page* 1035).

Oil and fat are bodies consisting of carbon, hydrogen and oxygen. They may be considered as salts in which glycerine, as a basis, is combined with different acids, stearic acid, palmic acid, oleic acid. If oil is exposed to the air, it changes; certain kinds of oil remain liquid; others become thicker and darker, and are gradually transformed into hard and opaque bodies. The drying of oils is based upon a chemical process, during which the oil oxidizes by absorbing oxygen from the air, and combining a part of it with carbon to form carbonic acid, and another part with hydrogen to form water. The different oils dry with different rapidity, but this rapidity may be modified by the presence of certain substances, or by certain treatment. Linseed oil, for instance, according to the way in which it has been pressed out of the seed, contains more or less mucilaginous substances. These latter impede the drying of the oil, and have therefore to be removed by a refining process. If linseed oil in a shallow vessel is exposed to the air and light, especially to a green light, it soon begins to dry, and is transformed first into a kind of varnish and gradually into a solid opaque substance. The drying may be quickened by boiling, and more particularly by the addition of lead, zinc, or manganese. In this way a quick-drying oil varnish may be prepared and used as a siccative. It follows that there are certain substances which impede the drying of oils, and others which facilitate it. Amongst the pigments are some which belong to this category of bodies, white-lead, zinc-white, minium, vermilion, for instance, facilitate the drying; others, such as ivory-black, bitumen, madder-lake, will impede it. Supposing now we should add to each of the different pigments the same quantity of oil, the drying of it would progress at different rates. But in reality

* Lecture delivered at the Royal Institution of Great Britain, Friday March 1, 1878.

this difference is very greatly increased by the fact that the different pigments require very different quantities of oil, in order to be ground to the consistency requisite for painting.

Pettenkofer quotes the following figures, given to him by one of the colour manufacturers :—

100 parts (weight)	White-lead .	require	12	parts of oil.
" "	Zinc-white .	"	14	"
" "	Green chrome	"	15	"
" "	Chrome-yellow	"	19	"
" "	Vermilion .	"	25	"
" "	Light red .	"	31	"
" "	Madder-lake .	"	62	"
" "	Yellow ochre.	"	66	"
" "	Light ochre .	"	72	"
" "	Camel's brown	"	75	"
" "	Brown manganese	"	87	"
" "	Terre verte .	"	100	"
" "	Parisian-blue.	"	106	"
" "	Burnt terre verte	"	112	"
" "	Berlin-blue .	"	112	"
" "	Ivory-black .	"	112	"
" "	Cobalt . . .	"	125	"
" "	Florentine-brown	"	150	"
" "	Burnt terra sienna	"	181	"
" "	Raw terra sienna	"	240	"

According to this table a hundred parts of the quick-drying white-lead are ground with twelve parts of oil, and on the other hand, the slow-drying ivory-black requires one hundred and twelve parts of oil.

It is very important that artists should have an exact knowledge of these matters. But it seems to me that they are insufficiently known to most of them. All, of course, know perfectly how different the drying quality of different colours is. But that these different colours introduce into the picture so different a quantity of oil, and how large this quantity is in the colours they buy, and further, that the oil as well as the mediums or siccatives they add to dry the colours are gradually transformed into a caoutchouc-like opaque substance, which envelops and darkens the pigments; and moreover, that the oil undergoes—not in the beginning, but much later on when it is already completely dry—changes of volume, and so impairs the continuity of the picture,—all this is not sufficiently known. Otherwise, the custom of painting with the ordinary oil colours to be bought at any colourman's, would not have been going on for nearly a hundred years in spite of all the clearly shown evil results; results due, chiefly, to the principal enemy of oil painting, that is to say, the oil.

That the masters of the 15th and 16th centuries did not use colours prepared in this way, you may consider as absolutely certain; and if we hear the lost secret spoken of, and if we read that the pupils of the old masters had to pledge themselves to keep the secret, we may be sure that it is neither the method of painting nor the pigment used for it which is concerned in that secret, but exclusively the way of preparing the colours. The preparation was a very complicated one, varying with the different pigments; and we know that the pupils passed six years, that is half of the apprenticeship, in grinding the colours for the master.

And therefore it is to this very point that everyone who wishes to study the method of the old masters must first of all direct his attention. I too, was led, by the study of this question, to analyse and restore old pictures. The possibility of making such analysis we owe to the relation between the old masters and their pupils. Of course we could not dissect or chemically analyse works of Titian or Raphael. But fortunately the pupils painted with the same material and by the same method as the masters, and thousands of pictures by the pupils, well preserved or in different stages of decay, may be easily procured.

I have myself from among a very great number of such pictures, selected about one hundred specimens, part of which I have brought before you. As their artistic value is not, as you perceive, of the highest description, we need not feel any scruple in experimenting upon or even destroying them, if we can thereby gain any valuable information.

If we compare the pictures of the Italian and Dutch schools of the 15th, 16th, and 17th centuries, with those of the French and English schools of the last hundred years, we are struck by the great difference in the nature of their diseases. We may divide those diseases into constitutional ones—that is to say, such as are based on the method and the material used for painting, and into those produced by external influences.

The Dutch pictures of the 15th, 16th, and 17th centuries, and the Italian pictures of the 15th and 16th centuries, seem to me perfectly free from constitutional diseases. It is only in the 17th century that the Italian pictures show a special constitutional alteration, caused by the practice of the Bologna school.

The pictures of the last hundred years of the French school, of a part of the English school, and some painters of other schools, have been attacked by a constitutional disease perfectly defined and characteristic of this period.

Among external influences injurious to oil painting, we have to consider dampness, heat, bad air, dust, smoke, mechanical injuries, and last, not least, the destructive, or "altering" hand of the picture-restorer.

Pettenkofer's scientific researches first clearly defined the influence of humidity on oil paintings, showing that it produced a discontinuity of the molecules of the vehicle and the resinous substances. As glass, when pulverized and thereby mixed with air, loses its transparency, and water, when mixed with oil, becomes of a milky aspect, so the oily and resinous substances contained in paintings, will become dim as soon as air penetrates between their particles. The picture thus assumes a greyish dim appearance, and the pigments seem to have been fading. That this is not really the case has been proved by the influence of a process invented by Pettenkofer, which he calls regeneration. In a flat box the picture is exposed to air impregnated with alcohol. Of this latter, the resinous elements of the picture absorb a certain quantity, swell and fill up the interstices between the separated particles so as to reunite them into an optically homogeneous, transparent substance.

The alcohol does not affect in the same way the hardened oil. If the interstices between its particles are not filled up by the swelling resin, it becomes necessary to introduce a new substance into the picture, and this is called nourishing a picture.

Pettenkofer has the great merit of having clearly proved that the nourishing of a picture with oils, as the custom was formerly, and still is to some degree, is a very objectionable proceeding, as it has the effect of darkening the colours for ever. He recommends, instead of oil, balsam of copaiva, which has become since an invaluable means for preserving and restoring oil paintings, and will be more and more extensively used.

I have frequently applied Pettenkofer's method, and with very beneficial effect; but whenever I mentioned it to professional picture-restorers, here as well as on the Continent, I always found them to reject it, either *à priori*, or after experiments incorrectly made.

In Munich, it seems, the pictures of all periods and of all schools have had to suffer under local influences and through the changes in the humidity of the air. This accounts for Pettenkofer having principally described this, so to say, endemical disease. In other galleries this affection does not appear so frequently, and Pettenkofer's method, therefore, will not find everywhere the same extensive application as at Munich. I think, however, that with some modifications it may be employed against some other alterations. I have, for instance, found it efficacious with paintings which had been injured by exposure to great heat. I shall show you a small picture which had been hanging for a long time so near a gas flame that it was almost completely scaling off, and so entirely faded that it scarcely looked like an oil painting at all. In that state it was exposed to alcoholized air, then nourished with balsam, and its back slightly varnished; and the scales starting from the canvas were refixed by pressure. And now it appears fresh in colour, firm in substance, and perfectly smooth on its surface. The old, cracked varnish, melted together by the alcohol, looks as if fresh laid on.

Humidity sometimes favours the development of fungus. The round, black, small spots which pass through the canvas and the painting of these two pictures are produced by the same little plant which Professor Tyndall showed you when he spoke on the highly interesting subject of spontaneous generation.

Oil and water, so injurious to oil paintings, enter both into the material used for lining. Anxious to exclude these sources of danger, and to simplify the whole process, I have endeavoured to replace it by a new method which I shall submit to you this evening.

How paintings may be disfigured by restorers you see in this picture, which was renovated with oil colours according to the practice only abandoned about thirty years ago, when it was advantageously replaced by the use of varnish colours.

The amount of external injury oil paintings sometimes endure and stand is perfectly amazing. Pictures in the course of centuries, during the destructive fury of wars and revolutions, may have been torn out of their frames, rescued from below the ruins of burned monasteries, may subsequently have passed from one bric-à-brac shop to another, where they have been piled up, to be pulled about at each new inspection, and literally trodden under foot, whereby they have finally been reduced to a state of colourless, greyish, or black rags. Still such pictures may not unfrequently be awakened, as it were, to new life, to their original brilliancy of colour; if, with all necessary care, their injured limbs are put together again, their wounds are healed, and fresh nourishment, air, and thorough cleansing, are administered to their lacerated bodies.

A sound constitution is, of course, a necessary condition for obtaining any such result, without it we can only obtain a partial cure. We see this with reference to the Bologna school of the 17th century. The pictures which you see here are instances of this. From the state of rags to which they were reduced they have passed, by appropriate treatment, into the state of firm, even, well-conditioned, and clean pictures. The constitutional alteration characteristic of their time and school, however, could not be cured. You will, therefore, perceive that the contrast is too great between light and shade, that the half tones are too weak and that the glazings spread on dark ground, which certainly existed formerly, have been destroyed by the growing of bolus and umber of the priming. That this is not the fault of the method of restoration is clearly proved by the state in which you will find all the pictures of this school, even those best preserved in the best galleries of all countries.

The constitutional diseases of pictures belonging to the French and to the English school of the last hundred years are of still more serious nature, and much more difficult to cure. Many of them, though they were never exposed to any injury whatever, nor are likely ever to be so in our present state of civilization, cannot be guarded from premature decay in spite of all possible care with which they are kept.

The principal symptoms of their bad constitution are:—

1. Darkening of the opaque bright colours.
2. Fading of the transparent brilliant colours.
3. Darkening, and above all, cracking of the transparent dark colours.

The best opportunity to study these several appearances is given us in the Museum of the Louvre, which contains a great number of such pictures in the section occupied by the French school. I have paid particular attention to the cracks in these pictures, as I find that in shape, in size, in position, as well as in relation to the various colours, they differ distinctly from the cracks in older pictures and in those of other schools. This, of course, is of importance, not only for the explanation of the reasons which produced them, but as a symptom which, in a given case, might determine the diagnosis, whether a picture be an original or only a copy. The special characteristics of these cracks are the following:—

They are all but exclusively found in the thickly laid on transparent dark colours, and they are the deeper and the more gaping in proportion to the thickness of the layer of the colour and the extent of the dark surface. The chief cracks run parallel to the outlines of surfaces painted with bright opaque colours, such, for instance, as are used for the flesh tints, and which are more or less thickly laid on. But there is generally a slight distance between the bright colours and the cracks.

Lateral branches of these cracks pass into the white, but they do not gape, provided the white colours had been laid on directly upon the priming, and not upon a layer of dark transparent and not sufficiently dried colour.

This examination of the cracks of pictures has sometimes afforded me a peculiar insight into the practice used for the picture. In the well-known picture, for instance, by Guéricault, of "The Wreck of the Medusa," in the Gallery of the Louvre, the cracks follow exactly the outlines of the bright flesh-tints. The arm of one of the dead bodies hanging in the water is so covered by planks and water that nothing of the forearm is to be seen. It is, however, very easy to prove that originally that arm was painted in all its length, for the cracks do not only follow the outline of the visible upper arm, but also the no longer visible forearm, and all the five fingers. This proves that the fore-part of the arm and the hand were originally painted in flesh tints before they were covered over by the planks and the water painted afterwards. In Ingres's portrait of Cherubini, the face of the latter is beautifully preserved, whilst that of the Muse, as well as her drapery, is covered with cracks. In the depth of the cracks of the white drapery, an intense blue tint is to be seen. Mr. Henri Lehmann, of Paris, the favourite pupil of Ingres, who knows the history of this picture as an eye-witness, and whom I consulted about this very striking appearance, gave me the following information:—Ingres painted the head of Cherubini in Paris, and then took it with him to Rome. There it was pieced into a new canvas and lined. Then the Muse was painted, and before the colours were perfectly dry, another model was chosen, and a new Muse painted over the old one. The colour of the drapery was likewise altered, and this explains the cracks in the white colour, and explains also why the blue appears in the depth of the cracks of the drapery.

Among the English artists of the last hundred years, some have painted with the same material and by the same process as their French contemporaries, and consequently with the same unfortunate results. Others avoided these by using the same material with more precautions. Others, again, and among them Sir Joshua Reynolds, have in their different works followed various practices, and consequently had varied results. Thus some of Sir Joshua's pictures have kept perfectly sound. Others are cracked in the characteristic way just mentioned Others, again, are cracked in an absolutely irregular way. We can easily form an idea of it, if we read in his 'Diary Notes,' for instance, the way in which he painted the portrait of Miss Kirkman, which he began with whiting and gum tragacanth, then covered it successively with wax, then white of eggs, and then varnished it.

The study of the alterations already fully developed in pictures painted within the last hundred years only, and their comparison with the works of the old masters, would suggest the following rules for the process of painting:—

1. The oil should in all colours be reduced to a minimum

and under no form should more of it than absolutely necessary be introduced into a picture.

2. All transparent colours which dry very slowly, should be ground not with oil at all, but with a resinous vehicle.

3. No colour should be put on any part of a picture which is not yet perfectly dry; and, above all, never a quick-drying colour upon a slowly drying one, which is not yet perfectly dry.

4. White and other quick-drying opaque colours may be put on thickly. On the contrary, transparent and slowly drying colours should always be put on in thin layers.

If the effect of a thick layer of these latter is required, it must be produced by laying one thin layer over another, taking care to have one completely dry before the next is laid on. If transparent colours are mixed with sufficient quantity of white-lead, they may be treated like opaque ones.

We come now to the last layer of the picture, to that one which is spread over its surface in order to equalize optical irregularities, and to protect it at the same time from the air. I mean the varnish.

The varnish may crack or get dim, then it should be treated by Pettenkofer's method; but it may become dark yellow, brown and dirty, and so hide the picture that it becomes necessary to take it off and to replace it by a thin layer of new varnish. It is here that picture restorers, or we may say picture cleaners, display their beneficial skill, and also their very destructive activity.

If a picture is throughout painted in oil, if its substance has remained sound and even, and varnished with an easily soluble mastich or dammar varnish, then there will be neither difficulty nor danger in removing the varnish. This can, in such a case, be done either by a dry process, that is, by rubbing the surface with the tips of the fingers, and thus reducing the varnish by degrees to a fine dust, or by dissolving the varnish by application of liquids, which, when brought only for a short time into contact with the oil painting, will not endanger it. We have, however, seen that the works of the old masters are not painted with oil colours like those used by modern painters, but, on the contrary, that certain pigments, and especially the transparent colours used for glazing, were ground only with resinous substances. These latter have, in the course of time, been so thoroughly united with the layer of varnish spread over the surface of the picture, that there no longer exists any decided limit between the picture and the varnish. It is in such pictures that a great amount of experience, and knowledge of the process used for the picture, as well as precaution, are required in order to take away from the varnish as much only as is indispensable, and without interfering with the picture itself. Numberless works of art have been irreparably injured by restorers, who, in their eagerness to remove dirt and varnish, attacked the painting itself. They then destroyed just that last finishing touch of the painting, without which it is no longer a masterpiece.

The difficulty and danger are much greater in cleaning those pictures which have not been varnished with the ordinary easily-dissolved mastic or dammar varnish, but have been painted over with oil, oil-varnish, or oleo-resinous varnish. It seems incredible that these substances should ever be used for such purposes; it is, however, a fact that there are still people who fancy that it will contribute to the good preservation of their pictures to brush from time to time a little of those liquids over their surface. They recognize too late that the varnish becomes more and more dark, of a brownish colour, and opaque. If such varnish has afterwards to be removed, then we meet with the great difficulty, that this can be done only with substances which would just as easily dissolve the whole picture as the hardened layers spread over it.

This shows what can be the value of those universal remedies which from time to time appear, and are praised for the innocuous way in which pictures by their means may be cleaned.

There is at this moment a great discussion going on in Italy about Luporini's method. Luporini is a painter and picture restorer in Pisa, who believes himself to have invented a new means of cleaning pictures without any danger. Some months ago, in Florence, I examined a large number of pictures cleaned by him. Those of the Gallery of St. Donato, belonging to Prince Demidoff, mostly Flemish and Dutch landscapes, are cleaned very well and without any injury to the painting. On the contrary, the St. John, by Andrea del Sarto, one of the finest pictures of the Palazzo Pitti, I found very much altered by the restoration of Luporini. I had studied that picture very closely the year before, and should now sooner believe it to be a modern copy than the cleaned original. It has lost all softness of outline, and the characteristic expression of the face. The change in the flesh tints can scarcely be explained otherwise but by an entire removal of the glazing.

I think it is taking a heavy responsibility to allow a new experiment to be tried upon such an invaluable work of art. Even private persons, who are fortunate enough to be in possession of such treasures, ought to feel responsible for the good preservation of masterpieces, which are, it is true, their material property, but which intellectually belong to the whole civilized world of the present and of the future.

Parliamentary and Law Proceedings.

Arsenical Violet Powder.

On Thursday, June 20, Mr. Humphreys, coroner for the Eastern Division of Middlesex, resumed an inquiry as to the cause of the death of the infant child of Francis and Mary Ann Ringrose, which was alleged to have been caused by the use of violet powder containing arsenic. Mr. Poland watched the case on behalf of the Treasury; and Mr. H. H. Wells appeared for Mr. King.

The first witness called was Mrs. Ringrose, the mother of the child, who deposed to having purchased some violet powder of Mr. Kidd, a general shopkeeper, of Wellington Street, Kingsland, three months before her confinement. She saw the powder applied to the child the day after its birth; but in consequence of the nurse having read of the case of poisoning at Loughton, it was then discontinued. The child's flesh turned very red, and on the second day sores broke out all over it. Her second child had died in the same way; this was her third.

Mr. Kidd, from whom the powder had been purchased, identified a similar packet as supplied by Mr. King, the manufacturer of the powder which is alleged to have caused the deaths at Epping. Mr. King's traveller had called soon after the Epping case and taken away the remainder of the stock, and said that Mr. King would replace it.

Thomas Walton, traveller for Mr. King, said that in consequence of a letter received from the Solicitor of the Treasury his employer had directed him to bring in all the powder now held in stock by his customers. He had been in Mr. King's employment for eight years, and had gone through every department in the factory. The violet powder used to be composed of starch, flour, orris root, violet perfume, and essence of roses; but, in consequence of a subsequent increase in the market value of the article, two qualities had been made, and in the poorer quality half proportions of starch, flour, and terra alba were used as the substance of the powder. All the ingredients came in packages from the wholesale druggists, and were duly labelled. He had never seen any white arsenic in the establishment, and knew that during the time he had been employed there it had never been used for anything manufactured on the premises. Indeed, Mr. King, in speaking of the circumstance, said he had never seen white arsenic in his life, and did not know what it was like. At this point the inquest was adjourned, the analysis not having been completed.

On the same day in the Queen's Bench Division of the High Court of Justice (Sittings in Banco before the Lord Chief Justice and Justices Mellor and Lush), Mr. F. Turner applied on behalf of the defendant for a rule *nisi*, under what is known as Palmer's Act, to remove the indictment found against the defendant for manslaughter from Chelmsford to the Central Criminal Court for trial. The case was known as "the violet powder" case, and he moved for the removal of the trial on the ground of prejudice which prevailed against the defendant throughout the whole of Essex and that expense would be saved by a trial in London, where nearly all of the witnesses to be examined reside. The defendant, in his affidavits swore that for the last fifteen years he had been a manufacturer of violet powder, and that he was altogether ignorant of the fact that arsenic got mixed up with the violet powder recently manufactured by him until he received a letter from the Treasury to that effect, whereupon he withdrew from his customers all the powder they had in stock. He also positively swore that he had never dealt in arsenic, and that he was wholly ignorant that arsenic was ever on his premises. He was only able to account for the presence of arsenic in the violet powder in question by supposing that one of the wholesale houses with which he dealt had sent him arsenic in mistake for white starch powder.

The Court granted a rule *nisi*.

VIOLET POWDER.—PROSECUTIONS UNDER THE SALE OF FOOD AND DRUGS ACT.

Before the Hyde magistrates on the 24th inst., Alfred Bird and Sons, manufacturing chemists, of Birmingham, were charged with selling adulterated violet powder. The case was brought forward by Major Edwards, deputy chief constable of Cheshire, who had caused samples of violet powder to be purchased from various shopkeepers in the Hyde petty sessional division. One sample was procured from Dukinfield, which had been supplied by the defendants, and on being analysed by Mr. Carter Bell, of Manchester, it was found to contain 8 per cent. of mineral matter. Five other samples examined at the same time were found to be pure. Mr. Tanner, of Birmingham, appeared for the defendants, and the firm produced a certificate from Professor Redwood, of London, professor of chemistry of the Pharmaceutical Society of Great Britain, stating that he had analysed the violet powder manufactured by Messrs. Bird and Sons, and it was perfectly pure and harmless. It was contended that there were as many kinds of violet powder as there were makers, and that the magistrates could not say that all should be made of the same constituents; it was only necessary that it should be harmless. The Bench took this view, and dismissed the case.—From the *Manchester Guardian*.

Dispensing Memoranda.

[117]. TINCT. CARDAMOMI.—I see in last week's Journal two answers to Mr. Barnes's query concerning Tinct. Cardamomi. I fail to see the force of G. T. Stephens's remark, that the person who uses Tinct. Cardam. *Co.* knows very little of dispensing. As far as my little knowledge of dispensing and pharmacy serves me, I know of no such preparation in use as Tinct. Cardam. *Simp.*; nor has there been such a preparation, either in the B.P. or P.L. since about 1851. I guess Mr. G. T. Stephens looks to Beasley for his authority; there he will find a preparation of that kind dated 1836, P.L., but we have placed that antiquated Pharmacopœia on the shelf long ago, and never refer to it, unless our attention is directed to it by the initial letters P.L. Now I will ask Mr. G. T. Stephens a question. When Tinct. Rhei *Co.* is ordered, what does he give in that instance? I presume he runs back to the London Pharmacopœia, or makes an egregious mistake (?) by putting in Tinct. Rhei of the present B.P. Again, Pil. Rhei and Tinct. Gentianæ, I find no mention of whatever, but am frequently called upon to dispense them. Certainly Mr. Tenens's suggestion will be approved by all who understand anything at all of dispensing.

"Οχθαί."

[117]. TINCT. CARDAM.—In answer to J. W. Barnes, I should treat Tinct. Card. in the same way that I have treated Ferri Cit. I am inclined to think that although some medical men intend Tinct. Card. Simp. and Ferri Cit., etc., many, if asked, would say they intended Tinct. Card. Co. and Ferri Am. Cit. In these and similar cases the only plan which I can suggest, and the one which I follow, is to translate the prescription literally. By so doing many small doubts will be at once decided. Of course a dispenser must always use a certain amount of discretion.

F. D.

[118]. PULV. SCAMMON.—In answer to "Borgue" Pulv. Gum. Scammon. should undoubtedly be used when Pulv. Scam. is ordered. F. D.

[118]. PULV. SCAMMONII.—I think "Borgue" may satisfy his curiosity by referring to his B. P. for Scammonium.

GEO. F. H. BARTLETT.

[120]. W. F. C. I should use the Ferri Am. Cit. and dissolve by gently warming. The mixture will not be clear. F. D.

[122]. Will any reader tell me how to dispense the following, and what are the chemical changes produced?—

℞ Ferri et Quin. Cit. . . . . . ʒiss.
Lithiæ Citrat. . . . . . . ʒiij.
Pot. Iodid. . . . . ʒij.
Sp. Chlorof. . . . . ʒvi.
Aq. Puræ. . . . . . . ad ℥viii.
Misce. B. SAWYER.

[123]. Does the Oil of Bay Leaf, from the sweet bay (*Laurus nobilis*), contain traces of hydrocyanic acid? I am told that it does. As I am unable to confirm the assertion, I shall be glad of your opinion.

J. BURT.

[124]. The following prescription was brought to me to be dispensed a few days since; perhaps some one may suggest the best method of mixing; also if they do not consider it a large dose of phosphorus.

℞ Phosphori Pur. . . . . gr. ¼.
Ext. Hyoscyam. . . . . gr. ij.
M. ft. pil. Misce ix.
Capt. j. ter die.
Weston-super-Mare. C. GRIFFITH.

[125]. Will any reader say how the following prescription should be sent out?—

℞ Aloin . . . . gr. vj
Jalapin . . . . gr. vj.
Hyd. Subchlor. . . . . . . gr. vj.
Pil. Rhei Co. . . . . gr. xxx.
Div. in pil. argent. involut. quarum duo p. s. p. r. n.
Canterbury. A. W. G.

[126]. Will any reader give the best way of making the following pessaries?—

℞ Ergotina,
Acid. Tannici . . . . āā gr. x.
Ol. Theobroma, q. s.
Ut fiat pessaria. Mitte xii.

I always use a little wax and lard in the preparation of pessaries, and should like to know if it is objectionable. DISPENSER.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

INJURIOUS (?) VIOLET POWDER.

Sir,—A sample of violet powder bearing the trade mark, "A steamer over a globe" has been placed in my hands for analysis. Seeing an advertisement in your last week's issue containing a certificate from Professor Redwood which certifies that a violet powder analysed by him, bearing the same trade mark, does not contain anything injurious to the skin or unsuited for the purpose for which it is intended to be used, viz., as an absorbent powder, I cannot help thinking there must be two preparations with the same trade mark; I therefore append the analysis of my sample for the benefit of the trade generally, as I fear such a preparation must be injurious to the tender skin of young infants, and especially to excoriated surfaces—

	Per cent.
Hydrated Sulphate of Calcium . . .	83·9
Silicate of Magnesium (French Chalk) .	13·78
Perfume, Moisture, &c.	2·32
	100·00

I enclose part of cover bearing the trade mark.

JAS. BAYNES, Jun., F.C.S., F.R.M.S.
Borough Analyst for Hull.

Analytical Laboratory, Royal Chambers,
Scale Lane, Hull, June 12, 1878.

[*** The publication of Mr. Baynes's letter has been postponed for the purpose of inquiry, and in order that no injustice should be done to those interested in the article referred to.—ED. PHARM. JOURN.]

THE ADMISSION OF WOMEN TO MEMBERSHIP.

Sir,—I quite agree with Mr. Vizer, that all the members of the Society should be consulted, and that at once, on this important matter, for if the new council had admitted the two ladies last Wednesday I certainly should have considered the action very unjust to the members. The council does not consist of delegates, but when a very important question is referred by them to the general meeting for decision it should be morally binding on the new council. The dispute about the numbers shows what a strong feeling there is when wishes are worked into facts and honestly believed.

History repeats itself. Two or three women have danced before us and are promised the half of our kingdom.

It is a great pity the question has ever been raised, but medical men and chemists should be specially careful to what extent they encourage the higher education of women.

It is, I believe, pretty generally conceded the very important part women are called upon to take in continuing the species is but too often of itself more than their constitutions will bear, and if to that be added a highly cultured brain, voracious as it is for blood, few constitutions would bear the double strain.

I tremble for the future of our race when our placid mothers with high moral sense and equable minds shall give place to the blue stocking variety, or the weakly physique of the learned prude.

I may be wrong; woman may have a potential energy unknown to me; but I have seen enough at least to say, we must move in these matters with extreme caution.

I do hope, for the women's sake, the Society will not encourage them by admission to membership; the question has divided a fairly united society, and the sooner it is finally settled the better it will be for us all.

GEORGE MEE.

79, *Grosvenor Road, Highbury New Park, N.*
June 8, 1878.

Sir,—I must ask the favour of a few lines' space to correct the statement of Mr. Linford in last week's Journal, in which he says that "you propose the acceptance of Mr. Vizer's idea of an informal vote of the members on the question of admitting women to the membership of the Pharmaceutical Society."

Had Mr. Linford read your remarks carefully, or had he referred to my letter on page 999, he would have clearly seen that my proposal was, as understood by yourself, for a strictly formal vote to be given by members in reply to an official polling paper issued under the order of the Council. That such is the only practicable manner of ascertaining the real feeling of the Society I am convinced; anything short of such would be incomplete, unsatisfactory, and valueless.

EDWIN B. VIZER.

Belgrave House, Cliftonville, Brighton,
June 24, 1878.

"AURI SACRA FAMES!"

Sir,—I suppose the Americans would translate the above thus: "The Power of the Almighty Dollar." With regard to pharmacy I consider myself an outsider, retired, and out of date; but with regard to charges the same grievances now exist which I have known all my life when in business.

It appears to me that prices must always remain an open question. For the young pharmacist, just commencing business, to be required to maintain the high charges which are obtained by the old established chemists is absurd; indeed, I consider that our rising pharmacists ought to be a match for all the co-operative stores.

I can sympathize with Mr. G. H. Wright (see p. 918) in his customer obtaining for 8*d*. what he had charged 2*s*. 6*d*., but in this hard world such things may happen. On the same page, 918, Mr. Humpage alludes to the barber offering "to shave you for nothing," and the French proverb says, "the barber's apprentice learns to shave on the chin of a fool," but the barber would not trust his best customers to his inexperienced apprentice.

Uniformity of price is impossible. The public look shy on the young beginner, and he must wait until he obtains reputation before he can grow rich.

The late George Edwards, when he was a member of the Council of our Society, told the students that in these days of free trade they might as soon expect a slice of the moon as protection.

Your correspondent, "Hampshire," p. 863, advises chemists to put their shoulders to the wheel and not grumble, but "Sussex," p. 884, although he says pharmacy is going to grief, is so fond of his business that he would not retire on £10,000! The fox said the grapes he could not reach were sour. Yet I have heard of a retired tallow chandler on whom time hung so heavy that he offered his services to his successor, on melting days, gratuitously.

JOSEPH LEAY.

Chilcompton, Bath,
June 22, 1878.

SALE OF PATENT MEDICINES.

Sir,—I am sure that you and your readers must be almost tired of hearing the patent medicine question discussed particularly as many of the suggestions are impracticable, in fact, almost absurd.

Although I am a strong advocate for keeping up the old-fashioned prices, I do not think any benefit can be derived (possibly harm might be done) by making a stir (petitioning, as some of your correspondents have suggested). In a free country like this every man has a right to, and will, sell his goods at any price he pleases. What seems to me to be the only practicable remedy with regard to patent medicines is that which one of your correspondents suggested a short time ago, viz., not to push them by circulating counter bills, exhibiting show cards, disfiguring our windows with transparencies and letterings, but endeavour, as far as possible, to dissuade the public from patents. I have frequently found that when some customers come for a box of Professor Pillaway's pills, Chowell's balsam, and patents of that class, you can persuade them to have a bottle of mixture or box of pills, made specially to suit their individual case; and, I think, if chemists were to take a little more trouble in this respect they would do themselves—in fact, the chemists as a body—much benefit. I have also noticed that some who buy patents do so because they cannot or will not consult a medical man, and have not sufficient courage to ask a chemist's advice in an open shop, when perhaps an assistant or apprentice is present, but have only heard or read of So and So's pills being excellent; to such a word from the retailer is received with twofold delight, and they depart from your shop with a bottle of mixture or box of pills, of your own manufacture, with indeed much more satisfaction and confidence than if you had served them with the 1*s*. 1½*d*. article inquired for.

Perhaps it will not be out of place to mention here that a great many of the popular patents are prepared by non-registered chemists, and to encourage, or rather push, their sale seems to me contrary to all reasoning. Why should we, who have to work hard, diligently, and not without expense to pass the Society's examinations, help to make the bread for quacks or their heirs, who perhaps know no more about physic than the man in the moon, and who doubtless would be more at home in drawing up a puffing counter bill or advertisement? And yet these are the very men who make special terms to co-operative societies and cutting men, and are thus enabled to offer the goods at prices which the ordinary and honest chemist cannot compete with.

In conclusion, I hope some of our brethren will try the plan here suggested (although I do not suppose that they will succeed in every case), yet at the year's end should their returns not have increased their profits will most decidedly have done so.

A. H.

Croydon,
June 23, 1878.

THE BENGAL CINCHONA FEBRIFUGE.

Sir,—I beg to forward, for insertion in the *Pharmaceutical Journal*, the enclosed extract from a letter which I have received from Dr. King, the Superintendent of the Botanical Gardens at Calcutta, on the subject of the febrifuge manufactured by Mr. Wood from the cinchona bark grown in British Sikkim:—

"You will be glad to hear that the prejudices which at one time were rather strong in some quarters against the febrifuge are being rapidly overcome, and that by the Bengal doctors it is being cordially accepted as a substitute for quinine. During the financial year which ended on March 31, 1878, I disposed of 5107 lbs. of it in Bengal and of 400 lbs. in Bombay, and in view of our increased demand this year I have taken a crop of 320,000 lbs. of dry bark from the plantation during the past cold weather. There is no doubt that, in the same doses as quinine, the febrifuge is quite as efficient as quinine in the cure of fever. One great cause of the prejudice that one time existed against the medicine was that (assuming it to be weaker than quinine) it was given in very large doses, and in large doses it causes nausea just as an overdose of quinine does. In a short time I hope the febrifuge will be sold at about 12 annas (1*s*. 6*d*.) an ounce. At present it is sold at Rs. 16 *Sa*. per lb. to Government offices, and for Rs. 23 to the public."

Dr. King's letter is dated April 4, 1878, from Calcutta.

CLEMENTS R. MARKHAM.

21, *Eccleston Square, S.W.*

THE PRONUNCIATION OF LATIN.

Sir,—Every change of system is accompanied with some little confusion, and the new pronunciation of Latin entails its share of inconvenience. I suppose the schoolmaster will arrange that matter for us, and the newspaper jokes of such translations as "we kiss him (*vicissim*) in turn" will help to familiarize the mind with the change. I am afraid that schoolmasters are too much inclined to take the change piecemeal, and so students come to us, with their "c's" very properly all "k's;" but ignoring all change in the vowels. Mr. Clifford's list would be more complete with the additions that "t" is never according to the new system (and indeed according to the highest authorities in the old) pronounced like "sh," that ē, æ, and œ, are sounded like "ai" in pain, i like ee, in see, ū, as in all classic languages, like ōō in tool, and "au" as "ow" in power. We shall come round to fashion, and in this instance I believe it will be to reason as well. So far I am quite in accord with Mr. Clifford. But when he calls us who desire our students to ask for preparations in their full terms "purists" and almost sneers at us as "quibblers," am I not scientific in asking why? The reason for labelling in contractions is obvious. Either labels would be unduly enlarged, or type would be unduly contracted if it were otherwise. To take the instance given, "unguentum antimonii potassio-tartratis," would sprawl all over the jar, as it would over a prescription, where saving of time is added to economy of space, and in too many instances, as Mr. Clifford would admit, the system of contraction spares the same amount of "courage" on the part of the prescriber that is credited to the Duke of Wellington when he ventured to speak his French. All who are in any way connected with the press, or who have read advertisements of pens manufactured by a northern house, know how many the contractions are which journalists employ for the sake of economizing time and space, and in writing and printing the reasons are valid. But as a matter of speech I believe such economy, except in dog-latin, is purely a Yankee innovation, and I certainly should object to such parsimony of syllables on the part of a student. For a lesson taught very correctly, but not to be used in ordinary, would become very much like John Gilpin's belt, and might prove very inconvenient about the time of the twentieth wedding day. Knowledge that is to remain a possession must be first of all well taught, and then well drilled. But if economy of speech is to be effected, why should it be always at the expense of the "noble language"? Why not try contractions in English? We should have pot. tart. ant. oint., merc. oint., dist. wat., etc., etc. We should save four syllables by meth. sprite., and could reserve the more dignified "spirit" for the rectified article. Indeed I have asked young men to try the experiment for a day, and have generally found that they considered it preferable to give full terminations to both languages. There are too many short cuts already, which are calculated (or are so supposed) to ease the sore travail of oppressed students, and relieve them of the tedium of learning. If we teach them at the commencement that ordinary words are too long to be uttered in full, we must not be surprised if they arrive at the conclusion that the whole curriculum of a pharmacist ought to be curtailed by "cram" or any other shears available.

Mr. Clifford's letter marks progress in one direction. With greater attention to the sounds of letters, we may hope for improvement in quantity, and that if crammers are to teach the rising chemists that only a nominative and genitive case are necessary, at least all nouns will not necessarily "increase long in the genitive"; that felix and filix will not always travel *pari passu*, and that the old musty "Gradus ad Parnassum" will yet see the light of a renascence.

HENRY H. POLLARD.

Ryde, June 24, 1878.

"*Syrupus*."—*Spergula arvensis*; *Matricaria Chamomilla*; *Polygonum aviculare*, var.

T. Romans.—*Atropa Belladonna* and *Carex divulsa*.

T. Hope.—(1) *Euphrasia officinalis*. (2) *Lathyrus Nissolia*.

O. P. O.—(1) *Erigeron Canadensis*. (2) *Escallonia macrantha*. (3) *Deutzia scabra*.

P. B.—(1) *Sedum Anglicum*. (2) Some species of Epilobium; send a better specimen pressed on a piece of paper.

R. M. Summer.—Probably Messrs. Trubner, of Ludgate Hill, would supply you with the Journal referred to.

"*Nemo*."—(1) *The Veterinarian*; (2) *British Journal of Dental Science*; (3) Apply to the Principal of the Royal Veterinary College, Great College Street, Camden Town.

P. C. M.—The 'Additions' may be obtained from Mr. Kimpton, Bookseller, Holborn.

COMMUNICATIONS, LETTERS, etc., have been received from Messers. Richardson, Sampson Bros., Walker and Dalrymple, Ringaud, Ellinor, Symes, J. B. Edwards, Smith, Dr. Davy, F. J. R. Several correspondents have neglected to comply with the rule respecting anonymous communications.

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